

E-cigarette use in pregnancy – systematic review

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Smoking in pregnancy

In GB, 11% smoke at time of delivery



General risks

>50% of long-term smokers die from smoking

200 deaths per day in Great Britain

Mainly cancer, lung disease, cardiovascular diseases



Specific risks

Miscarriage, Stillbirth

Premature birth

Low birth weight

Perinatal morbidity and mortality

Sudden infant death

Attention problems



Quitting Interventions

Counselling, financial incentives and providing feedback work

Nicotine replacement therapy (NRT) little efficacy

Other effective medications not prescribed in pregnancy

Surgeon General report, 2014
Chamberlain et al, 2017
Coleman et al, 2015

Nicotine (key addictive substance in smoking)



In general

Not direct cause of death and disease caused by smoking



Animal studies in pregnancy

Adverse effects on lung development / function and behaviour

Exposure models may not be applicable to humans



Nicotine replacement therapy (NRT)

Safe in pregnancy

Pregnant smokers who switch to NRT reduce nicotine exposure



What
about
vaping?

Prevalence during pregnancy and post-partum?

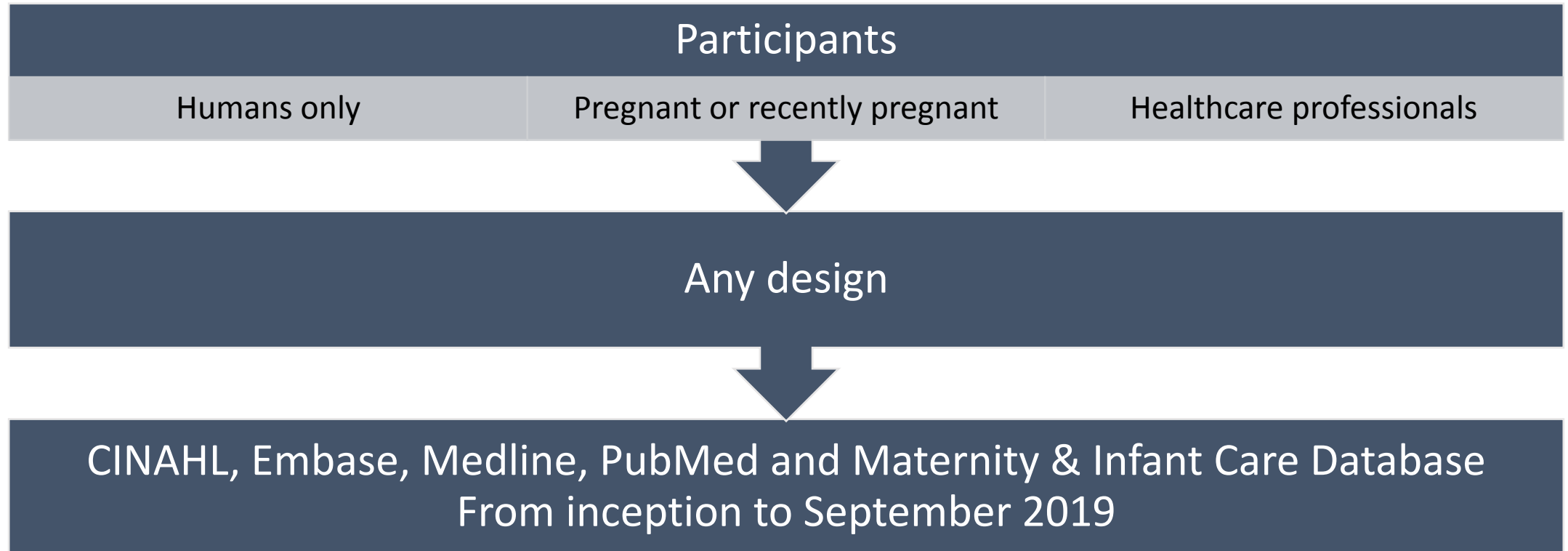
Patterns of use around the time of pregnancy?

Perceptions of vaping in pregnancy?

Maternal health or pregnancy outcomes?

Effects on smoking cessation or reduction?

