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Emotion regulation and cannabis use in young people: a systematic review

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Introduction: Cannabis is the most widely used illicit drug among young people and is frequently associated with mental health problems. Emotion regulation, the ability to monitor, evaluate, and modulate emotional responses, has been proposed as a mechanism linking cannabis use with psychopathology, but evidence remains inconsistent.
Objectives: This review systematically examined studies investigating the association between cannabis use and self-reported emotion regulation in adolescents and young adults using validated self-report measures.
Methods: The review was registered with PROSPERO (CRD42024562206) and funded by the Health Research Board. Six electronic databases were searched to June 2025. Eligible studies included participants aged 12–30 years, included a comparison group of non-users or infrequent users, and reported at least one validated measure of emotion regulation (Emotion Regulation Questionnaire, Difficulties in Emotion Regulation Scale, or Cognitive Emotion Regulation Questionnaire). Risk of bias was assessed using the ROBINS-E tool, and findings were narratively synthesised.
Results: Only four cross-sectional studies ($N = 3,801$) met inclusion criteria. Cannabis use was associated with greater emotion regulation difficulties, although results were limited and heterogeneous, with one paper contributing largely to the overall sample size. The most consistent domains implicated were impulse control, goal-directed behaviour, and non-acceptance of emotions, with one study identifying effects limited to females.
Discussion: Preliminary evidence, whilst limited, suggests that cannabis use during adolescence and early adulthood is associated with specific emotion regulation difficulties rather than global dysregulation. However, given the limited sample of eligible studies, results should be observed with caution. Longitudinal and neurocognitive studies are needed to clarify causal mechanisms and inform prevention and intervention efforts.

Systematic Review Registration: https://www.crd.york.ac.uk/PROSPERO/view/CRD42024562206, PROSPERO CRD42024562206.

KEYWORDS
adolescence, cannabis, emotion regulation, review, social cognition

Introduction

Cannabis is the most widely used illicit drug in Europe, with an estimated global prevalence of around 8%, or 23 million people aged 16–64 reporting past-year use (1, 2). Around one in five users develop cannabis use disorder (CUD), contributing significantly to the overall health burden (3, 4). CUD is frequently comorbid with depression, anxiety, conduct problems, and psychosis, particularly in adolescence (4–8). Of particular concern, frequent cannabis use is associated with psychosis, with high-potency cannabis estimated to account for 12% of first-episode psychosis presentations (9).

Although the epidemiological association between cannabis use and psychopathology is well documented, the underlying cognitive mechanisms and directional pathways remain unclear. Cannabis users consistently show poorer performance on executive functioning tasks, especially when use begins in adolescence (10–12). However, higher-order affective control processes, particularly emotion regulation, have been examined far less (13). Emotion regulation, defined as the ability to monitor, evaluate, and modulate emotional responses in line with contextual demands (14–16), depends on core executive functions such as working memory, inhibitory control, and cognitive flexibility. It is also recognised as a transdiagnostic process implicated across diverse psychopathologies, shaping how cognitive control systems interact with affective and motivational states (17–19).

There is some evidence that emotional difficulties (including processing, recognition and regulation), co-occur with cannabis use but the breadth and consistency of this association remain unclear (13, 20, 21), particularly during adolescence, a developmental stage characterised by heightened neurocognitive plasticity and emotional variability (22). A comprehensive meta-analysis of youth cannabis users, and associated cognition deficits, including over sixty articles, reported small deficits in executive functioning, learning, and memory, that largely dissipated with abstinence. However, the meta-analysis did not extend to emotion regulation specifically (23). Other reviews have addressed emotion recognition, regulation, or stress reactivity in isolation, without integrating these domains or considering moderators such as cannabis related co-use, sex, psychiatric comorbidity, and emotional valence (13, 24). Qualitative evidence offers another viewpoint, with adolescent cannabis use often expressing significant insights into familial and peer relationship harms, avoidance of social interactions outside of cannabis related activities (25), and escalated conduct issues such as physical violence (26, 27).

