

Supplementary Information

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1. Prisma 2020 Checklist

Supplementary Table 1. Prisma 2020 Checklist

Section and topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	3-4
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	4
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	16-17
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.	17
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	17 and Supplementary Table 2
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.	16-17
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.	17
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.	17-18
	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.	17-18

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.	19
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.	18-19
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)).	17-18
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	17-19
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	19
	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.	19
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	19
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	19
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	19
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	19
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.	5, Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	5, Figure 1
Study characteristics	17	Cite each included study and present its characteristics.	6-9, Table 1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	13
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.	11-12, Table 3

Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	13
	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.	10-12
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	10-13
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	10-13
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	13
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	13
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	14-15
	23b	Discuss any limitations of the evidence included in the review.	16
	23c	Discuss any limitations of the review processes used.	16
	23d	Discuss implications of the results for practice, policy, and future research.	16
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.	16
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	16
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	16
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	24
Competing interests	26	Declare any competing interests of review authors.	24-25
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.	19

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/>

2. Search methods

This meta-analysis was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 guidelines (Page et al., 2021). In collaboration with a medical information specialist, a comprehensive search was carried out in the bibliographic databases of PsycInfo, Medline, Embase, Web of Science Core Collection, and Scopus from inception to April 16th, 2025. The search strategy combined controlled vocabulary terms with free-text keywords related to passive data, psychopathology (including specific mental health symptoms and disorders), mobile phones, and adolescents. The search included a date filter from 1992 onwards, corresponding to the introduction of the first smartphone.

Supplementary Table 2. Search results

April 16th 2025

Database	Results
PsycInfo	405
Medline	632
Embase	991
Web of Science Core Collection	856
Scopus	977
Total	3860

Supplementary Table 3. Search Strategy PsycInfo

Ovid, APA PsycInfo, 1806 to April 2025 Week 1

Search	Key concept	Query – April 16 th 2025
#1	Passive data	mobile assessment/ OR screen time/ OR algorithms/ OR machine learning/ OR machine learning algorithms/ OR data mining/ OR (digital pheno* OR smartphone based passive OR phone based passive OR ((mobile phone* OR smartphone* OR phone OR phones OR iphone* OR passive) ADJ3 (data OR sensor* OR sensing OR tracking OR monitoring)) OR GPS OR accelerometer OR keystroke OR phone checking OR social media usage OR screen awakening* OR bluetooth OR mobile assessment OR screentime OR screen time OR linguistic markers OR algorithm* OR machine learning OR data mining OR mobile sensing).ti,ab,id.
#2	Psychopathology	emotional regulation/ OR mental health/ OR youth mental health/ OR mental disorders/ OR psychopathology/ OR adolescent psychopathology/ OR child psychopathology/ OR child psychiatry/ OR orthopsychiatry/ OR adolescent psychiatry/ OR exp attention deficit disorder/ OR exp behavior disorders/ OR conduct disorder/ OR behavior problems/ OR emotional trauma/ OR oppositional defiant disorder/ OR exp sleep wake disorders/ OR exp somatoform disorders/ OR attachment disorders/ OR exp separation anxiety/ OR aggressive behavior/ OR aggressiveness/ OR antisocial behavior/ OR acting out/ OR externalization/ OR internalization/ OR exp impulse control disorders/ OR affective disorders/ OR major depression/ OR "depression (emotion)"/ OR dysthymic disorder/ OR recurrent depression/ OR reactive depression/ OR bipolar disorder/ OR exp schizophrenia/ OR anxiety/ OR fear/ OR panic/ OR panic attack/ OR social anxiety/ OR social phobia/ OR anxiety disorders/ OR generalized anxiety disorder/ OR posttraumatic stress disorder/ OR acute stress disorder/ OR avoidant personality disorder/ OR antisocial personality disorder/ OR psychopathy/ OR exp psychosis/ OR loneliness/ OR neuroticism/ OR impulsiveness/ OR neurosis/ OR suicide/ OR youth suicide/ OR suicidality/ OR autism spectrum disorders/ OR (emotional dysregulation* OR emotional regulation* OR emotion management OR mental health OR mental disorder* OR psychiatric disorder* OR mental illness* OR mental health OR psychopathology OR psychiatr* OR orthopsychiatr* OR ADHD OR hyperactiv* disorder* OR attention deficit* OR conduct disorder* OR oppositional defiant disorder* OR ODD OR behavio* disorder* OR conduct problem* OR conduct disorder* OR behavior problem* OR attachment disorder* OR (disorder* ADJ3 (child* OR adolesc*)) OR internali* OR externali* OR psychosis OR psychotic* OR schizo* OR paranoid* OR mood disorder* OR depress* OR dysthymi* OR bipolar* OR hypomanic* OR manic* OR mania OR cyclothymic* OR anxiet* OR anxious* OR fear* OR fright* OR panic* OR worry OR worrie* OR social phobi* OR stress disorder* OR posttrauma* OR post-trauma* OR post trauma* OR psychotrauma* OR psycho-trauma* OR PTSD OR PTSS* OR ((trauma* OR stress*) ADJ2 disorder*) OR somatoform OR somatization OR somatisation OR somatic symptom disorder* OR psychosomatic disorder* OR dissociative OR (sleep* ADJ2 disorder*) OR dyssomnia* OR somni* OR hypersomn* OR insomni* OR impulse control

