RWD256

Comparative Effects of Smoking Cessation Intervention for Adolescents: A Systematic Review and Network Meta-analysis

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INTRODUCTION

- Tobacco use causes over 8 million deaths each year, with adolescents at high risk due to early initiation and nicotine dependence.
- Evidence for effective cessation treatments in this group is limited and inconsistent.
- This study uses a network meta-analysis to compare smoking cessation interventions in adolescents and identify the most effective strategies to support clinical and policy decisions.

OBJECTIVES

- To compare the efficacy of different smoking cessation interventions for adolescents using a network meta-analysis (NMA) approach.

METHODS

- **Databases searched:** PubMed, EMBASE, Cochrane CENTRAL, CINAHL, PsycINFO (inception–Feb 28, 2024)
- **Inclusion criteria:** RCTs on smoking cessation in adolescents, with biochemical verification of abstinence
- **Intervention classification:** Based on main active components reported in trials
- **Study selection:** Two pairs of researchers, independently and in duplicate
- **Risk of bias:** Cochrane RoB 2.0 tool
- **Analysis:** Network meta-analysis (random-effects, frequentist framework)
- **Effect measure:** Risk ratios (RRs) with 95% CIs
- **Certainty of evidence:** CINeMA platform

RESULTS

- Fourteen RCTs (2,630 participants)
- Nine had some risk of bias.
- No overall significant differences were observed.
- At 6 months, CBT, NRT + CBT, and non-NRT interventions significantly improved cessation (RRs 2.31, 2.44, and 1.56, respectively).
- Certainty of evidence was low to very low.
- No differences were found across formats or settings.