However, there is no prior systematic review specifically examining how cannabis use relates to emotion regulation in youth using validated self-reported measures. Although other validated modalities exist (i.e., carer-report, behavioural paradigms, or physiological indices), these approaches often operationalise partially distinct constructs and are methodologically heterogeneous, limiting direct across-study comparability within a systematic synthesis. Against this background, we aimed to systematically examine existing evidence on the association between cannabis use and self-reported perceived emotion regulation in adolescents and young adults, with the aim to map affected domains and subdomain patterns.

Methods and materials

Protocol and registration

This review followed PRISMA 2020 guidelines and was prospectively registered on PROSPERO (ID: CRD42024562206). The preregistered protocol, including any deviations, is available on the PROSPERO record.

Search strategy

Systematic searches of PubMed, PsycINFO, Web of Science, CINAHL, Embase, and Scopus were created in collaboration with a Librarian from the Royal College of Surgeons in Ireland. Searches were conducted in all databases from inception to June 2025. Search terms combined controlled vocabulary and free-text keywords for cannabis and cannabis use disorder, adolescence and young adulthood, and emotion regulation, including the names of key instruments. Full search strings and Boolean operators are reported in Supplementary Tables. No restrictions were defined. Reference lists of included articles were hand-searched to identify additional eligible studies. Records were managed and screened using Covidence software, and the selection process is summarised in the PRISMA flow diagram (Figure 1).

Eligibility criteria

To be eligible for inclusion, articles should include: (1) participants aged 12–30 years, in line with topological developmental milestones (28) (2) participants reporting Cannabis Use Disorder (CUD), chronic cannabis use, self-reported use, or enrolled in treatment for CUD. Cannabis use could be reported through self-report, clinical interview, or previous diagnosis. Where cannabis was included in co-use or polysubstance use, articles would be included and data extracted e.g., cannabis and alcohol (3) a comparison or reference group of cannabis-naïve, infrequent users, or healthy controls. Infrequent users were defined as use on 1–2 of the past 30 days (29) (4) report at least one validated self-report measure of emotion regulation (these tools were prespecified through *a priori* literature review, as they are extensively validated and capture complementary aspects of emotion regulation, acknowledging that this criterion may have reduced the scope of eligible evidence):

- Emotion Regulation Questionnaire (ERQ) is ten item self-report questionnaire that contains two subcomponents; cognitive reappraisal and expressive suppression. Six items correspond to cognitive reappraisal, while four relate to expressive suppression (30, 31).
- Difficulties in Emotion Regulation Scale (DERS) is a thirty-six item self-report questionnaire that assesses six subscales of emotion regulation: nonacceptance, goals, strategies, clarity, impulsivity and awareness. Higher scores indicate more difficulties in regulating one's emotions (32).