Systematic search



27 Studies included



Location

US: 18

UK: 5

Mixed: 3

Australia: 1



Design

Cross-sectional survey: 13

(4 representative of US or US State)

Qualitative: 11

Longitudinal: 2

Other: 4



Population

Pregnant: 20

Healthcare professionals: 5

Other: 3

Prevalence
during
pregnancy

Study *	Smoking, %	Vaping, %	Vaping among current or recent smokers, %
Kapaya et al, 2019			
3 months before pregnancy	16.4	5.8	21.7
3 rd trimester	6.1	1.4	5.1
Kurti et al, 2017	13.8	4.9	28.5
Liu et al, 2019	8.0	3.6	38.9

*Representative surveys from the US or individual US states

Characteristics of use

Frequency

- Among ever users
- 8% daily use
-
- Ashford et al 2016

Flavours

- Fruit: 69%
- Tobacco: 13%
- Stroud et al, 2019

Type of e-cigarette

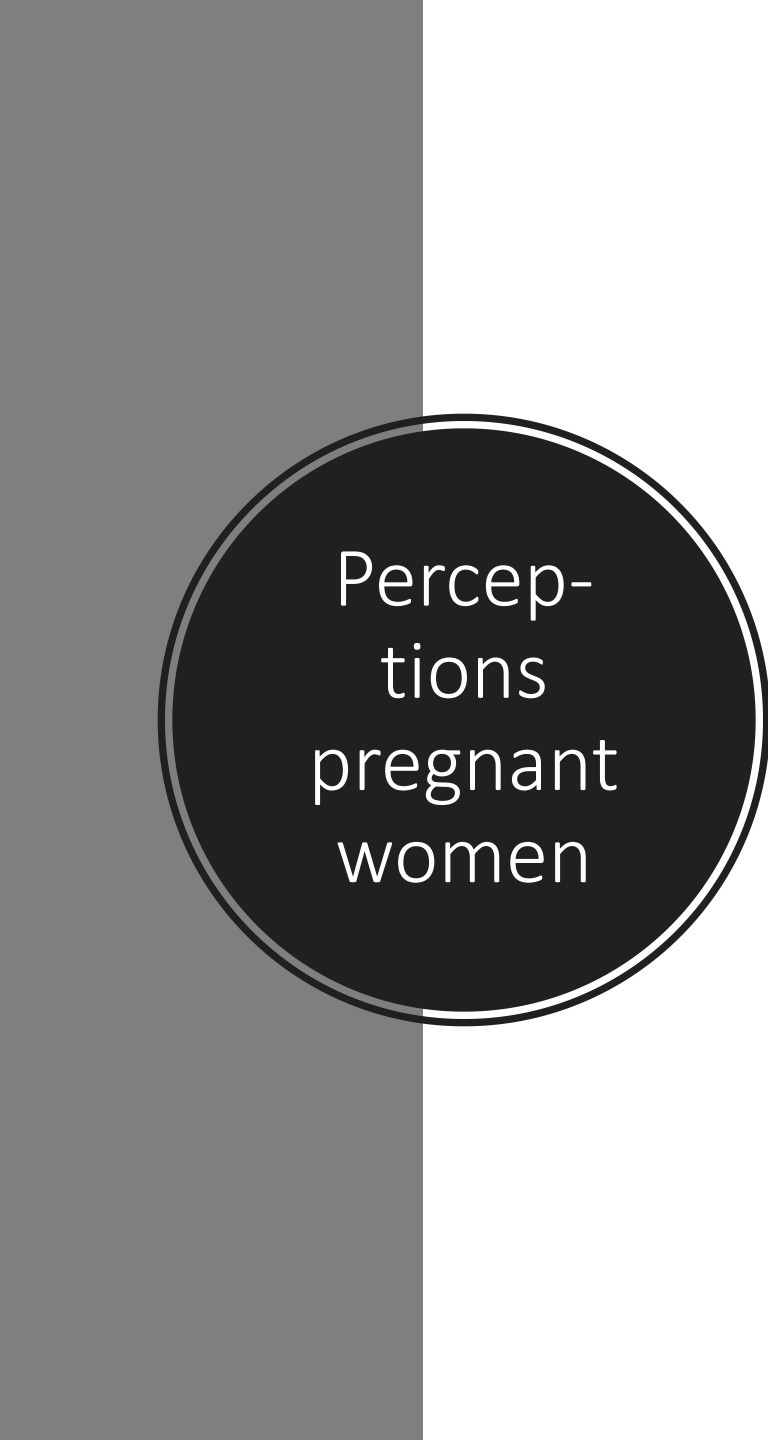
- 50% of vapers used pre-filled cartridges
- Oncken et al, 2017

Nicotine strength

- 38% of pregnant vapers used nicotine
- Kapaya et al, 2019



Little information reported



Percep-
tions
pregnant
women

Reasons for use included

- To quit smoking
- To reduce harm to self and others
- Curiosity
- Avoid withdrawal (believe harmful to fetus)
- Reduce stigma
- Reduce stress
- ⑩ Reasons are partly determined by questions and options presented by researchers