disorder* OR explosive disorder* OR adjustment disorder* OR personality disorder* OR borderline OR narcis* OR social engagement disorder* OR aggressi* OR antisocial* OR anti-social OR anti social OR assault OR burglary OR acting out OR aggressi* OR delinq* OR offending OR offenses OR suicid* OR oppositional OR behavi* difficult* OR ((defiant OR disruptive OR dysfunctional* OR explosiv* OR maladaptiv* OR problem*) ADJ3 (behavio* OR disorder*)) OR hyperactiv* OR misbehavio* OR misconduct OR affective disorder* OR affective symptom* OR mood disorder* OR avoidant personality OR psychopath OR callous OR unemotional* OR CU trait* OR C-U trait* OR loneliness OR autist* OR autism OR asperger OR peer problems OR social problem* OR neuroticism OR impulsiv* OR stressful* OR reexperienc* OR (life ADJ2 event*)).ti,ab,id.

#3 Mobile phones mobile phones/ OR smartphones/ OR (mobile phone* OR smartphone* OR phone OR phones OR iphone*).ti,ab,id.

#4 Adolescents (adolescence 13 17 yrs).ag. OR (young adulthood 18 29 yrs).ag. OR (teen* OR young* adult* OR young*people OR youngster* OR youth* OR minors* OR under ag* OR underag* OR juvenile* OR preadolesc* OR adolesc* OR child* OR student* OR preteen* OR middle schoolers OR high schoolers OR emerging adult*).ti,ab,id.

#5 1 AND 2 AND 3 AND 4

Note. Key: / = subject heading, ti = title, ab = abstract, id = key concepts (other keywords added by PsycInfo indexers to supplement the subject headings), ADJn = word distance of maximum n words, * = unlimited number of characters.

Supplementary Table 4. Search Strategy Medline

Ovid MEDLINE ALL, including Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily, 1946 to April 14, 2025.