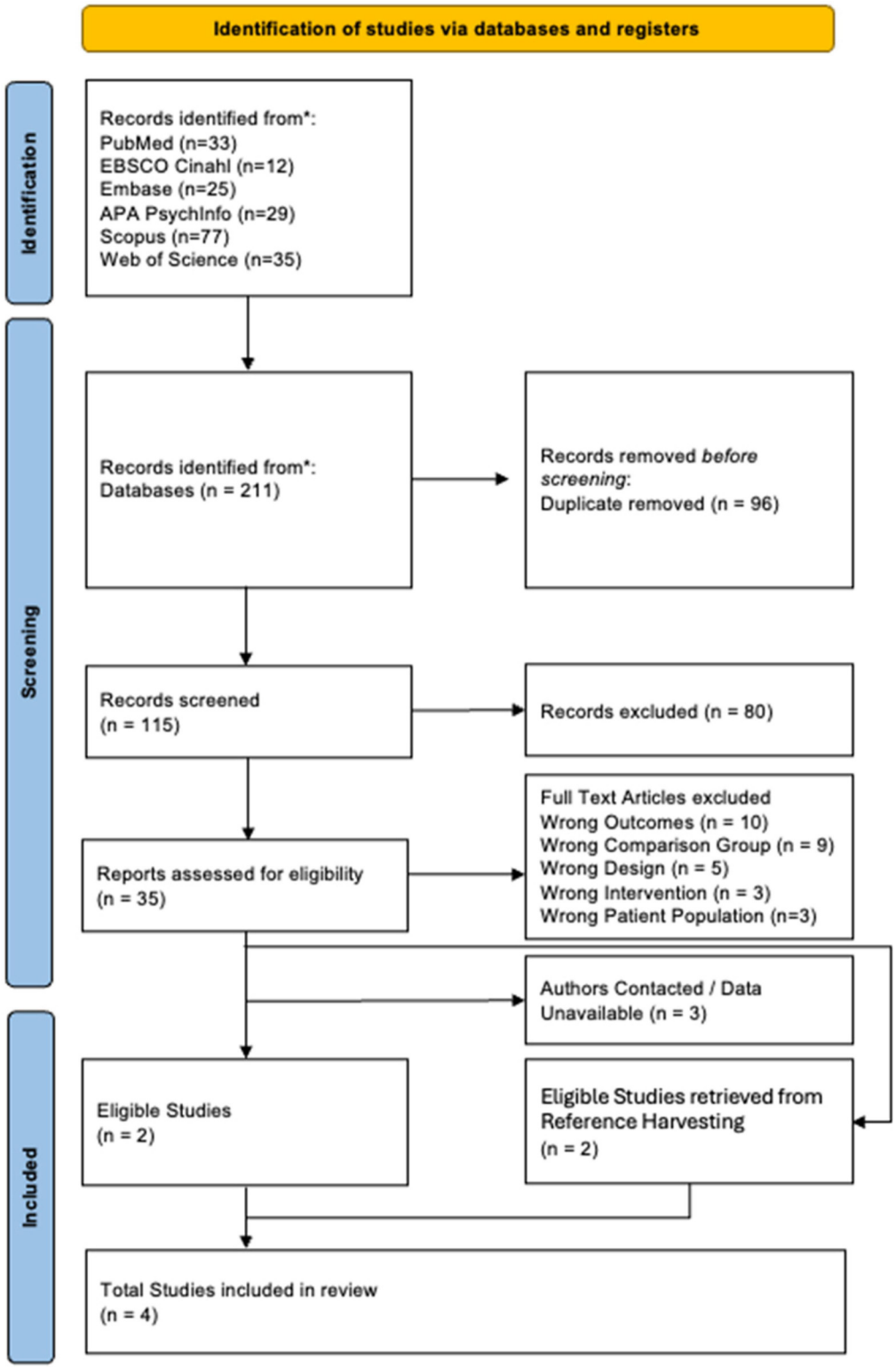

FIGURE 1
Full PRISMA flow diagram.

- Cognitive Emotion Regulation Questionnaire (CERQ) is a thirty-six item self-report questionnaire which consists of nine subscales of emotion regulation: acceptance, positive refocusing, refocusing on planning, positive reappraisal, putting into perspective, rumination, catastrophizing, self-blame, other blame. Higher scores indicate more difficulties in regulating one's emotions (33).

Studies were excluded if they (1) lacked a cannabis-use group as mentioned previously (2) lacked any form control or reference

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group (3) relied on qualitative or case-report designs, (4) did not report any of the prespecified outcomes.

Study selection and data extraction

Two blinded reviewers (FOH and ANA) independently screened titles, abstracts, and full texts against eligibility criteria using Covidence. Discrepancies were resolved through discussion and consensus with senior authors (SR and RF). Data were extracted using a piloted template (see Supplementary Material Table S2) that included study design, setting, sample size, participant characteristics, cannabis exposure definitions, control group details, emotion regulation instruments, and summary statistics. Discrepancies were resolved through discussion and consensus with senior authors (SR and RF). When available, information on method of cannabis consumption and comorbid psychiatric diagnoses was also extracted.

Risk of bias assessment

Risk of bias was assessed using the Cochrane Risk of Bias in Non-randomized Studies of Exposures (ROBINS-E) tool across seven domains relevant to observational exposure outcome studies (34). Two reviewers (FOH and ANA) conducted independent assessments, with disagreements resolved by consensus. Three studies were judged at high or very high risk, mainly due to reliance on self-reported cannabis exposure and limited adjustment for confounding, and one study was rated low risk. These ratings informed interpretation but did not determine inclusion.

