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The messages presented in online electronic cigarette promotions and discussions: A scoping review protocol

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ABSTRACT

Introduction: Electronic cigarettes have become increasingly popular over the last ten years. These devices represent a new paradigm for tobacco control offering smokers an opportunity to inhale nicotine without inhaling tobacco smoke. To date there are no definite conclusions regarding the safety and long term health effects of electronic cigarettes, however, there is evidence that they are being marketed online as a healthier alternative to traditional cigarettes.This scoping review aims to identify and describe the breadth of messages (e.g. health, smoking-cessation and price related claims) presented in online electronic cigarette promotions and discussions.

Methods and analysis: A scoping review will be undertaken adhering to the methodology outlined in The Joanna Briggs Institute Manual for Scoping Reviews. Six key electronic databases will be searched to identify eligible studies. Studies must be published in English between 2007 and 2017,

examine and/or analyse content captured from online electronic cigarette promotions or discussions, and report results for electronic cigarettes separately to other forms of tobacco delivery. Studies will be screened initially by title and abstract, followed by full-text review. Results of the search strategy will be reported in a PRISMA flow diagram and presented in tabular form with accompanying narrative summary.

Ethics and dissemination: The methodology consists of reviewing and collecting data from publicly available studies, and therefore does not require ethics approval. Results will be published in a peer reviewed journal and be presented at national/international conferences. The results will be disseminated via social media and online platforms. Advocacy will be key to informing policy makers of regulatory and health issues that need to be addressed.

Registration details: The review was registered prospectively with The Joanna Briggs Institute Systematic Reviews database.

Strengths and limitations of this study

- This is the first scoping review to investigate what messages are being presented online in electronic cigarette promotions and discussions.
- The review will adhere to the methodology outlined in the Manual for Scoping Reviews by The Joanna Briggs Institute.
- The review will not assess the quality of the evidence identified from the literature, rather provide an overview of the existing evidence, regardless of quality.
- Multiple strategies will be employed to facilitate wide dissemination of the results.

KEYWORDS: electronic cigarettes; marketing; social media; public health; public policy

INTRODUCTION

The availability of less toxic forms of nicotine delivery represents a new paradigm for tobacco control, offering smokers an opportunity to inhale nicotine without inhaling tobacco smoke.[1, 2] The evident proliferation of alternative nicotine delivery devices, particularly electronic cigarettes, suggests that these devices may be perceived as a healthier alternative to traditional cigarettes.[3-5] However, there remains numerous unanswered questions regarding the overall public health benefits of these devices. Concerns have been raised about their effectiveness as a smoking cessation intervention, with dual use of cigarettes and electronic cigarettes potentially maintaining cigarette addiction;[6-9] their facilitation of smoking uptake among youth;[7, 10] the possible harms from device malfunctions;[11, 12] and the potential health risks associated with their use.[13] These issues underscore the urgent need for research that will inform policies and regulations for electronic cigarettes and other new and emerging nicotine delivery devices.

Electronic cigarettes (also commonly known as e-cigarettes) are battery-powered devices that heat a solution, known as juice or e-liquid, typically containing nicotine, which generates a vapour for

inhalation.[14] E-liquid is available in a range of flavours including butterscotch, cherry choc, and vanilla,[15] many of which appeal to youth.[16, 17] Studies have found wide variability in the level of nicotine delivered by these products,[18-20] device quality (e.g. airflow rate, aerosol production, leaking e-liquid cartridges) and labelling,[19, 21] and have connected electronic cigarette use with nicotine addiction, respiratory damage, aortic stiffness and intake of carcinogenic heavy metals.[22-26]

The International Tobacco Control Policy Evaluation Project is the first international cohort study of tobacco use.[27] The project's objective is to measure the psychosocial and behavioural impact of key national level policies of the WHO Framework Convention on Tobacco Control.[28] It is a collaborative effort with international health organisations and policymakers in more than 25 countries thus far.[29] Data from the project has confirmed, as well as extended understanding of the level of awareness and use of electronic cigarettes in high-income countries.[30] The data are consistent with results from the HealthStyles[31] and ConsumerStyles[32] surveys conducted in the United States providing further evidence of increasing levels of electronic cigarette awareness and use over the last decade. Australian data from the International Tobacco Control Project have shown that awareness of electronic cigarettes increased from 20% in 2010 to 66% in 2013, and self-reported use from 1% in 2010 to 7% in 2013,[33] even though the sale, purchase and marketing of electronic cigarettes was (and continues to be) prohibited.[34]