Search	Key concept	Query – April 16 th 2025
#1	Passive data	screen time/ OR machine learning/ OR algorithms/ OR data mining/ OR (digital pheno* OR smartphone based passive OR phone based passive OR ((mobile phone* OR smartphone* OR phone OR phones OR iphone* OR passive) ADJ3 (data OR sensor* OR sensing OR tracking OR monitoring)) OR GPS OR accelerometer OR keystroke OR phone checking OR social media usage OR screen awakening* OR bluetooth OR mobile assessment OR screentime OR screen time OR linguistic markers OR algorithm* OR machine learning OR data mining OR mobile sensing).ti,ab,kf.
#2	Psychopathology	psychopathology/ OR child psychiatry/ OR orthopsychiatry/ OR adolescent psychiatry/ OR exp Attention Deficit and Disruptive Behavior Disorders/ OR problem behavior/ OR mental disorders/ OR exp sleep wake disorders/ OR exp somatoform disorders/ OR “Anxiety, Separation”/ OR aggression/ OR acting out/ OR exp mood disorders/ OR depression/ OR bipolar disorder/ OR adjustment disorders/ OR anxiety/ OR exp fear/ OR anxiety disorders/ OR antisocial personality disorder/ OR antisocial personality disorder/ OR exp “stress disorders, traumatic”/ OR “Stress, Psychological”/ OR “Anxiety, Separation”/ OR “Disruptive, Impulse Control, and Conduct Disorders”/ OR impulsive behavior/ OR “Phobia, social”/ OR psychotic disorders/ OR exp schizophrenia/ OR loneliness/ OR neuroticism/ OR neurotic disorders/ OR exp suicide/ OR autism spectrum disorder/ OR (emotional dysregulation* OR emotional regulation* OR emotion management OR mental health OR mental disorder* OR psychiatric disorder* OR mental illness* OR mental health OR psychopathology OR psychiatr* OR orthopsychiatr* OR ADHD OR hyperactiv* disorder* OR attention deficit* OR conduct disorder* OR oppositional defiant disorder* OR ODD OR behavio* disorder* OR conduct problem* OR conduct disorder* OR behavior problem* OR attachment disorder* OR (disorder* ADJ3 (child* OR adolesc*)) OR internal* OR external* OR psychosis OR psychotic* OR schizo* OR paranoid* OR mood disorder* OR depress* OR dysthymi* OR bipolar* OR hypomanic* OR manic* OR mania OR cyclothymic* OR anxiet* OR anxious* OR fear* OR fright* OR panic* OR worry OR worrie* OR social phobi* OR stress disorder* OR posttrauma* OR post-trauma* OR post trauma* OR psychotrauma* OR psycho-trauma* OR PTSD OR PTSS* OR ((trauma* OR stress*) ADJ2 disorder*) OR somatoform OR somatization OR somatisation OR somatic symptom disorder* OR psychosomatic disorder* OR dissociative OR (sleep* ADJ2 disorder*) OR dyssomnia* OR somni* OR hypersomn* OR insomni* OR impulse control disorder* OR explosive disorder* OR adjustment disorder* OR personality disorder* OR borderline OR narcis* OR social engagement disorder* OR aggressi* OR antisocial* OR anti-social OR anti social OR assault OR burglary OR acting out OR aggressi* OR delinq* OR offending OR offenses OR suicid* OR oppositional OR behavi* difficult* OR ((defiant OR disruptive OR dysfunctional* OR explosiv* OR maladaptiv* OR problem*) ADJ3 (behavio* OR disorder*)) OR hyperactiv* OR misbehavio* OR misconduct OR affective disorder* OR affective symptom* OR mood disorder* OR avoidant

		personality OR psychopath OR callous OR unemotional* OR CU trait* OR C-U trait* OR loneliness OR autist* OR autism OR asperger OR peer problems OR social problem* OR neuroticism OR impulsiv* OR stressful* OR reexperienc* OR (life ADJ2 event*).ti,ab,kf.
#3	Mobile phones	Cell phone/ OR smartphone/ OR (mobile phone* OR smartphone* OR phone OR phones OR iphone*).ti,ab,kf.
#4	Adolescents	Adolescent/ OR young adult/ OR child/ OR students/ OR (teen* OR young* adult* OR young*people OR youngster* OR youth* OR minors* OR under ag* OR underag* OR juvenile* OR preadolesc* OR adolesc* OR child* OR student* OR preteen* OR middle schoolers OR high schoolers OR emerging adult*).ti,ab,kf.
#5		1 AND 2 AND 3 AND 4

Note. Key: / = medical subject heading (MeSH), ti = title, ab = abstract, kf = author supplied keywords, ADJn = word distance of maximum n words, * = unlimited number of characters

Supplementary Table 5. Search Strategy Embase

Ovid, Embase Classic+Embase 1947 to 2025 April 14.