Evidence synthesis

A structured narrative synthesis was therefore undertaken, grouping findings by instrument and evaluating the associations, including sex and domain-specific effects and study-level risk of bias. For one study (35), raw data available via the Open Science Framework was re-analysed to obtain comparable summary statistics for DERS scores. These values were used strictly to align reporting across studies. The review followed the preregistered protocol without deviations.

Results

Characteristics of included studies

Table 1 presents the characteristics of the four included studies examining the association between cannabis use and emotion regulation as defined in the inclusion criteria. A total of 3,801 participants were included, with sample sizes ranging from 43 to 2,762 and a mean age of approximately 20 years (range 18–29). Across the four studies, 2,073 participants were female. Three samples were drawn from university settings and one from an online survey. Several distinct methods of cannabis engagement

TABLE 1 Characteristics of included studies.

Included article	Outcome	Country	Cannabis Definition	N	Users Mean ± range	% Female	Comparator Group	N	Comparators Mean ± Range	%Female
Akbari et al. (2021) (36)	ERQ	Iran	SCID-5	48	22.73 (18–29)	48%	Non-CUD	48	24.04 (18–29)	58%
Cavalli and Cservenka (2021) (37)	DERS	USA	Frequent users	443	26.88	47%	Infrequent users	409	26.88	47%
Stone (2024) (35)	DERS	USA	Frequent users	26	18.64 (18–22)	73%	Infrequent users	17	18.5 (18–22)	82%
Weidberg et al. (2023) (38)	DERS	Spain	Past-month use & CUDIT	318	19.47	53%	Infrequent use/Abstinence	2,444	19.47	64%

Values represent sample characteristics for cannabis use and comparison groups as reported by each study, using all available data where possible to present comparable characteristics. Stone (35) reported open access data, and data was extracted as necessary (FOH). Age values are expressed as mean (range) where available. "% Female" indicates the proportion of female participants within each group. CUD, cannabis use disorder; CUDIT, cannabis use disorders identification test; DERS, difficulties in emotion regulation scale; ERQ, emotion regulation questionnaire; SCID-5, structured clinical interview for DSM-5.

were included, specifically the SCID-5 ($n = 1$), the Marijuana Problem Scale ($n = 1$), the Cannabis Use Disorders Identification Test ($n = 1$), or frequency of use ($n = 1$). One study specifically investigated inhaled cannabis (Weidberg et al. (38)); the remaining three did not specify route of administration. Emotion regulation measures included the DERS ($n = 3$) and the ERQ ($n = 1$). Further details can be found in Table 1.

Risk of bias

Three studies were rated high or very high risk, largely due to reliance on self-reported cannabis exposure and limited control for confounding variables, while one study was rated low risk. Further details can be found in Figure 2.

Evidence synthesis

Emotion regulation questionnaire (ERQ)

Akbari et al. (36) examined 144 Iranian university students (mean age 23 years) divided into three groups: a cannabis use disorder group, a problematic internet use group, and a non-affected comparison group. Cannabis users reported significantly lower cognitive reappraisal scores than both comparison groups. Expressive suppression also differed across the three groups, although group differences were larger for cognitive reappraisal than for expressive suppression. Although exact standardised effect sizes were not reported, the magnitude of the differences in cognitive reappraisal appeared moderate relative to expressive suppression. The emphasis on reappraisal is consistent with the fact that this subscale captures a more specific regulatory capacity. The findings indicated an association between reappraisal score and cannabis use. While the pattern observed for suppression was present but less decisive in distinguishing groups.

Difficulties in emotion regulation scale (DERS)

Weidberg et al. (38) studied 2,762 Spanish undergraduates (mean age 19.5 years). Higher global dysregulation scores were observed among cannabis users. However, statistically significant associations were confined to women. Group differences were concentrated in non-acceptance of emotional responses, impulse control difficulties, reduced goal directed behaviour, and lower emotional clarity. Given the large sample size, the observed group differences likely reflect small-to-moderate effects. Mediation analyses indicated that DERS scores statistically mediated the associations between past-month cannabis use and emotional distress in woman. No comparable effects appeared in men. Given the large sample, the absence of associations in men is unlikely to reflect low power and instead suggests that, in this cohort, cannabis use and reported emotion regulation difficulties aligned more strongly among women. The cross sectional nature of the data limits any conclusions about temporal direction.