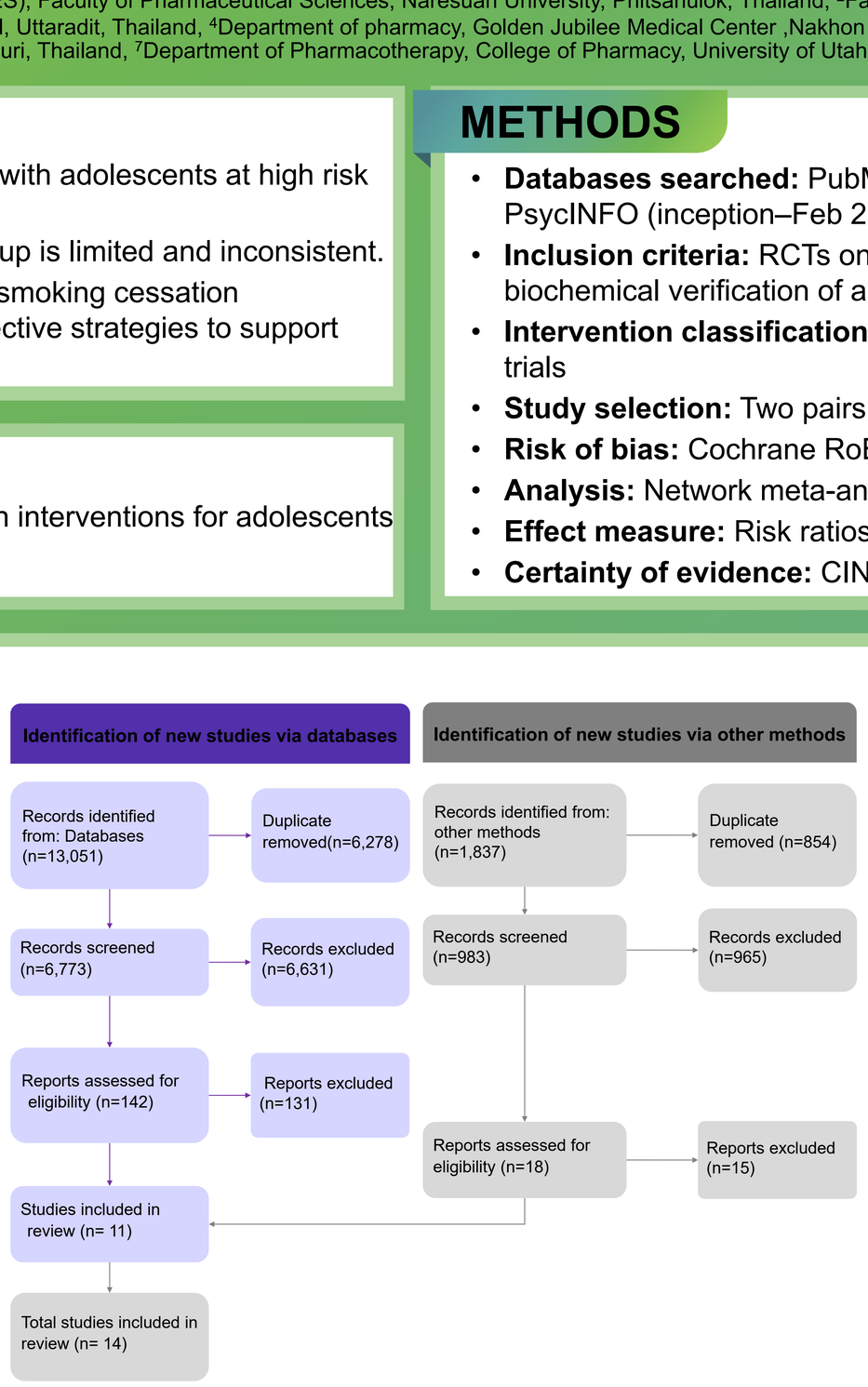

Figure 1: PRISMA flow diagram of selected articles

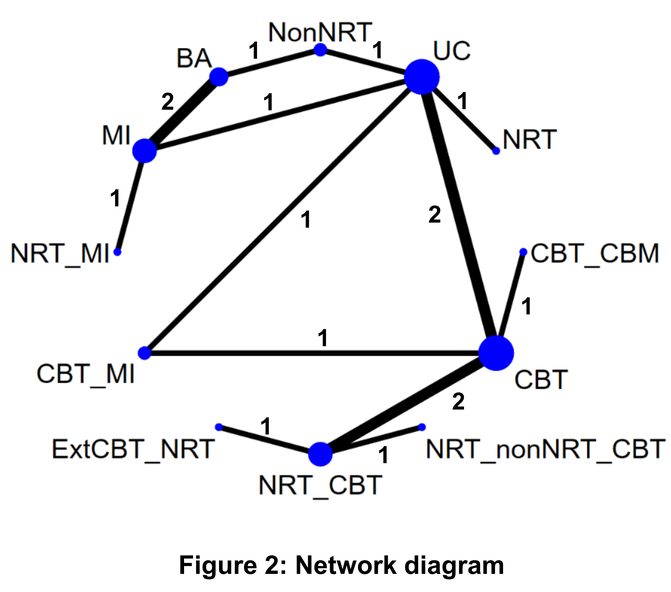

Figure 2: Network diagram

Table 1: League table

BA									
0.57 (0.10,3.20) ⊕○○○	**CBT**								
0.53 (0.02,17.08) ⊕○○○	0.94 (0.05,19.01) ⊕○○○	**CBT+CBM**							
0.63 (0.08,4.74) ⊕○○○	1.11 (0.25,4.90) ⊕○○○	1.19 (0.04,34.14) ⊕○○○	**CBT+MI**						
0.23 (0.02,3.64) ⊕○○○	0.41 (0.05,3.48) ⊕○○○	0.44 (0.01,17.68) ⊕○○○	0.37 (0.03,5.11) ⊕○○○	**ExtCBT+NRT**					
0.56 (0.16,1.89) ⊕○○○	0.98 (0.19,4.98) ⊕○○○	1.05 (0.03,32.12) ⊕○○○	0.88 (0.13,5.84) ⊕○○○	2.37 (0.15,37.31) ⊕○○○	**MI**				
1.16 (0.13,10.14) ⊕○○○	2.06 (0.29,14.47) ⊕○○○	2.20 (0.06,79.52) ⊕○○○	1.85 (0.21,16.58) ⊕○○○	4.97 (0.27,92.48) ⊕○○○	2.09 (0.27,16.03) ⊕○○○	**NRT**			
0.68 (0.07,6.35) ⊕○○○	1.21 (0.30,4.91) ⊕⊕○○	1.29 (0.05,35.78) ⊕○○○	1.08 (0.14,8.64) ⊕○○○	2.92 (0.59,14.45) ⊕○○○	1.23 (0.13,11.57) ⊕○○○	0.59 (0.05,6.78) ⊕○○○	**NRT+CBT**		
0.56 (0.01,40.30) ⊕○○○	0.98 (0.01,81.14) ⊕○○○	1.05 (0.01,219.72) ⊕○○○	0.88 (0.01,80.99) ⊕○○○	2.37 (0.02,333.11) ⊕○○○	1.00 (0.02,60.67) ⊕○○○	0.48 (0.00,46.69) ⊕○○○	0.81 (0.01,87.53) ⊕○○○	**NRT+MI**	
0.89 (0.06,12.32) ⊕⊕○○	1.57 (0.22,11.33) ⊕⊕○○	1.68 (0.05,61.63) ⊕⊕○○	1.41 (0.12,17.16) ⊕⊕○○	3.81 (0.46,31.62) ⊕○○○	1.60 (0.11,22.39) ⊕⊕○○	0.77 (0.05,12.75) ⊕○○○	1.31 (0.33,5.22) ⊕⊕○○	1.60 (0.01,210.91) ⊕○○○	**NRT+NonNRT +CBT**
0.71 (0.19,2.67) ⊕⊕○○	1.26 (0.26,6.08) ⊕○○○	1.35 (0.05,40.34) ⊕○○○	1.13 (0.17,7.44) ⊕○○○	3.05 (0.22,43.06) ⊕○○○	1.29 (0.30,5.57) ⊕○○○	0.61 (0.08,4.73) ⊕○○○	1.05 (0.13,8.62) ⊕⊕○○	1.29 (0.02,100.65) ⊕○○○	0.80 (0.06,10.00) ⊕⊕○○
0.83 (0.20,3.38) ⊕○○○	1.46 (0.51,4.18) ⊕○○○	1.56 (0.06,37.95) ⊕○○○	1.31 (0.31,5.62) ⊕○○○	3.53 (0.32,39.63) ⊕○○○	1.49 (0.45,4.94) ⊕○○○	0.71 (0.14,3.69) ⊕○○○	1.21 (0.20,7.42) ⊕○○○	1.49 (0.02,107.27) ⊕○○○	0.93 (0.09,9.09) ⊕⊕○○