The promotion of electronic cigarettes has been increasing[35] with evidence of substantial investment from tobacco and other industry groups using websites, social media and other non-traditional marketing methods to increase the electronic cigarette market.[10, 36, 37] Electronic cigarettes are being advertised as a harm reduction alternative[10, 36] and promoted in a way to create a vaping culture that appeals to youth (even non-smokers),[38, 39] potentially supporting the creation of a whole new generation of nicotine addicted young people, serving as a gateway to tobacco use, and possibly normalising not only vaping but also renormalising smoking in public places.[40-42]

Consumer perceptions of electronic cigarettes' health risks and benefits are essential factors in determining uptake. Target groups adopting the product (e.g., past smokers, smokers attempting to quit, youth) and patterns of use impact on population health. Tobacco product adoption patterns are motivated and supported by tobacco industry marketing,[43] it is therefore imperative to understand the marketing consumers contend with. The internet remains a main channel for marketing electronic cigarette products.[44] Electronic cigarette retail websites and social media accounts present an assortment of explicit and implicit marketing claims, most commonly with regard to claims of health benefits, being less harmful than tobacco, and being able to assist in quitting smoking.[45-48] Claims of health benefits may undermine smoking cessation, and images that appeal to youth may prompt tobacco or electronic cigarette initiation.[48]

Very little is known about this emerging product, and there is a need for systematic research to understand the marketing drivers for the uptake of electronic cigarettes and how they are promoted

and accessed online. Only through this understanding can appropriate policies and regulations be developed. This scoping review aims to identify and describe the breadth of messages (e.g. health, smoking-cessation and price related claims) presented in online electronic cigarette promotions and discussions.

METHODS AND ANALYSIS

Study design

A scoping review will be undertaken to identify and describe the breadth of messages presented in online electronic cigarette promotions and discussions. Scoping reviews use a systematic process to map key concepts and types of evidence in an area of research, and for identifying gaps in an existing body of knowledge.[49-51] Scoping reviews tend to differ from systematic reviews in a number of ways and typically do not assess the quality of the studies included.[49, 51] This scoping review will adhere to the methodologically rigorous methods manual by The Joanna Briggs Institute (JBI).[52] The scoping review frameworks proposed by Arksey and O'Malley,[49] and Levac, Colquhoun and O'Brien[51] have been drawn upon in the development of the JBI methodology for scoping reviews. The JBI scoping review methodology consists of five parts: 1) Title, objective, and question; 2) Inclusion criteria; 3) Search strategy; 4) Extraction of the results; 5) Presentation of the results.

A preliminary search of the literature was conducted in the following databases: JBI Database of Scoping Reviews and Implementation Reports, Cochrane Database of Systematic Reviews, PROSPERO International Prospective Register of Systematic Reviews, Database of Promoting Health Effectiveness Reviews (DoPHER) and Epistemonikos which confirmed that no systematic or scoping review has been published or is currently underway on this topic. The review has been prospectively registered with JBI Systematic Reviews database (May 2017). It is anticipated that the scoping review will be completed by October 2017.

Title, objective, and question

Review title: *The messages presented in online electronic cigarette promotions and discussions: A scoping review protocol.* The title was guided by the "PCC" mnemonic (Population, Concept, and Context).[52] Using the PCC mnemonic enables the title to reflect key information about the focus and scope of the review to impending readers.

Review objective: *This scoping review will identify and describe the breadth of messages presented in online electronic cigarette promotions and discussions.* The review objective is congruent with the title and specifies what the review aims to achieve.

Review question: *What messages are presented in online electronic cigarette promotions and discussions?* The review objective includes the PCC elements and guides and directs the development of the inclusion criteria for the scoping review.