Cavalli and Cservenka (37) assessed 852 adults in the United States (mean age 26.9 years). Participants reported varying levels of cannabis involvement, ranging from no recent use to frequent use and differing burdens of cannabis related problems. The authors examined whether emotion regulation difficulties moderated the association between recent stress and cannabis related problems. Higher DERS scores were associated with greater cannabis-related consequences at higher levels of stress. Because the sample included individuals with a wide range of stress-related experiences, the findings reflect variability within a general cohort. The moderation is statistically clear, suggesting a

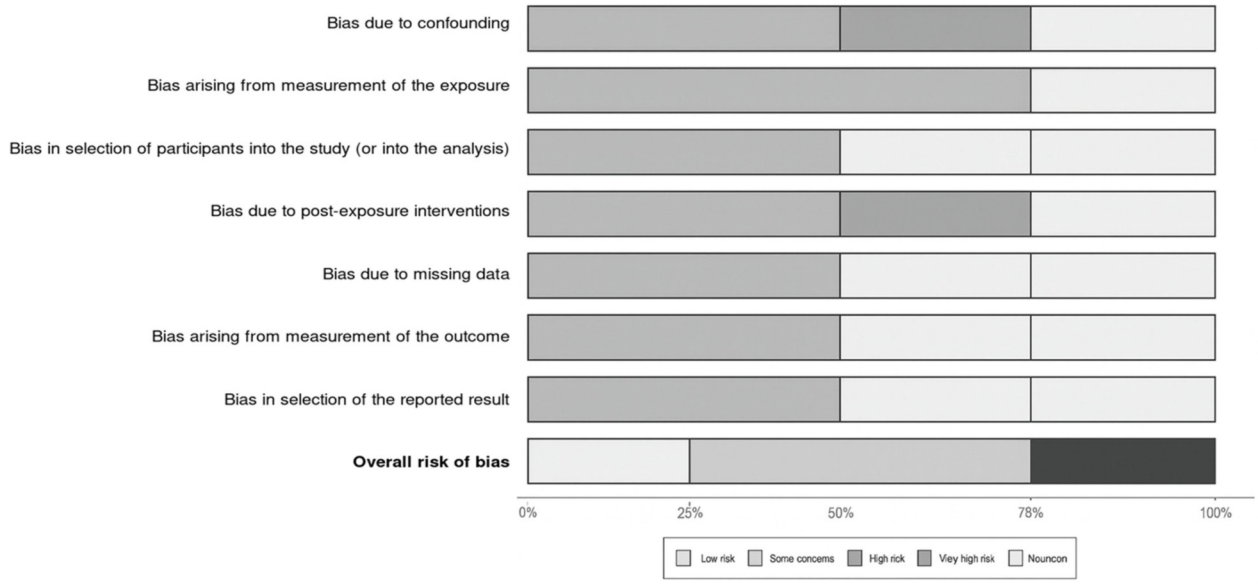

FIGURE 2
Risk of bias bar chart. Summary of risk of bias across all included studies, assessed using the ROBINS-E tool. Each bar represents the proportion of studies judged at different levels of bias within each domain. Darker shading indicates higher risk of bias, lighter shading indicates lower risk or no information.

modest but meaningful interaction between emotion regulation and stress. However, given the cross sectional design, it cannot be determine whether stress, dysregulation, and problem severity share underlying variance that contributes to the observed pattern.

Stone (35) examined emotion regulation in 198 undergraduates (mean age 19.2 years). For the purposes of this review, analyses focused on the subset of participants with available cannabis-use data ($n = 43$), as reported in Table 1, assessing the validity of a newly developed substance-use attitudes scale. Although descriptive patterns suggested that students with stronger positive substance-use expectancies and heavier involvement, including cannabis use, tended to show higher DERS scores, these trends did not reach statistical significance. DERS total scores did not differ significantly between cannabis using participants and healthy controls. None of the six DERS subscales showed significant group differences. This may reflect limited statistical power and variability within a young, undergraduate sample, where differences in cannabis involvement and emotion regulation are subtle. Nevertheless, the descriptive pattern situates emotion regulation difficulties within the broader constellation of cannabis-related attitudes and behaviours in this age range.