Search	Key concept	Query – April 16 th 2025
#1	Passive data	accelerometer/ OR screen time/ OR machine learning/ OR algorithm/ OR data mining/ OR (digital pheno* OR smartphone based passive OR phone based passive OR ((mobile phone* OR smartphone* OR phone OR phones OR iphone* OR passive) ADJ3 (data OR sensor* OR sensing OR tracking OR monitoring)) OR GPS OR accelerometer OR keystroke OR phone checking OR social media usage OR screen awakening* OR bluetooth OR mobile assessment OR screentime OR screen time OR linguistic markers OR algorithm* OR machine learning OR data mining OR mobile sensing).ti,ab,kf.
#2	Psychopathology	mental disease/ OR externalizing disorder/ OR internalizing disorder/ OR child psychiatry/ OR attention deficit hyperactivity disorder/ OR behavior disorder/ OR conduct disorder/ OR problem behavior/ OR psychotrauma/ OR oppositional defiant disorder/ OR exp sleep disorder/ OR exp somatoform disorder/ OR reactive attachment disorder/ OR psychosocial disorder/ OR separation anxiety/ OR aggression/ OR aggressiveness/ OR antisocial behavior/ OR acting out/ OR “externalization (behavior)”/ OR impulse control disorder/ OR impulsiveness/ OR exp mood disorder/ OR exp depression/ OR bipolar disorder/ OR anxiety/ OR fear/ OR panic/ OR social anxiety/ OR social phobia/ OR anxiety disorder/ OR generalized anxiety disorder/ OR posttraumatic stress disorder/ OR acute stress disorder/ OR avoidant personality disorder/ OR antisocial personality disorder/ OR psychopathy/ OR exp psychosis/ OR exp schizophrenia/ OR loneliness/ OR neurosis/ OR exp suicidal behavior/ OR autism/ OR asperger syndrome/ OR (emotional dysregulation* OR emotional regulation* OR emotion management OR mental health OR mental disorder* OR psychiatric disorder* OR mental illness* OR mental health OR psychopathology OR psychiatr* OR orthopsychiatr* OR ADHD OR hyperactiv* disorder* OR attention deficit* OR conduct disorder* OR oppositional defiant disorder* OR ODD OR behavio* disorder* OR conduct problem* OR conduct disorder* OR behavior problem* OR attachment disorder* OR (disorder* ADJ3 (child* OR adolesc*)) OR internali* OR externali* OR psychosis OR psychotic* OR schizo* OR paranoid* OR mood disorder* OR depress* OR dysthymi* OR bipolar* OR hypomanic* OR manic* OR mania OR cyclothymic* OR anxiet* OR anxious* OR fear* OR fright* OR panic* OR worry OR worrie* OR social phobi* OR stress disorder* OR posttrauma* OR post-trauma* OR post trauma* OR psychotrauma* OR psycho-trauma* OR PTSD OR PTSS* OR ((trauma* OR stress*) ADJ2 disorder*) OR somatoform OR somatization OR somatisation OR somatic symptom disorder* OR psychosomatic disorder* OR dissociative OR (sleep* ADJ2 disorder*) OR dyssomnia* OR somni* OR hypersomn* OR insomni* OR impulse control disorder* OR explosive disorder* OR adjustment disorder* OR personality disorder* OR borderline OR narcis* OR social engagement disorder* OR aggressi* OR antisocial* OR anti-social OR anti social OR assault OR burglary OR acting out OR aggressi* OR delinq* OR offending OR offenses OR suicid* OR oppositional OR behavi* difficult* OR ((defiant OR