Inclusion criteria

This scoping review will include studies that have examined and analysed content captured from online electronic cigarette promotions and discussions (e.g. social media: YouTube, Facebook, Instagram, Twitter, blogs; and websites: retail sites, discussion forums). The media reported in the study must be clearly identified (e.g. analysis of tweets from Twitter). Studies reporting multiple media will be excluded (e.g. analysis of tweets and posts from Twitter and Facebook respectively) unless the media are reported separately. Other tobacco product studies (e.g. traditional tobacco cigarette, snus, chewing tobacco or hookah) will be excluded unless electronic cigarettes are also examined in the study and reported separately. In addition, studies that do not distinguish between electronic cigarettes and other forms of tobacco delivery will be excluded. Studies examining promotions or discussions in traditional media (e.g. TV, newspaper, and magazine) will be excluded unless online media is also examined in the study and reported separately. Studies will be limited to the following countries: United Kingdom, United States of America, New Zealand, Australia, and Canada. These countries have been selected as they are all developed countries and electronic cigarette use is well established.[29] The review will consider only peer reviewed primary research studies. Systematic and literature reviews, grey literature, editorials and thesis publications will be excluded.

Search strategy

The search strategy aims to identify peer reviewed primary research studies. Consultation with the Faculty Librarian identified five key databases: Medline, Scopus, ProQuest, Informit, and Google Scholar. A hand search of the Journal of Medical Internet Research will also be conducted to ensure no studies meeting the inclusion criteria are missed. Preliminary searches have located numerous articles published in this journal that are relevant to the review question. The first 200 results from Google Scholar will be examined for eligibility and subject to the screening process outlined below.

An initial search of MEDLINE was undertaken, followed by an analysis of the text words contained in the title, abstract, and index terms used to describe the articles. This informed the development of the search strategy, including identified keywords and index terms. A comprehensive search using all the identified keywords and index terms will be undertaken across all databases. Lastly, the reference list of all literature subject to full text review will be screened for additional studies and assessed for suitability based on the studies title and abstract.

The search will be limited to studies published in English in the last ten years (2007-2017), this period correlates with the approximate time that electronic cigarettes were first introduced to the United States and Europe.[53] The primary reviewer (KM) will contact authors of primary research studies if access to full text cannot be obtained. Studies reported as abstracts or for which full texts cannot be identified will be excluded from the review.

The initial search terms are: (“electronic cigarette” OR e-cigarette OR “electronic nicotine delivery system” OR “personal vapo?ri?er” OR “electronic nicotine delivery device” OR “vape pen” OR “smokeless tobacco” OR “electric cigarette” OR “electric nicotine delivery system” OR “electric nicotine delivery device” OR e- hookah OR e-juice OR e-liquid OR vaping) AND (“social media” OR internet OR online OR YouTube OR Facebook OR Instagram OR Twitter OR “online media” OR

website OR e-mail OR blog OR “digital media” OR “social networking”) AND (“content analysis” OR “content evaluation” OR message OR meaning OR coding OR “media analysis” OR “textual analysis”).

Study selection

Studies will be assessed for inclusion based on the inclusion criteria, examined initially by title and abstract. Full text articles will be retrieved if they appear to meet the inclusion criteria or if further examination is required to determine eligibility. Two reviewers (KM and JJ) will independently screen all titles/abstracts to determine their eligibility. Full text screening will then be undertaken by the primary reviewer to further determine study eligibility for inclusion in the review. This process will be assisted by the online screening and data extraction tool – Covidence.[54] Any disagreements will be resolved through discussion with a third reviewer (BM).

Extraction of the results

The relevant content from each study will be extracted using a data extraction proforma (Appendix I). Data extracted will include: Author(s), year of publication, origin/country of study, aim/purpose of study, media reported, sample size, study design/methods, results, and key findings that relate to the review question. There will be no attempt to contact authors of primary research studies for which extraction information is not reported.

To ensure inter-rater reliability, two reviewers (KM and JJ) independent of one another will chart the first five studies using the data extraction proforma and meet to determine whether their approach to data extraction is consistent with the research question and purpose. In addition this process will be used to refine and/or expand the data extraction proforma to ensure all relevant results are being extracted. Any changes made to the data extraction proforma will be reported on in the results publication. The primary reviewer will then extract data from the remaining studies unaccompanied.