Uncertainty about level of harm

Uncertainty about efficacy for smoking cessation

Health-care

E-cigs as personal choice
69% in smoking cessation service

Some support vaping

Some see as against medical advice

Unsure about relative harms

Lack of licensed product as barrier

Pregnancy
outcomes
or maternal
health



Pregnancy outcomes or maternal health

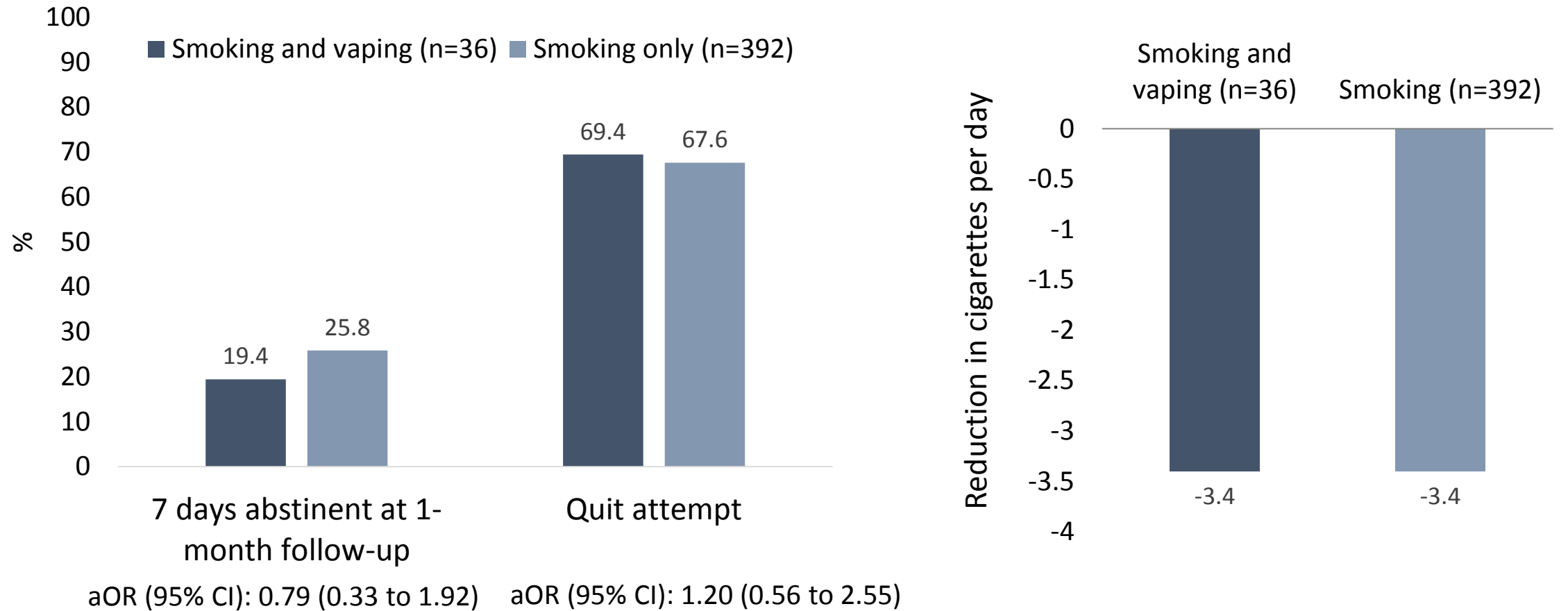
Use at baseline	n	Adjusted mean z-score birth weight difference (SE)	Smallness for gestational age	
			n (%)	Adjusted risk ratio (95% CI)
Vaping and smoking	17	-0.303 (0.274)	4 (23.5)	2.5 (0.7–8.8)
Vaping (only?)	6	-0.540 (0.417)	2 (33.3)	5.1 (1.2–22.2)
Smoking	56	-0.490 (0.190)	13 (23.1)	2.6 (0.9–7.2)
Unexposed	64	0 (Referent)	5 (7.8)	1 (Referent)

- Non-smoking for unexposed biochemically verified, for vapers not verified
- Extremely small number of vapers

A well-powered study to detect a 2-fold to 3-fold increase in risk of SGA, assuming a 12% risk of SGA among pregnant women in the referent group, would require about 300 participants per group.

Changes in smoking behaviour

Secondary data analysis of RCT of mobile phone health intervention



Discussion



**Prevalence, reasons
for use and
uncertainties similar
to other groups**



Effects on smoking

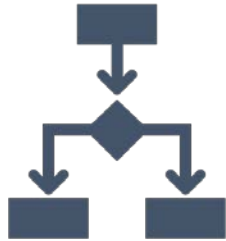


**Effects on pregnancy-
related outcomes**



**Variations of any
effects with
characteristics of use**

Ongoing studies include



Randomised controlled trial e-cigarettes versus nicotine patches for smoking cessation

Hajek, Queen Mary, University of London



Longitudinal survey of pregnant women including birthweight

Cooper and Bowker, University of Nottingham



Analysis of US birth record data on over 50,000 women

Hawkins, Boston College

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