# Acute Physiological effects of e-cigarette in human: a systematic review & meta-analysis

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## BACKGROUND:

- Millions of people have become e-cigarette (e-cig) users since their arrival in 2004, with teenagers and young adults currently the largest user groups.
- Several recent cases of e-cig related deaths & clinical incidents have raised concerns about the potential negative consequences of e-cig usage.
- There is a currently expanding literature on the acute effects of e-cigs, but, to date, there has not been a comprehensive synthesis of the acute exposure data in humans.

## OBJECTIVE:

- Summarise the current literature assessing the physiological effects of ***acute smoking of an e-cig*** on cardiovascular, respiratory, and inflammatory responses.

## METHOD:

- Systematic review and meta-analyses was developed following PRISMA-P guidelines & registered with PROSPERO (CRD42017062693).

## Inclusion Criteria:

- English & French peer reviewed articles in human participants with physiological measures pre and post acute smoking of an e-cig.

## Exclusion Criteria:

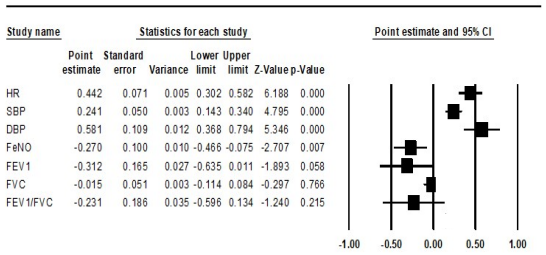
- Passive smoking;
- Longitudinal study, cross-sectional and case control study and case reports;
- Editorials, notes and abstracts presented on conferences;
- Structural design of the e-cigarette device;
- Smoking cessation effect;
- Perception/knowledge regarding e-cigarette;
- Animal study and in-vitro study.

## Databases:

- PubMed, Scopus, Web of Science, Cochrane.

## RESULTS:

- Potentially relevant articles were: **14041**
- Full text articles reviewed**: 65**
- Final included articles: **34**
- The initial meta-analyses provides the evidence of negative impact on acute physiological outcomes though the effect sizes are small.-
  - Increase in cardiovascular (HR,SBP & DBP) parameters.
  - Decrease in FeNO which indicates change in both respiratory & inflammatory responses.



| Study name | Point estimate | Standard error | Variance | Lower limit | Upper limit | Z-Value | p-Value |
|---|---|---|---|---|---|---|---|
| HR | 0.442 | 0.071 | 0.005 | 0.302 | 0.582 | 6.188 | 0.000 |
| SBP | 0.241 | 0.050 | 0.003 | 0.143 | 0.340 | 4.795 | 0.000 |
| DBP | 0.581 | 0.109 | 0.012 | 0.368 | 0.794 | 5.346 | 0.000 |
| FeNO | -0.270 | 0.100 | 0.010 | -0.466 | -0.075 | -2.707 | 0.007 |
| FEV1 | -0.312 | 0.165 | 0.027 | -0.635 | 0.011 | -1.893 | 0.058 |
| FVC | -0.015 | 0.051 | 0.003 | -0.114 | 0.084 | -0.297 | 0.766 |
| FEV1/FVC | -0.231 | 0.186 | 0.035 | -0.596 | 0.134 | -1.240 | 0.215 |



## CONCLUSION:

- This study indicates that acute smoking of an e-cig could negatively impact on several physiological parameters.
- The current review provides potentially important evidence in the continued debate about the use and regulation of e-cigs.