Presentation of the results

The results of the search strategy will be presented in a PRISMA flow diagram indicating the number of articles found via each search method, the number of duplicates removed, and the number of studies excluded and included. A list of studies excluded after full text screening will be made available along with the main reason for exclusion.

To illustrate and summarise the main findings, results will be presented in tabular form (as per data extraction proforma), with an accompanying narrative summary describing how the results relate to the review objective and question.

ETHICS AND DISSEMINATION

The scoping review methodology consists of reviewing and collecting data from publicly available peer reviewed articles, therefore this study does not require ethics approval.

The results of the scoping review will be published in a peer reviewed journal. In addition the results will be presented at national/international conferences and symposia. Publications will be lodged on Research Gate and Academia to increase circulation. The expertise of the research team (health promotion, public health, knowledge translation) will support broad dissemination of the findings.

Given the sensitive nature of this research topic and the potential to increase youth interest, carefully considered findings of this research will be published via a media release article in The Conversation and on Twitter. Advocacy will be key to informing policy makers of regulatory and health issues that need to be addressed.

IMPLICATIONS

Findings from this scoping review may have implications for electronic cigarette marketing regulation. Additionally the findings will inform various components of a research project investigating electronic cigarette discussion amongst Australian public Twitter accounts.

AUTHORS' CONTRIBUTION

KM, JJ and BM conceptualised the research. KM drafted the protocol. JJ and BM aided in developing the research question and study methods, contributed meaningfully to editing, and approved the final manuscript.

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COMPETING INTERESTS

None declared.

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Appendix I: Data extraction proforma

Author(s)
Year of publication
Origin/country of study
Aim/purpose of study
Media reported
Sample size
Study design/methods
Results
Key findings that relate to the review question

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ABSTRACT

Introduction: Electronic cigarettes have become increasingly popular over the last ten years. These devices represent a new paradigm for tobacco control offering smokers an opportunity to inhale nicotine without inhaling tobacco smoke. To date there are no definite conclusions regarding the safety and long term health effects of electronic cigarettes, however, there is evidence that they are being marketed online as a healthier alternative to traditional cigarettes. This scoping review aims to identify and describe the breadth of messages (e.g. health, smoking-cessation and price related claims) presented in online electronic cigarette promotions and discussions.

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Registration details: The review was registered prospectively with The Joanna Briggs Institute Systematic Reviews database.

Strengths and limitations of this study

- This is a nascent area of research in which the scoping review methodology supports the generation of evidence to increase understanding of how the online space is being used to promote and discuss electronic cigarettes.
- The review will adhere to the methodology outlined in the Manual for Scoping Reviews by The Joanna Briggs Institute.
- The review will not assess the quality of the evidence identified from the literature, rather provide an overview of the existing evidence, regardless of quality.
- The heterogeneity of content areas covered by this methodology may provide challenges in synthesising the results into succinct conclusions or recommendations.

KEYWORDS: electronic cigarettes; marketing; social media; public health; public policy

INTRODUCTION

The availability of less toxic forms of nicotine delivery represents a new paradigm for tobacco control, offering smokers an opportunity to inhale nicotine without inhaling tobacco smoke.[1, 2] The evident proliferation of alternative nicotine delivery devices, particularly electronic cigarettes, suggests that these devices may be perceived as a healthier alternative to traditional cigarettes.[3-5] However, there remains numerous unanswered questions regarding the overall public health benefits of these devices. Concerns have been raised about their effectiveness as a smoking cessation intervention, with dual use of cigarettes and electronic cigarettes potentially maintaining cigarette addiction;[6-9] their facilitation of smoking uptake among youth;[7, 10] the possible harms from device malfunctions;[11, 12] and the potential health risks associated with their use.[13] These issues underscore the urgent need for research that will inform policies and regulations for electronic cigarettes and other new and emerging nicotine delivery devices.