		disruptive OR dysfunctional* OR explosiv* OR maladaptiv* OR problem*) ADJ3 (behavio* OR disorder*)) OR hyperactiv* OR misbehavio* OR misconduct OR affective disorder* OR affective symptom* OR mood disorder* OR avoidant personality OR psychopath OR callous OR unemotional* OR CU trait* OR C-U trait* OR loneliness OR autist* OR autism OR asperger OR peer problems OR social problem* OR neuroticism OR impulsiv* OR stressful* OR reexperienc* OR (life ADJ2 event*)).ti,ab,kf.
#3	Mobile phones	mobile phone/ OR smartphone/ OR (mobile phone* OR smartphone* OR phone OR phones OR iphone*).ti,ab,kf.
#4	Adolescents	adolescent/ OR child/ OR school child/ OR young adult/ OR exp student OR (teen* OR young* adult* OR young*people OR youngster* OR youth* OR minors* OR under ag* OR underag* OR juvenile* OR preadolesc* OR adolesc* OR child* OR student* OR preteen* OR middle schoolers OR high schoolers OR emerging adult*).ti,ab,kf.
#5		1 AND 2 AND 3 AND 4

Note. Key: / = EMTREE subject heading, ti = title, ab = abstract, kf = author supplied keywords, ADJn = word distance of maximum n words

Supplementary Table 6. Search Strategy Web of Science Core Collection

Web of Science Core Collection Editions: Science Citation Index Expanded (SCI-EXPANDED), 1975 - present, Social Sciences Citation Index (SSCI), 1975 - present, Arts & Humanities Citation Index (A&HCI), 1975 - present, Emerging Sources Citation Index (ESCI), 2005 - present).

Search	Key concept	Query – April 16 th 2025
#1	Passive data	TS=("digital pheno*" OR "smartphone based passive" OR "phone based passive" OR (("mobile phone*" OR "smartphone*" OR "phone" OR "phones" OR "iphone*" OR "passive") NEAR/2 ("data" OR "sensor*" OR "sensing" OR "tracking" OR "monitoring"))) OR "GPS" OR "accelerometer" OR "keystroke" OR "phone checking" OR "social media usage" OR "screen awakening*" OR "bluetooth" OR "mobile assessment" OR "screentime" OR "screen time" OR "linguistic markers" OR "algorithm*" OR "machine learning" OR "data mining" OR "mobile sensing")
#2	Psychopathology	TS=("emotional dysregulation*" OR "emotional regulation*" OR "emotion management" OR "mental health" OR "mental disorder*" OR "psychiatric disorder*" OR "mental illness*" OR "mental health" OR "psychopathology" OR "psychiatr*" OR "orthopsychiatr*" OR "ADHD" OR "hyperactiv* disorder*" OR "attention deficit*" OR "conduct disorder*" OR "oppositional defiant disorder*" OR "ODD" OR "behavio* disorder*" OR "conduct problem*" OR "conduct disorder*" OR "behavior problem*" OR "attachment disorder*" OR ("disorder*" NEAR/2 ("child*" OR "adolesc*")) OR "internali*" OR "externali*" OR "psychosis" OR "psychotic*" OR "schizo*" OR "paranoid*" OR "mood disorder*" OR "depress*" OR "dysthymi*" OR "bipolar*" OR "hypomanic*" OR "manic*" OR "mania" OR "cyclothymic*" OR "anxiet*" OR "anxious*" OR "fear*" OR "fright*" OR "panic*" OR "worry" OR "worrie*" OR "social phobi*" OR "stress disorder*" OR "posttrauma*" OR "post-trauma*" OR "post trauma*" OR "psychotrauma*" OR "psycho-trauma*" OR "PTSD" OR "PTSS*" OR (("trauma*" OR "stress*") NEAR/1 "disorder*") OR "somatoform" OR "somatization" OR "somatisation" OR "somatic symptom disorder*" OR "psychosomatic disorder*" OR "dissociative" OR ("sleep*" NEAR/1 "disorder*") OR "dyssomnia*" OR "somni*" OR "hypersomn*" OR "insomni*" OR "impulse control disorder*" OR "explosive disorder*" OR "adjustment disorder*" OR "personality disorder*" OR "borderline" OR "narcis*" OR "social engagement disorder*" OR "aggressi*" OR "antisocial*" OR "anti-social" OR "anti social" OR "assault" OR "burglary" OR "acting out" OR "aggressi*" OR "delinq*" OR "offending" OR "offenses" OR "suicid*" OR "oppositional" OR "behavi* difficult*" OR (("defiant" OR "disruptive" OR "dysfunctional*" OR "explosiv*" OR "maladaptiv*" OR "problem*") NEAR/2 ("behavio*" OR "disorder*")) OR "hyperactiv*" OR "misbehavio*" OR "misconduct" OR "affective disorder*" OR "affective symptom*" OR "mood disorder*" OR "avoidant personality" OR "psychopath" OR "callous" OR "unemotional*" OR "CU trait*" OR "C-U trait*" OR "loneliness" OR "autist*" OR "autism" OR "asperger" OR "peer problems" OR "social problem*" OR "neuroticism" OR "impulsiv*" OR "stressful*" OR "reexperienc*" OR ("life NEAR/1 event*"))
#3	Mobile phones	TS=("mobile phone*" OR "smartphone*" OR "phone" OR "phones" OR "iphone*")

