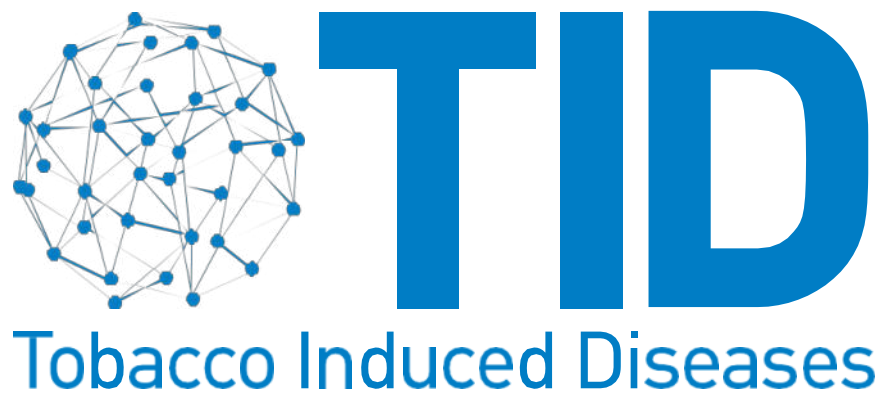




Supplementary file

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Section and Topic	Item #	Checklist item	Reported (Yes/No)
TITLE			
Title	1	Identify the report as a systematic review.	Yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Yes
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Yes
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	
Synthesis of results	6	Specify the methods used to present and synthesise results.	Yes
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	Yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	Yes
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	Yes
Registration	12	Provide the register name and registration number.	Yes

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71. This work is licensed under CC BY 4.0. To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Title page, abstract
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Paragraphs 1–9
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Final paragraph
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Eligibility Criteria
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Database and Search Strategies Supplementary Appendix A
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	→ Study Screening and Selection
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Data Extraction
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Data Extraction Strategy for Data Synthesis
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Data Extraction Tables 1–3
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Assessment of Study Quality
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	SWiM Synthesis; Table 3
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	SWiM Framework; Strategy for Data Synthesis
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	SWiM Framework; Strategy for Data Synthesis
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	SWiM Framework; Strategy for Data Synthesis
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	SWiM Framework; Strategy for Data Synthesis
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	SWiM Framework;

Section and Topic	Item #	Checklist item	Location where item is reported
			Strategy for Data Synthesis
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	SWiM Framework; Strategy for Data Synthesis
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Strategy for Data Synthesis
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Strategy for Data Synthesis
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Study Selection; Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Study Selection
Study characteristics	17	Cite each included study and present its characteristics.	Study Characteristics; Tables 1–3
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	-
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	SWiM Synthesis; Tables 3–4
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	SWiM Synthesis
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	SWiM Synthesis
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	SWiM Synthesis
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	SWiM Synthesis
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	-
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	-
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Discussion sections
	23b	Discuss any limitations of the evidence included in the review.	Discussion sections
	23c	Discuss any limitations of the review processes used.	Discussion sections
	23d	Discuss implications of the results for practice, policy, and future research.	Discussion sections
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	First paragraph
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	First paragraph
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	First paragraph
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Funding Section
Competing interests	26	Declare any competing interests of review authors.	Declaration of Interest

Section and Topic	Item #	Checklist item	Location where item is reported
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Data Availability Section

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. This work is licensed under CC BY 4.0. To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>

Example of searching

For Web of Science

<https://www.webofscience.com/wos/woscc/summary/a2c5c665-df36-4b95-8cc8-85b935d2b1f1-feece85a/relevance/1>

#1

ALL=(Electronic Nicotine Delivery Systems OR Vaping) and Vaping (Should – Search within topic) and **Electronic Nicotine Delivery Systems** (Should – Search within topic) and **E-cigarettes** (Should – Search within topic) and **E-cigarette** (Should – Search within topic) and **Electronic Cigarettes** (Should – Search within topic) and **Electronic Cigarette** (Should – Search within topic) and **Ends** (Should – Search within topic) and **Electronic Nicotine Delivery System** (Should – Search within topic) and **Electronic Nicotine Delivery Devices** (Should – Search within topic)

#2

ALL=((adolescent OR child OR teen OR youth)) and Children (Should – Search within topic) and **Adolescents** (Should – Search within topic) and **Child** (Should – Search within topic) and **Adolescent** (Should – Search within topic) and **Adolescence** (Should – Search within topic) and **Youth** (Should – Search within topic)

#3

ALL=(Gamification) and Gamification (Should – Search within topic) and **Game Elements** (Should – Search within topic) and **Serious Games** (Should – Search within topic) and **Game-based Learning** (Should – Search within topic) and **Gamification In Education** (Should – Search within topic) and **Gamified Learning** (Should – Search within topic)