Electronic cigarettes (also commonly known as e-cigarettes) are battery-powered devices that heat a solution, known as juice or e-liquid, typically containing nicotine, which generates a vapour for inhalation.[14] E-liquid is available in a range of flavours including butterscotch, cherry choc, and vanilla[15] which appeal to many youth.[16, 17] Studies have found wide variability in the level of nicotine delivered by these products,[18-20] device quality (airflow rate, aerosol production, leaking e-liquid cartridges) and labelling,[19, 21] and have connected electronic cigarette use with nicotine addiction, respiratory damage, aortic stiffness and intake of carcinogenic heavy metals.[22-26]

The International Tobacco Control Policy Evaluation Project is the first international cohort study of tobacco use.[27] The project's objective is to measure the psychosocial and behavioural impact of key national level policies of the WHO Framework Convention on Tobacco Control.[28] It is a collaborative effort with international health organisations and policymakers in more than 25 countries thus far.[29] Data from the project has confirmed, as well as extended understanding of the level of awareness and use of electronic cigarettes in high-income countries.[30] The data are consistent with results from the HealthStyles[31] and ConsumerStyles[32] surveys conducted in the United States providing further evidence of increasing levels of electronic cigarette awareness and use over the last decade. Australian data from the International Tobacco Control Project have shown that awareness of electronic cigarettes increased from 20% in 2010 to 66% in 2013, and self-reported use from 1% in 2010 to 7% in 2013,[33] even though the sale, purchase and marketing of electronic cigarettes was (and continues to be) prohibited.[34]

Regulation of electronic cigarettes differs among countries, ranging from no regulation, licensing as medicines, to complete prohibition.[35] For example, as of 2016 across the European Union electronic cigarettes cannot be advertised or promoted directly or indirectly, including via internet and commercial e-mail.[36] Similarly, the United States Food and Drug Administration recently extended its regulatory power to include electronic cigarettes, meaning they intend to regulate the marketing, labelling and manufacturing of these devices.[37, 38] Despite this, evidence suggests online marketing of electronic cigarettes continues.[39, 40]

There is increasing evidence of substantial financial investment by tobacco and other industry groups using websites, social media and other non-traditional marketing methods to increase the electronic cigarette market.[10, 41, 42] In the United States and Canada alone over $2 million is spent annually on online electronic cigarette advertising.[43] The online social networking service, Twitter, with 328 million active monthly users[44] is regularly used as a promotional tool by electronic cigarette manufactures and retail outlets. For example, electronic cigarette tweets were found to increase 10-fold during 2009-2010, of which 93% were classified as advertising.[45] The rise of new media has enabled the tobacco industry to penetrate channels such as Twitter and YouTube with information offsetting tobacco control denormalisation strategies,[46, 47] of which the electronic cigarette industry is now capitalising on.[48]

Electronic cigarette companies are employing techniques previously used by the tobacco industry to influence young people's decision to use cigarettes.[49] These include the addition of sweet

flavourings to e-liquid and promoting products using youth-resonant themes, such as sex appeal, rebellion, social status and celebrity testimonials.[50, 51] In addition, electronic cigarettes are being advertised as a harm reduction alternative[10, 41] and promoted in a way to create a vaping culture that appeals to youth (even non-smokers),[52, 53] potentially supporting the creation of a whole new generation of nicotine addicted young people, normalising not only vaping but also renormalising smoking in public places, and serving as a gateway to tobacco use.[54-56]

Consumer perceptions of electronic cigarettes' health risks and benefits are essential factors in determining uptake. Target groups adopting the product (past smokers, smokers attempting to quit, and youth) and patterns of use impact on population health. Tobacco product adoption patterns are motivated and supported by tobacco industry marketing,[57] it is therefore imperative to understand the marketing consumers contend with. The internet remains a main channel for marketing electronic cigarette products,[58] with electronic cigarette retail websites and social media accounts presenting an assortment of explicit and implicit marketing claims, most commonly with regard to claims of health benefits, being less harmful than tobacco, and being able to assist in quitting smoking.[43, 50, 59, 60] Claims of health benefits may undermine smoking cessation efforts and images that appeal to youth may prompt tobacco or electronic cigarette initiation.[50]

Very little is known about this emerging product, and there is a need for systematic research to understand the marketing drivers for the uptake of electronic cigarettes and how they are promoted and accessed online. Only through this understanding can appropriate policies and regulations be developed. This manuscript outlines a proposed methodology for a scoping review which aims to identify and describe the breadth of messages (e.g. health, smoking-cessation and price related claims) presented in online electronic cigarette promotions and discussions.