#4	Adolescents	TS=("teen*" OR "young* adult*" OR "young* people" OR "youngster*" OR "youth*" OR "minors*" OR "under ag*" OR "underag*" OR "juvenile*" OR "preadolesc*" OR "adolesc*" OR "child*" OR "student*" OR "preteen*" OR "middle schoolers" OR "high schoolers" OR "emerging adult*")
#5		#1 AND #2 AND #3 AND #4

Note. Key: TS = topic, which includes title, abstract, author keywords and Web of Science Keywords Plus, NEAR/n = word distance of maximum n words, * = unlimited number of characters

Supplementary Table 7. Search Strategy Scopus
Elsevier, 1788-2025

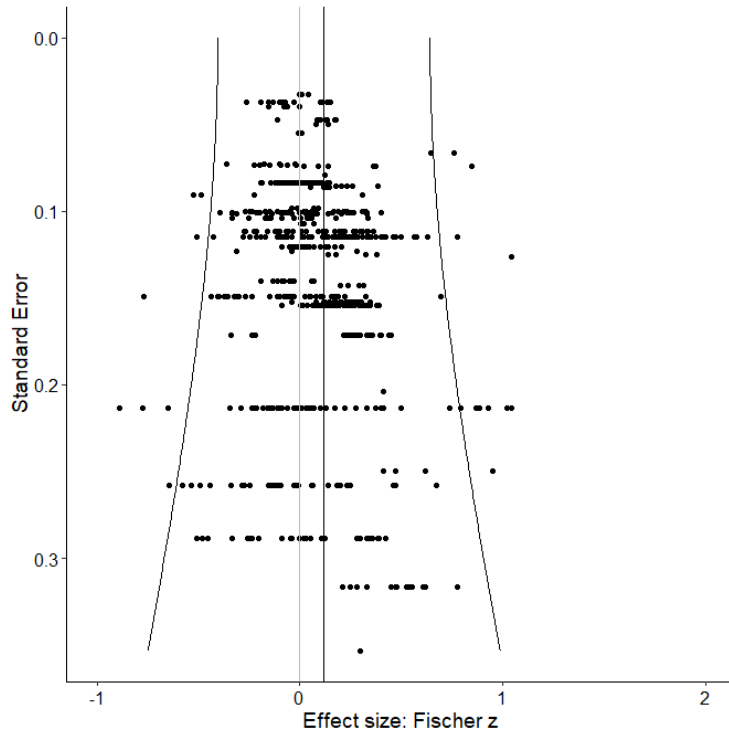
Search	Key concept	Query – April 16 th 2025
#1	Passive data	TITLE-ABS-KEY("digital pheno*" OR "smartphone based passive" OR "phone based passive" OR ("mobile phone*" OR smartphone* OR phone OR phones OR iphone* OR passive) NEAR/2 (data OR sensor* OR sensing OR tracking OR monitoring)) OR GPS OR accelerometer OR keystroke OR "phone checking" OR "social media usage" OR "screen awakening*" OR bluetooth OR "mobile assessment" OR screentime OR "screen time" OR "linguistic markers" OR algorithm* OR "machine learning" OR "data mining" OR "mobile sensing")
#2	Psychopathology	TITLE-ABS-KEY("emotional dysregulation*" OR "emotional regulation*" OR "emotion management" OR "mental health" OR "mental disorder*" OR "psychiatric disorder*" OR "mental illness*" OR "mental health" OR psychopathology OR psychiatr* OR orthopsychiatr* OR ADHD OR "hyperactiv* disorder*" OR "attention deficit*" OR "conduct disorder*" OR "oppositional defiant disorder*" OR ODD OR "behavio* disorder*" OR "conduct problem*" OR "conduct disorder*" OR "behavior problem*" OR "attachment disorder*" OR (disorder* W/2 (child* OR adolesc*)) OR internali* OR externali* OR psychosis OR psychotic* OR schizo* OR paranoid* OR "mood disorder*" OR depress* OR dysthymi* OR bipolar* OR hypomanic* OR manic* OR mania OR cyclothymic* OR anxiet* OR anxious* OR fear* OR fright* OR panic* OR worry OR worrie* OR "social phobi*" OR "stress disorder*" OR posttrauma* OR