Cross-study patterns

Across the four studies, difficulties in emotion regulation were most frequently observed in domains of impulse control, non-acceptance of emotions, goal-directed behaviour, and emotional clarity. Across studies, the magnitude of associations appears constantly modest, suggesting small-to-moderate relationships. Akbari et al. (36) also reported reduced cognitive reappraisal among cannabis users on the ERQ. The three DERS-based studies differed in their objectives and in how they defined cannabis involvement, but reported higher DERS scores among cannabis-using participants (Figure 3). Two studies identified non-significant findings: Stone (35) noted observational trends toward higher DERS scores among cannabis-using students, although these did not reach statistical significance, and Weidberg et al. (38) found that several associations between cannabis use and individual DERS subscales were non-significant. In the same study, significant associations were evident only among woman, while Cavalli and Cservenka (37) reported that the association between emotion dysregulation and cannabis problems was moderated by stress. Across studies, variability was evidence in study aims, definitions of cannabis involvement, and sample characteristics.

Interpretation

The studies indicate that young adults who use cannabis or report heavier involvement tend to report difficulties in several dimensions of emotion regulation, including reduced cognitive reappraisal and elevations in DERS domains relating to non-acceptance, impulse control, goal directed behaviour, and emotional clarity. Given the shared methodological limitations, reduced ability to further satisfied analyses, and age-related heterogeneity, these findings should be interpreted as strictly associations, and it remains unclear whether emotion regulation differences precede cannabis involvement, arise from it, or reflect underlying characteristics common to both.

Discussion

This review provides a preliminary synthesis of evidence on the association between cannabis use and emotion regulation in

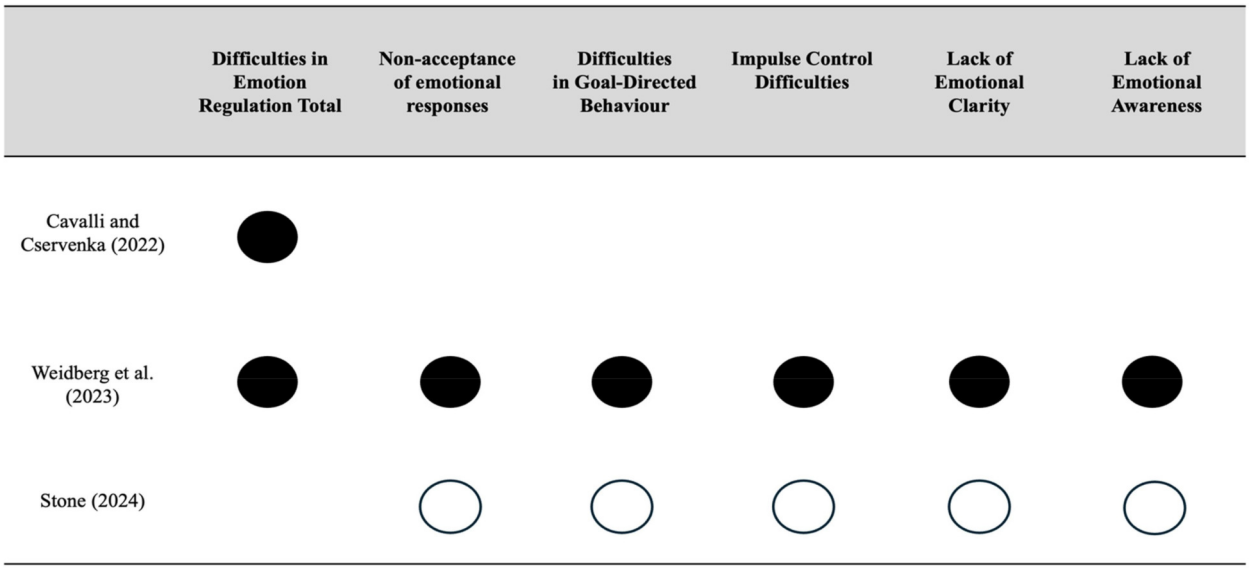

FIGURE 3
Reporting of DERS across studies. Filled circles indicate statistically significant associations (based on reported *p*-values); hollow circles indicate non-significant associations. Cavalli and Cservenka (37) reported only DERS total scores. Weidberg et al. (38) reported associations across all DERS subscales. Stone (35) observed trends toward higher DERS scores that did not reach significance. Variability in reporting practices precluded meta-analysis.