METHODS AND ANALYSIS

Study design

A scoping review will be undertaken to identify and describe the breadth of messages presented in online electronic cigarette promotions and discussions. Scoping reviews use a systematic process to map key concepts and types of evidence in an area of research and identify gaps in an existing body of knowledge.[61-63] Scoping reviews tend to differ from systematic reviews in a number of ways and typically do not assess the quality of the studies included.[61, 63] This scoping review will adhere to the methodologically rigorous methods manual by The Joanna Briggs Institute (JBI).[64] The scoping review frameworks proposed by Arksey and O'Malley,[61] and Levac, Colquhoun and O'Brien[63] have been drawn upon in the development of the JBI methodology for scoping reviews. The JBI scoping review methodology consists of five parts: 1) Title, objective, and question; 2) Inclusion criteria; 3) Search strategy; 4) Extraction of the results; 5) Presentation of the results.

A preliminary search of the literature was conducted in the following databases: JBI Database of Scoping Reviews and Implementation Reports, Cochrane Database of Systematic Reviews, PROSPERO International Prospective Register of Systematic Reviews, Database of Promoting Health Effectiveness Reviews (DoPHER) and Epistemonikos which confirmed that no systematic or

scoping review has been published or is currently underway on this topic. The review was prospectively registered with the JBI Systematic Reviews database (5 May 2017). It is anticipated that the scoping review will commence September 2017 with data extraction completed by November. We aim to submit the findings of the review in the form of a manuscript for peer review by the end of January 2018.

Title, objective, and question

Review title: *The messages presented in online electronic cigarette promotions and discussions: A scoping review protocol.* The title was guided by the "PCC" mnemonic (Population, Concept, and Context).[64] Using the PCC mnemonic enables the title to reflect key information about the focus and scope of the review to impending readers.

Review objective: *This scoping review will identify and describe the breadth of messages presented in online electronic cigarette promotions and discussions.* The review objective is congruent with the title and specifies what the review aims to achieve.

Review question: *What messages are presented in online electronic cigarette promotions and discussions?* The review objective includes the PCC elements and guides and directs the development of the inclusion criteria for the scoping review.

Inclusion criteria

This scoping review will include studies that have examined and analysed content captured from online electronic cigarette promotions and discussions (e.g. social media: YouTube, Facebook, Instagram, Twitter, blogs; and websites: retail sites, discussion forums). The media reported in the study must be clearly identified (e.g. analysis of tweets from Twitter). Studies reporting multiple media will be excluded (e.g. analysis of tweets and posts from Twitter and Facebook respectively) unless the results for each media are reported separately. Other tobacco product studies (e.g. traditional tobacco cigarette, snus, chewing tobacco or hookah) will be excluded unless electronic cigarettes are also examined in the study and reported separately. In addition, studies that do not distinguish between electronic cigarettes and other forms of tobacco delivery will be excluded. Studies examining promotions or discussions in traditional media (e.g. TV, newspaper, and magazine) will be excluded unless online media is also examined in the study and reported separately. Studies will be limited to the following countries: United Kingdom, United States, New Zealand, Australia, and Canada. These countries have been selected as they are all developed countries and electronic cigarette use is well established.[29] The review will consider only peer reviewed primary research studies. Systematic and literature reviews, grey literature, editorials and thesis publications will be excluded.

Search strategy

The search strategy aims to identify peer reviewed primary research studies. Consultation with the Faculty Librarian identified five key databases: Medline, Scopus, ProQuest, Informit, and Google Scholar. The research question crosses subject areas, hence the Medline, Scopus, Informit and ProQuest databases were identified due to their multidisciplinary nature and broad scope. Google

Scholar will provide a sound overview of what published material exists on the topic. A hand search of the Journal of Medical Internet Research will also be conducted to ensure no studies meeting the inclusion criteria are missed. Preliminary searches have located numerous articles published in this journal that are relevant to the review question. The first 200 results from Google Scholar will be examined for eligibility and subject to the screening process outlined below.

