E-cigarettes: Effective Smoking Cessation Aids?

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Introduction

E-cigarettes

- Battery-powered devices that deliver a low concentration of nicotine without exposing users to tobacco smoke
  - •When users inhale, liquid heats up to create a visible **vapor**, without smoke or flames
  - •Liquid mixture is primarily composed of **propylene glycol and/or glycerol**
  - •Liquid may also include flavorings (e.g. chocolate, vanilla)
- After introduction to the U.S. in 2007, use among adults has greatly **increased** (Tseng et al., 2016)
- **Most reported reason for use:** smoking cessation (Harrell et al., 2014)
- **Not FDA approved** as cessation devices
- Will be subject to **FDA regulation** starting August 2016

Purpose

- To review current literature to determine whether or not **e-cigarettes are a safe and effective tool for promoting smoking cessation** among adult tobacco smokers

Methods

Databases

- PubMed, Cochrane Library, Joanna Briggs Institute Library, PsycNET, Ovid Medline

Keywords

- E-cigarettes, electronic cigarettes, smoking cessation, smokers, safe

Inclusion Criteria

- Current tobacco smokers, adults, meta-analyses, systematic reviews, randomized controlled trials, articles published within the past 10 years, articles published in English

Exclusion Criteria

- Subjects with illnesses/diseases/cancer, hospitalized patients

Results

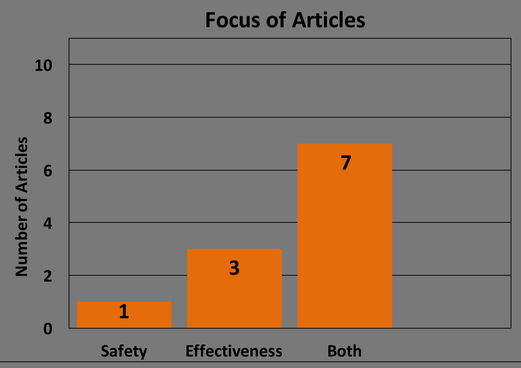
- **Total Articles Reviewed:** 11
- **Systematic Reviews/Meta-Analyses of RCTs and Quasi-Experimental Studies:** 3
- **Systematic Reviews of RCTs and Non-Experimental Studies:** 5
- **RCTs:** 3

Smoking Cessation

- **E-cigarettes *may* be moderately effective for promoting smoking cessation among adult tobacco smokers** (Rahman, Hann, Wilson, Mnatzaganian, & Worrall-Carter, 2015; Bullen et al., 2013; McRobbie et al., 2014; Caponnetto et al., 2013; Harrell et al., 2014; Khoudigian et al., 2016; Mcgraw, 2014; Bhatnagar et al., 2014)
  - •However, this data is **inconclusive** primarily because few controlled clinical trials have been conducted
- **Multiple studies found that e-cigarette users were able to reduce their cigarette consumption (cigarettes per day)** (Bullen et al., 2013; McRobbie et al., 2014; Caponnetto et al., 2013; Tseng et al., 2016)
  - Important finding because **gradual reduction in cigarette consumption helps aid future quit attempts** (Rahman et al., 2015)
- **One study found that e-cigarettes are associated with significantly *less* quitting among smokers** (Kalkhoran & Glantz, 2016)
- **Trials with weaker study designs tended to be more supportive of e-cigarettes than trials with experimental designs** (Mcgraw, 2014)
  - •For example, in a small and uncontrolled trial, e-cigarettes were associated with **statistically significant benefits** (Polosa et al., 2014)
  - •However, another study found that e-cigarettes were **no better or worse than nicotine patches** in terms of 6-month cigarette abstinence (Bullen et al., 2013)

Safety

- **E-cigarettes are of unknown safety due to lack of FDA regulation (prior to August 2016)** (Harrell et al., 2014; Bhatnagar et al., 2014)
- **Although they contain toxic chemicals, compared to conventional cigarettes, e-cigarettes are much lower in toxic content, cytotoxicity, adverse effects, and secondhand toxicity exposure** (Harrell et al., 2014)
- **E-cigarettes are associated with few adverse events** (Bullen et al., 2013)
- **To date, there are no published studies evaluating the long-term health effects of e-cigarettes** (Mcgraw, 2014)



Conclusions

E-cigarettes

- Efficacy as a **smoking cessation aid** has **not been established**
- Not proven to be better than other cessation methods
- **Largest RCT** to date found that e-cigarettes were **modestly effective** at helping smokers quit, with or without nicotine (Bhatnagar et al., 2014)
- **Much less harmful alternative** to smoking cigarettes
- More **large, controlled clinical trials are needed** to assess **safety** and **effectiveness** as a smoking cessation aid

Main Safety Concerns

- Uncertainty regarding **standardization** of ingredients
- Lack of **long-term adverse event data**

Nursing Implications

- Clinicians should be educated about e-cigarettes and prepared to counsel patients regarding ***comprehensive* tobacco cessation strategies**
- Not yet enough evidence for clinicians to counsel patients to use e-cigarettes as a *primary* cessation aid (Bhatnagar et al., 2014)
- E-cigarette use should be included in **tobacco screening** questions
- If a patient has **failed initial treatment**, or has been **intolerant** to or refused to use a conventional smoking cessation medication, it is reasonable for a clinician to **support their request to use e-cigarettes** (Bhatnagar et al., 2014)
- Clinicians should remind patients that e-cigarettes are **unregulated** (prior to August 2016), have **not been proven** as cessation devices, and may contain **toxic chemicals** (Bhatnagar et al., 2014)
- **No evidence** that e-cigarettes are **counterproductive** for smoking abstinence (Khoudigian et al., 2016)
- E-cigarettes have the potential to **improve population health** since they have far greater reach and higher acceptability among smokers than nicotine replacement therapy (Bullen et al., 2013)