#4

ALL=(prevention OR cessation) and Prevention (Should – Search within topic) and **Smoking Cessation** (Should – Search within topic) and **Primary Prevention** (Should – Search within topic) and **Secondary Prevention** (Should – Search within topic)

#1 AND #2 AND #3 AND #4

For MEDLINE Complete, CINAHL Complete, Psychology and Behavioral Sciences Collection, Education Research Complete

ERC

(electronic nicotine delivery* OR vape* OR e-cig*) AND (child* OR Adolescence* OR teen* OR youth*) AND (prevent* OR cease*) AND (gamification* OR game elements* OR serious games* OR video games* OR digital games* OR gamification in education* OR gamified learning* OR game based learning*)

https://research.ebsco.com/c/aorqfc/search/results?q=%28electronic+nicotine+delivery*+OR+vape*+OR+e-cig*%29+AND+%28child*+OR+Adolescence*+OR+teen*+OR+youth*%29+AND+%28prevent*+OR+cease*%29+AND+gamification*+OR+game+element*+OR+serious+games*+OR+video+games*+OR+digital+games*+OR+gamification%0Ain+education*+OR+gamified+learning*+OR+game+based+learning*&autocorrect=y&db=ehh&expanders=fullText&expanders=concept&facetFilter=Language%3AZW5nbGlzaA%3D%3D&limiters=PZ5%3AQXJ0aWNsZQ%3D%3D%2CLA10%3ARW5nbGlzaA%3D%3D%2CPT83%3AKFBUIEFjYWRlbWljIEpvdXJuYWwp%2CFT%3AY&qm=W3sidmFsdWUiOiJlbGVjdHJvbmlljG5pY290aW5lIGRlbiG2ZXJ5KiBPUiB2YXBKiBPUiBILWNpZyoiLCJ0eXBlljoidGV4dCJ9LHsidmFsdWUiOiJBTkQlLCJ0eXBlljoibG9naWMifSx7InZhbHVlIjoIY2hpbGQqIE9SIEFkb2xlc2NlbnNlKiBPUiB0ZWVuKiBPUiB5b3V0aCoilLCJ0eXBlljoidGV4dCJ9LHsidmFsdWUiOiJBTkQlLCJ0eXBlljoibG9naWMifSx7InZhbHVlIjoIChJldmVudCogT1lgY2Vhc2UqliwidHlwZSI6InRleHQifSx7InZhbHVlIjoIQU5EliwidHlwZSI6ImxvZ2ljIn0seyJ2YWx1ZSI6ImdhbWlmaWNhdGlvbiogT1lgZ2FtZSBibGVtZW50cyogT1lgc2VyaW91cyBnYW1lcyogT1lgdmkZlW8gZ2FtZXMQlE9SIGRlPZ2l0YWwgZ2FtZXMQlE9SIGdhbWlmaWNhdGlvblxuZW50cyogT1lY2F0aW9uKiBPUiBnYW1pZmlZCBsZWYybmluZyogT1lgZ2FtZSBiYXNlZCBsZWYybmluZyoiLCJ0eXBlljoidGV4dCJ9XQ%3D%3D&searchMode=all&searchSegment=all-results