An initial search of Medline was undertaken, followed by an analysis of the text words contained in the title, abstract, and index terms used to describe the articles. This informed the development of the search strategy, including identified keywords and index terms. A comprehensive search using all the identified keywords and index terms will be undertaken across all databases. Lastly, the reference list of all articles subject to full text review will be screened for additional studies and assessed for suitability based on the studies title and abstract.

The search will be limited to studies published in English in the last ten years (2007-2017), this period correlates with the approximate time that electronic cigarettes were first introduced to the United States and Europe.[65] The primary reviewer (KM) will contact authors of primary research studies if access to full text cannot be obtained. Studies reported as abstracts or for which full texts cannot be identified will be excluded from the review.

The initial search terms are: ("electronic cigarette" OR e-cigarette OR "electronic nicotine delivery system" OR "personal vapo?ri?er" OR "electronic nicotine delivery device" OR "vape pen" OR "smokeless tobacco" OR "electric cigarette" OR "electric nicotine delivery system" OR "electric nicotine delivery device" OR e-hookah OR e-juice OR e-liquid OR vaping) AND ("social media" OR internet OR online OR YouTube OR Facebook OR Instagram OR Twitter OR "online media" OR website OR e-mail OR blog OR "digital media" OR "social networking") AND ("content analysis" OR "content evaluation" OR message OR meaning OR coding OR "media analysis" OR "textual analysis"). A transcript of a draft search strategy conducted in Medline is provided in Appendix I.

Retrieved citations from each database will be imported into EndNote X7 [66] reference management software, with duplicate citations removed before being imported into Covidence.[67] Covidence is a not-for-profit service working in partnership with Cochrane to improve the production and use of systematic reviews for health and wellbeing. Covidence is a web-based software platform that streamlines the production of systematic reviews by supporting the key steps in the review process such as citation screening; full text review; risk of bias assessment; extraction of study characteristics and outcomes; and export of data and references.[67]

Study selection

Studies will be assessed for inclusion based on the inclusion criteria, examined initially by title and abstract. Full text articles will be retrieved if they appear to meet the inclusion criteria or if further examination is required to determine eligibility. Two reviewers (KM and JJ) will independently screen all titles/abstracts to determine their eligibility. Full text screening will then be undertaken by the primary reviewer to further determine study eligibility for inclusion in the review. This process will be

assisted by the online screening and data extraction tool – Covidence.[67] Any disagreements will be resolved through discussion with a third reviewer (BM).

Extraction of the results

The relevant content from each study will be extracted using a data extraction proforma (Appendix II). Data extracted will include: Author(s), year of publication, origin/country of study, aim/purpose of study, media reported, sample size, study design/methods, results, and key findings that relate to the review question. There will be no attempt to contact authors of primary research studies for which extraction information is not reported. Primary outcome data will include the type of media being reported (e.g. Twitter or retail website), and the sentiment (positive, negative and neutral) and theme (e.g. cessation, flavour, discount) of the messages presented. Reporting on these outcomes will satisfy the aim of this scoping review. Secondary outcome data that will be extracted if reported on is author categorisation (e.g. community group, tobacco company).

To ensure inter-rater reliability, two reviewers (KM and JJ) independent of one another will chart the first five studies using the data extraction proforma and meet to determine whether their approach to data extraction is consistent with the research question and purpose. In addition this process will be used to refine and/or expand the data extraction proforma to ensure all relevant results are being extracted. Any changes made to the data extraction proforma will be reported on in the results publication. The primary reviewer will then extract data from the remaining studies unaccompanied.

Presentation of the results

The results of the search strategy will be presented in a PRISMA flow diagram indicating the number of articles found via each search method, the number of duplicates removed, and the number of studies excluded and included. A list of studies excluded after full text screening will be made available along with the main reason for exclusion.

To illustrate and summarise the main findings, results will be presented in tabular form (as per data extraction proforma), with an accompanying narrative summary describing how the results relate to the review objective and question.

