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Maladaptive Daydreaming and Psychopathology: A Meta-Analysis

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ABSTRACT

Maladaptive daydreaming (MD) is a clinical condition that cannot be explained by any existing psychopathology. The empirical literature regarding MD suggests that it is associated with mental afflictions and exhibits attributes resembling a psychological disorder. This study aimed to meta-analytically investigate the relationship between MD and various manifestations of mental distress and dysfunction. Forty studies, totaling 24,977 individuals ($Mean_{(age)} = 28.75$, $SD = 9.90$), met our eligibility inclusion criteria and were incorporated in the analyses. Findings revealed that MD is positively associated with depression, anxiety, dissociation, obsessive-compulsive disorder, attention deficit/hyperactivity disorder, general psychopathology, psychotic symptoms, autism spectrum disorder and traumatic experiences. Some effects were moderated by sample type, age and gender. Our secondary analyses examined other psychological problems. We found a positive association between MD and difficulties in emotion regulation, loneliness, dysfunctional personality traits, negative affect, pathological celebrity worship, personality disorder, shame, somatic symptoms, problematic internet use and psychological distress. Additionally, there was a negative association between MD and self-efficacy and self-esteem. Our findings suggest that MD behaves like other DSM disorders by showing comorbidity with various psychopathologies. Theoretical and clinical implications of these findings are discussed.

1 | Introduction

> . . . daydreaming was my go-to place when my parents were screaming at each other. My first-grade teachers noticed that I was less attentive than most children, and they were right. I preferred my imaginary world to class. I was diagnosed with attention deficit hyperactivity disorder and never cared much about school. I was too troubled by my fears and sadness. In my fantasies, I am successful and surrounded by a loving family. But in reality, I am lonely, socially anxious, avoidant, and angry. I don't have the energy to change anything. No one deserves a life like that. If I can't change it, I might as well end it.
>
> (31-year-old male)

Maladaptive daydreaming (MD) is a clinical condition that cannot be better explained by any existing nosology in the

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Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5-TR; American Psychiatric Association 2022) or the International Classification of Diseases, 11th Revision (ICD-11; World Health Organization 2019). It involves an elaborate compulsive immersion in intense fanciful fantasy characterised by intricate set-ups, frequently supplemented by exposure to evocative music and repetitive movements such as pacing, gesturing and mouthing. This immersive form of daydreaming is often a highly gratifying behaviour that can become a time-consuming addiction when people engage in it at the expense of meeting their academic, social or professional obligations (Pietkiewicz et al. 2018; Schimmenti et al. 2019; Somer 2002).

In a previous study employing Critical Discourse Analysis, Bershtling and Somer (2018) analysed messages sent by individuals identifying as struggling with MD. The study explored the verbal strategies these individuals used to convey the authenticity of their distress and to advocate for greater awareness and recognition of MD as a mental health concern. The desperate efforts by the MD community to medicalize their condition are rooted in their difficulties in obtaining an accurate diagnosis and specific treatment for their condition. The authors reported that "the unfamiliarity of professionals with MD steered them towards more familiar diagnoses and interventions" (p. 475). However, none of the interviewees seeking help for their MD were offered any effective treatment. Similar complaints can be read on numerous Facebook and Internet forums dedicated to peer support for MD (e.g., Maladaptive Daydreaming, a Facebook group with about 5500 members. Retrieved on 19 February 2024). The unawareness of MD amongst academics and clinicians is exacerbated by professional scepticism. Some argue that MD represents an overexpansion of mental health diagnoses. Raskin (2022) describes it as an example of "the 'DSM-ing' of everyday life, in which any upsetting or problematic experience is readily assimilated into the lexicon of mental disorder." In contrast, others highlight evidence of significant impairment amongst individuals with MD. Soffer-Dudek (2022) notes, "…our studies have shown that maladaptive daydreamers (MDers) are suffering immensely. In one study, almost half the sample was unemployed, and over a quarter had attempted suicide at least once… In another study, most of the sample met the criteria for 3–4 different DSM diagnoses." These contrasting perspectives underscore the debate over MD's clinical significance.

In the face of the insufficient help available, individuals with MD seem to form online peer-support groups. Although not yet listed in any of the major diagnostic manuals, it is estimated that hundreds of thousands of individuals across the globe seek peer support and advice in Internet forums dedicated to this condition. For example, a "Reddit" MD community has over 121,000 members (retrieved on 21 November 2024, from www.reddit.com/r/MaladaptiveDreaming/). The term "maladaptive daydreaming," a relatively new designation, was coined about two decades ago (Somer 2002) and, according to Google Trends, yielded no results on search engines before that. However, a current Google search for the phrase "maladaptive daydreaming" produced over a million results (retrieved 21 November 2024). Suffering individuals worldwide turn to the Internet for information about their misery.