CINAHL

<https://research.ebsco.com/c/aorqfc/search/results?db=ccm&expanders=fullText&expanders=concept&facetFilter=Language%3AZW5nbGlzaA%3D%3D%2CSubjectAge%3AYWRvbGVzY2VudDogMTMtMTggeWVhcnM%3D%26Y2hpbGQ6IDYtMTIgeWVhcnM%3D%26YWxslGNoaWxk%26Y2hpbGQsIHByZXNjaG9vbDogMi01IHllYXJz%2CsourceTypes%3AMTAwMEFK&limiters=FT%3AY%2CLA99%3AZW5n&q=%28%28electronic%20nicotine%20delivery%2A%20OR%20vape%2A%20OR%20e-cig%2A%29%29%20AND%20%28%28child%2A%20OR%20Adolescence%2A%20OR%20teen%2A%20OR%20youth%2A%29%29%20AND%20%28%28prevent%2A%20OR%20cease%2A%29%29%20AND%20%28%28gamification%2A%20OR%20game%20elements%2A%20OR%20serious%20game%2A%20OR%20video%20games%2A%20OR%20digital%20games%2A%20OR%20gamification%20in%20education%2A%20OR%20gamified%20learning%2A%20OR%20game%20based%20learning%2A%29%29&qm=W3sidmFsdWUiOiJlbGVjdHJvbmlljG5pY290aW5lIGRlbiG2ZXJ5KiBPUiB2YXBKiBPUiBILWNpZyoiLCJ0eXBlljoidGV4dCJ9LHsidmFsdWUiOiJBTkQlLCJ0eXBlljoibG9naWMifSx7InZhbHVlIjoIY2hpbGQqIE9SIEFkb2xlc2NlbnNlKiBPUiB0ZWVuKiBPUiB5b3V0aCoilLCJ0eXBlljoidGV4dCJ9LHsidmFsdWUiOiJBTkQlLCJ0eXBlljoibG9naWMifSx7InZhbHVlIjoIChJldmVudCogT1lgY2Vhc2UqliwidHlwZSI6InRleHQifSx7InZhbHVlIjoIQU5EliwidHlwZSI6ImxvZ2ljIn0seyJ2YWx1ZSI6ImdhbWlmaWNhdGlvbiogT1lgZ2FtZSBibGVtZW50cyogT1lgc2VyaW91cyBnYW1lcyogT1lgdmkZlW8gZ2FtZXMQlE9SIGRlPZ2l0YWwgZ2FtZXMQlE9SIGdhbWlmaWNhdGlvbiogT1lgZ2FtZSBibGVtZW50cyogT1lY2F0aW9uKiBPUiBnYW1pZmlZCBsZWYybmluZyogT1lgZ2FtZSBiYXNlZCBsZWYybmluZyoiLCJ0eXBlljoidGV4dCJ9XQ%3D%3D&searchMode=all&sort=relevance>

electronic nicotine delivery* OR vape* OR e-cig*
child* OR Adolescence* OR teen* OR youth*
prevent* OR cease*

gamification OR game elements OR serious games OR video games OR digital games OR gamification in education OR gamified learning OR game based learning

#1 AND #2 AND #3 AND #4

Medline

<https://research.ebsco.com/c/aorqfc/search/results?db=mdc&expanders=fullText&expanders=concept&facetFilter=Language%3AZW5nbGlzaA%3D%3D%2CSubjectAge%3AYWRvbGVzY2VudDogMTMtMTggeWVhcnM%3D%26Y2hpbGQ6IDYtMTIgeWVhcnM%3D%26YWxslGNoaWxk%26Y2hpbGQsIHByZXNjaG9vbDogMi01IHllYXJz%2CsourceTypes%3AMTAwMEFK&limiters=FT%3AY%2CLA1%3AY%2CRV%3AY&q=%28%28electronic%20nicotine%20delivery%2A%20OR%20vape%2A%20OR%20e-cig%2A%29%29%20AND%20%28%28child%2A%20OR%20Adolescence%2A%20OR%20teen%2A%20OR%20youth%2A%29%29%20AND%20%28%28prevent%2A%20OR%20cease%2A%29%29%20AND%20%28%28gamification%2A%20OR%20game%20elements%2A%20OR%20serious%20game%2A%20OR%20video%20games%2A%20OR%20digital%20games%2A%20OR%20gamification%20in%20education%2A%20OR%20gamified%20learning%2A%20OR%20game%20based%20learning%2A%29%29&qm=W3sidmFsdWUiOiIoKGVsZWNoZW50cm9uaWMgbmljb3RpbmUgZGVsaXZlcnkqIE9SIHZhcnGUqIE9SIGUtY2lnKikpIEFORCAoKGNoaWxkKiBPUIBBZG9sZXNjZW5jZSogT1lgdGVlbiogT1lgeW91dGgqKSkgQU5EICgocHJldmVudCogT1lgY2Vhc2UqKSkgQU5EICgoZ2FtaWZpY2F0aW9uKiBPUIBnYW1lIGVsZW1lbnRzKiBPUIBzZXJpb3VzIGdhbWVzKiBPUIB2aWRlbyBnYW1lcyogT1lgZGlnaXRhbCBnYW1lcyogT1lgZ2FtaWZpY2F0aW9uIGluIGVkdWNhdGlvbiogT1lgZ2FtaWZpZWQgbGVhcn5pbmcqIE9SIGdhbWUgYmFzZWQgbGVhcn5pbmcqKSkilCJ0eXBlljoidGV4dCJ9XQ%3D%3D&searchMode=all&sort=relevance>

For SCOPUS

ALL ("electronic nicotine delivery*" OR "vape*" OR "e-cig" *) AND ("child*" OR "Adolescence*" OR "teen*" OR "youth*") AND ("prevent*" OR "cease*") AND ("gamification" OR "game elements" OR "serious games" OR "video games" OR "digital games" OR "gamification in education" OR "gamified learning" OR "game based learning")

<https://www.scopus.com/results/results.uri?sort=plf->

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