NonNRT		
1.16 (0.35,3.86) ⊕⊕○○	**UC**	

The point prevalence abstinence was pooled using risk ratio (RR) with the corresponding 95% confidence interval (95%CI)

Certainty of evidence: ⊕○○○=Very low; ⊕⊕○○=Low; ⊕⊕⊕○=Moderate; ⊕⊕⊕⊕=High

Abbreviation: BA= brief advice, CBT= cognitive behavioral therapy, MI= motivational interviewing, NRT= nicotine replacement therapy, Non-NRT= non-nicotine replacement therapy, CBT+CBM= cognitive behavioral therapy and cognitive behavioral bias modification, CBT+MI= cognitive behavioral therapy and motivational interviewing, ExtCBT+NRT= extended cognitive behavioral therapy and nicotine replacement therapy, NRT+CBT= nicotine replacement therapy and cognitive behavioral therapy, NRT+MI= nicotine replacement therapy and motivational interviewing, NRT+NonNRT+CBT= nicotine replacement therapy and non-nicotine replacement therapy and cognitive behavioral therapy, UC= usual care

Table 3: The surface under the cumulative ranking curve (SUCRA) of point prevalence abstinence

Intervention	SUCRA
ExtCBT+NRT	79.6
MI	59
CBT	58.2
CBT+CBM	55.1
NRT+MI	52.5
CBT+MI	52.1
NRT+CBT	48.8
NonNRT	47.9
NRT+NonNRT+CBT	40.6
UC	40.3
BA	34.3
NRT	31.7

CONCLUSION

- Although no intervention showed a clear benefit in helping adolescents quit smoking, CBT-based and non-NRT interventions may improve short-term abstinence.
- However, the low-certainty evidence underscores the need for high-quality trials to confirm these findings, enhance real-world applicability, and support long-term cessation.

CONTRACT INFORMATION

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