adolescents and young adults. To our knowledge, it is the first systematic review to examine this relationship using validated self-report measures of perceived emotion regulation. We only identified four studies which met criteria, most of which were identified as at high/very high risk of bias. Therefore, our studies findings should be interpreted cautiously. Across the included studies, cannabis involvement was associated with greater emotion regulation difficulties, particularly in reappraisal, impulse control, and related domains. However, evidence is limited. Akbari et al. (36), and Cavalli and Cservenka (37) reported significant associations or interactions involving regulation difficulties and cannabis use. In contrast, Stone (35) reported observational, yet non-significant associations, and Weidberg et al. (38) observed associations only among women, with no effect in male participants. As sex differences were identified within a single large scale study, it remains unclear whether this reflects sample-specific cross-variation, measurement environment or a more generalised pattern requiring more extensive investigation. However, these findings point to a broadly consistent directional trend but also likely influence of non-investigated moderating factors such as individual differences, sociocultural economic status and co-morbid mental health conditions.

Within the literature, particular ways of managing emotions, such as rumination, avoidance, and suppression, are consistently associated with greater symptom severity in depression and anxiety, whereas strategies like reappraisal and acceptance tend to relate to resilience and better mental health outcomes (39). Current evidence suggests that it is not a general inability to regulate emotions that contributes to psychological difficulties, but rather a tendency to rely too heavily on these maladaptive responses, which can increase vulnerability to mental health problems (40). Emotion regulation difficulties appear relevant to substance use as well. Among cannabis users, such difficulties have been linked to elevated depression and anxiety symptoms, particularly among females (38).

Despite the small number of studies, several tentative patterns emerged. Difficulties with impulse control, non-acceptance of emotions, and goal-directed behaviour were the most recurrent domains implicated. These specific aspects of regulation appear more consistently linked with cannabis use than global dysregulation, suggesting a specific pattern rather than a generalised deficit. As noted above, qualitative evidence suggests adolescent cannabis users often face significant familial and peer relationship harms, as well as escalated conducted issues such as physical violence (26, 27). As all included studies used validated measures such as the DERS and ERQ, the observed associations likely reflect recognized constructs of emotion regulation rather than generic emotional distress. Collectively, these findings provide preliminary support for the theoretical idea that emotion regulation may be a transdiagnostic mechanism through which cognitive-affective control processes intersect with substance-use vulnerability, however longitudinal and experimental evidence is required to strengthen claims.

These emerging patterns theoretically fit within broader research showing that frequent cannabis use is associated with subtle deficits in executive functioning, particularly working memory and inhibition, core processes underpinning emotion regulation (23). Neuroimaging studies outside this review also report altered activation in prefrontal and anterior cingulate regions among regular users (41, 42). Although no included studies assessed neurocognition correlates, these findings across literatures strengthen the potential and theoretical plausibility that emotion regulation difficulties may stem from disruptions in control systems involved in both cognition and affect (43). Importantly, the consistency of findings across different samples and instruments suggests that the association, though modest and limited, is unlikely to be artefactual. At the same time, and although our search strategy was broad, the evidence base remains methodologically constrained. None of the included studies examined emotion regulation in the context of polysubstance use, despite cannabis frequently co-occurring with alcohol, nicotine, and stimulants in this age group (44), suggesting a new approach to substance use research (45). No studies reported or controlled for psychiatric comorbidity, even though depression, anxiety, and attention-deficit disorders are independently associated with emotion dysregulation (46). Furthermore, no studies incorporated multimodal neurocognitive, behavioural or indeed imaging investigations of emotion regulation within cannabis use, using the prespecified measures. The lack of such data ultimately limits interpretation, meaning the observed associations could reflect a broader emotional vulnerability rather than cannabis-specific processes. The reliance on cross-sectional, self-report designs prevents determination of causality, whether emotion regulation difficulties precede use, emerge as a consequence, or develop over time. Variation in how cannabis exposure was defined, reported, the absence of potency or cumulative-use data, and a dependence on university-based convenience samples further restrict generalisability, and interpretation of this review findings. Future research should consider the above, in order to produce robust and generalisable findings.