ETHICS AND DISSEMINATION

The scoping review methodology consists of reviewing and collecting data from publicly available peer reviewed articles, therefore this study does not require ethics approval.

The results of the scoping review will be published in a peer reviewed journal and presented at national/international conferences and symposia. Additionally, findings will be distributed via academic, research and community publication, and news and social media platforms, such as The Conversation, Research Gate and Twitter, in order to increase circulation. Advocacy, such as discussions with, and presentations to professional associations will be key to informing policy makers of regulatory and health issues that need to be addressed. The expertise of the research team (health promotion, public health, knowledge translation) will support broad dissemination of the findings.

IMPLICATIONS

Findings from this scoping review will increase understanding of the types of electronic cigarette promotion and discussions occurring online. This may provide evidence that will inform the need for advertising restrictions, as well as stimulate further research to understand and combat the proliferation of this online advertising. Additionally the findings will inform various components of a research project investigating electronic cigarette discussion amongst Australian Twitter users. This study will access public Australian Twitter data through TrISMA (Tracking Infrastructure for Social Media Analysis),[68] a powerful new framework for tracking, storing, and processing social media communication activities of Australian users. The study aims to compare electronic cigarette Twitter discussion in 2012, 2014 and 2016 using a triaxial classification scheme to capture tweet sentiment, theme and author category.

AUTHORS' CONTRIBUTION

KM, JJ and BM conceptualised the research. KM drafted the protocol. JJ and BM aided in developing the research question and study methods, contributed meaningfully to editing, and approved the final manuscript.

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COMPETING INTERESTS

None declared.

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Appendix I: Draft MEDLINE search – Ovid interface

1. ("electronic cigarette" or e-cigarette or "electronic nicotine delivery system" or "personal vaporier" or "electronic nicotine delivery device" or "vape pen" or "smokeless tobacco" or "electric cigarette" or "electric nicotine delivery system" or "electric nicotine delivery device" or e-hookah or e-juice or e-liquid or vaping).ab.
2. ("social media" or internet or online or YouTube or Facebook or Instagram or Twitter or "online media" or website or e-mail or blog or "digital media" or "social networking").af.
3. ("content analysis" or "content evaluation" or message or meaning or coding or "media analysis" or "textual analysis").af.
4. 1 and 2 and 3
5. Limit 4 to yr="2007 – 2017"

Appendix II: Data extraction proforma

Author(s)
Year of publication
Origin/country of study
Aim/purpose of study
Media reported
Sample size
Study design/methods
Results
Key findings that relate to the review question

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item
ADMINISTRATIVE INFORMATION		
Title:		
Identification	1a	Identify the report as a protocol of a systematic review Title page and page 1.
Update	1b	If the protocol is for an update of a previous systematic review, identify as such Not applicable.
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number Page 5 paragraph 1. Registration with the JBI Systematic Reviews database does not provide a registration number and includes registration for scoping reviews.
Authors:		
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author Page 1.
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review Page 8 – Authors' contribution.
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments Not applicable.
Support:		
Sources	5a	Indicate sources of financial or other support for the review Page 8 – Funding statement.
Sponsor	5b	Provide name for the review funder and/or sponsor Page 8 – Funding statement.
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol Page 8 – Funding statement.
INTRODUCTION		
Rationale	6	Describe the rationale for the review in the context of what is already known Pages 2-4.
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)

		Page 5 – Title, objective, and question. Uses PCC (Population, Concept, and Context) mnemonic rather than PICO as per JBI methodology for scoping reviews.
METHODS		
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review Page 5 – Inclusion criteria.
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage Page 5-6 – Search strategy.
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated Supplementary file I and page 6 paragraph 4.
Study records:		
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review Page 6 paragraph 5.
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis) Page 6-7 – Study selection.
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators Page 7 – Extraction of the results.
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications Page 7 – Extraction of the results – and supplementary file II.
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale Page 7 paragraph 2. Please note that intervention research will not be reviewed in this scoping review.
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised Not applicable.
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ) Not applicable.
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)

		Not applicable.
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned Page 7 – Presentation of the results.
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies) Not applicable.
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE) Not applicable.

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

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