post-trauma* OR "post trauma*" OR psychotrauma* OR psycho-trauma* OR PTSD OR PTSS* OR ((trauma* OR stress*) W/1 disorder*) OR somatoform OR somatization OR somatisation OR "somatic symptom disorder*" OR "psychosomatic disorder*" OR dissociative OR (sleep* W/1 disorder*) OR dyssomnia* OR somni* OR hypersomn* OR insomni* OR "impulse control disorder*" OR "explosive disorder*" OR "adjustment disorder*" OR "personality disorder*" OR borderline OR narcis* OR "social engagement disorder*" OR aggressi* OR antisocial* OR anti-social OR "anti social" OR assault OR burglary OR "acting out" OR aggressi* OR delinq* OR offending OR offenses OR suicid* OR oppositional OR "behavi* difficult*" OR ((defiant OR disruptive OR dysfunctional* OR explosiv* OR maladaptiv* OR problem*) W/2 (behavio* OR disorder*)) OR hyperactiv* OR misbehavio* OR misconduct OR "affective disorder*" OR "affective symptom*" OR "mood disorder*" OR "avoidant personality" OR psychopath OR callous OR unemotional* OR "CU trait*" OR "C-U trait*" OR loneliness OR autist* OR autism OR asperger OR "peer problems" OR "social problem*" OR neuroticism OR impulsiv* OR stressful* OR reexperient* OR (life W/1 event*))
#3	Mobile phones	TITLE-ABS-KEY("mobile phone*" OR "smartphone*" OR {phone} OR {phones} OR iphone*)

#4	Adolescents	TITLE-ABS-KEY(teen* OR "young* adult*" OR "young* people" OR youngster* OR youth* OR minors* OR "under ag*" OR underag* OR juvenile* OR preadolesc* OR adolesc* OR child* OR student* OR preteen* OR "middle schoolers" OR "high schoolers" OR "emerging adult*")
#5		#1 AND #2 AND #3 AND #4

Note. Key: TITLE-ABS-KEY: TITLE = title, ABS = abstract, KEY = a combined field that searches author supplied keywords, Emtree subject headings, other keywords, trade names and chemical names, W/n = word distance of maximum n words, {} = wildcard for exact searching (cannot be combined with W/n)

3. Funnel plots

Supplementary Figure 1. Funnel plot within (individual) study effects sizes



Supplementary Figure 2. Funnel plot between (mean) study effects