Even within these constraints, the association between cannabis use and specific regulation difficulties was replicated in all four studies and may suggest the potential clinical and developmental relevance of emotion regulation as a target for prevention and intervention. The findings are consistent with cognitive-affective models (30, 31) which suggest that cannabis may theoretically function as a maladaptive strategy to manage distress or suppress unwanted emotions. Interventions that enhance regulatory flexibility, such as reappraisal training, mindfulness-based relapse prevention, or structured emotion regulation skills programmes, could therefore improve coping and reduce reliance on cannabis during adolescence and early adulthood. There is a need for more research, using a broader range of measurements, and in longitudinal studies, to evaluate the consistency of these associations.

Strengths and limitations

The main strength of this review lies in its rigorous operationalisation of emotion regulation. Only studies employing validated instruments such as the DERS, CERQ, and ERQ were included, enabling meaningful comparison across samples and reducing methodological variability. The developmental focus on adolescents and young adults (ages 12–30) captures a critical window in which both emotion regulation

and substance-use behaviours are still developing, making the findings particularly relevant to prevention and early intervention strategies. Several limitations qualify the strength of these conclusions. The small number of eligible studies constrains the strength of inference and precludes detailed examination of moderators such as age of onset, duration, and frequency of use. Definitions of cannabis exposure varied widely across studies, preventing assessment of dose-response relationships or the timing of emotion regulation changes relative to use. Comparators were inconsistently defined, there is no standard definition of cannabis or substance-naïve participants. Restricting inclusion to these three widely validated measures ensured conceptual comparability but limited the number of eligible studies. Moreover, all included studies were cross-sectional, limiting causal interpretation and leaving open whether emotion regulation difficulties act as precursors, consequences, or reciprocally maintained features of cannabis use.

Conclusion

Taken together, the evidence suggests that cannabis use during adolescence and young adulthood is associated with greater difficulties in emotion regulation, particularly in domains of impulse control, goal-directed behaviour, and non-acceptance of emotions. Although findings were not uniform, the overall pattern is consistent with the possibility that emotion regulation difficulties contribute to the complex interplay between cannabis use and mental health. These results underscore the importance of viewing emotion regulation as a potential psychosocial mechanism relevant to both prevention and treatment. Interventions that strengthen adaptive regulatory strategies, such as cognitive reappraisal, mindfulness, and acceptance, may hold value for reducing cannabis use, though empirical testing in this population remains limited. Future longitudinal and experimental studies are needed to clarify causal directions, trends in gender-specific results, delineate recovery trajectories following abstinence, and identify moderators such as age of onset, and psychiatric comorbidity. Clarifying how emotion regulation both shapes and is shaped by cannabis use during adolescence and early adulthood will be essential for developing evidence-based prevention and early intervention strategies.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found here: included article (Stone 2024), provided access to the available data. All data, syntax, and materials are freely available on the Open Science Framework website: https://doi.org/10.17605/OSF.IO/WKT9Y.

Author contributions

RF: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing, Software. SR: Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. FO: Formal analysis, Methodology, Software, Writing – original draft, Visualization. AA: Investigation, Methodology, Writing – original draft. ND: Supervision, Visualization, Writing – review & editing. LS: Supervision, Writing – review & editing. CH: Funding acquisition, Methodology, Supervision, Visualization, Writing – review & editing. DG: Supervision, Writing – review & editing. BS: Methodology, Supervision, Writing – review & editing. MC: Funding acquisition, Investigation, Supervision, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fradm.2026.1766637/full#supplementary-material

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