The disparity between patients' needs for professional recognition of MD as a mental disorder and the combination of unawareness and scepticism in the clinical community calls for a research effort to weigh in.

1.1 | Mental Health Correlates of MD

Earlier research suggested a positive correlation between daydreaming and both creativity and achievement motivation (Singer and Schonbar 1961). Jerome Singer's later review of his pioneering work on daydreaming further showed how daydreaming and fantasy can enhance everyday problem-solving and creativity (Singer 2009). Moreover, Zedelius et al. (2021) found that fantastical daydreaming predicted creative writing quality and daily creative behaviour, while personally meaningful daydreaming predicted self-reported creative behaviour. In other words, because daydreaming has been shown to enhance creativity, problem-solving, achievement motivation and imaginative thought, it may seem counterintuitive that this mental activity could also have a psychopathological variant. Contrarily, research in the past two decades has presented considerable evidence showing MD is associated with indices of mental distress and behavioural dysfunction. For example, MD is highly correlated with difficulties in emotion regulation (e.g., Thomson and Jaque 2023a; West and Somer 2020), shame (e.g., Ferrante et al. 2022), elevated dissociation (e.g., Schimmenti et al. 2019; Soffer-Dudek and Somer 2022), ADHD (e.g., Catelan et al. 2023; Jopp et al. 2019), depression (e.g., Shafiq and Zafar 2022; Moment 2023) and anxiety (e.g., Horváth-Labancz et al. 2022; Zsila et al. 2019).

1.2 | The Current Study

The empirical literature regarding MD suggests that it may not constitute a typical expression of daydreaming. Instead, MD seems an aberrant manifestation of fantasising associated with other mental afflictions, intimating it is qualitatively disparate from normal fantasising and exhibits attributes resembling a psychological disorder. Nevertheless, the current body of research is deficient in systematic organisation and synthesis of the existing empirical evidence, thus precluding definitive conclusions that elucidate cogent theoretical and clinical ramifications.

This study aimed to systematically investigate the relationship of MD and various manifestations of mental distress and dysfunction across studies using meta-analytic techniques. Specifically, we aimed to test if MD behaves like most other DSM disorders by showing comorbidity or a relationship with other mental health problems (Kessler et al. 2005). The scientific relevance of understanding the link between MD and psychopathology is that if MD is found to be linked with psychopathology, it would help resolve the doubts about its standing as a mental disorder. The clinical relevance of such a connection is that it may be important to identify MD as a transdiagnostic condition that should be identified and targeted in psychotherapy. A meta-analysis of the existing literature may provide a better understanding of the association between MD and psychopathology across disorders and symptoms, as it will provide bias-corrected estimates of the size and pattern of effects that cannot be gained from a narrative literature review.

To address the existing gaps in the current literature, we conducted a systematic review and meta-analysis to determine whether the MD–psychopathology relationship is statistically significant across diverse disorders and studies.

2 | Method

This meta-analysis followed PRISMA guidelines (Page et al. 2021).

2.1 | Information Sources and Database Search

We conducted a literature search on MD and psychopathology from January 2002, when the term was coined by Somer (2002), to March 2024. Using the keyword "Maladaptive daydreaming" in the title, we searched PubMed (72 results), APA PsycNet (70 results) and Google Scholar (167 results). Studies were selected based on inclusion criteria examining the link between MD and significant psychopathology. Despite growing research over the past two decades, empirical research on this relatively new area of psychological study remains in its infancy. Second, the methodology had to be quantitative. The study primarily investigates the relationship between MD and major psychopathologies. Secondary analyses include MD's relationship with other psychological issues, such as personality disorders. Inclusion criteria require sufficient statistical information for effect size calculation and publication in English. Qualitative or descriptive studies were excluded.

Applying these criteria resulted in the 40 eligible studies for the current analysis. Figure 1 presents a full reporting diagram flow based on the PRISMA guidelines. The final set of 40 studies comprises those for which we could calculate the effect size of the relationship between MD and each of the following significant psychopathologies: Depression ($n = 14$), Anxiety ($n = 11$), Dissociation ($n = 10$), Obsessive Compulsive Disorder (OCD; $n = 8$), Attention Deficit Hyperactivity Disorder (ADHD; $n = 7$), General Psychopathology ($n = 6$), Psychotic Symptoms ($n = 6$), Autism Spectrum Disorder (ASD; $n = 2$) and Traumatic Experiences ($n = 8$). Those studies reported 24,977 individuals, 18,519 female and 5905 male participants, with a mean age of 28.75 (SD = 9.90).

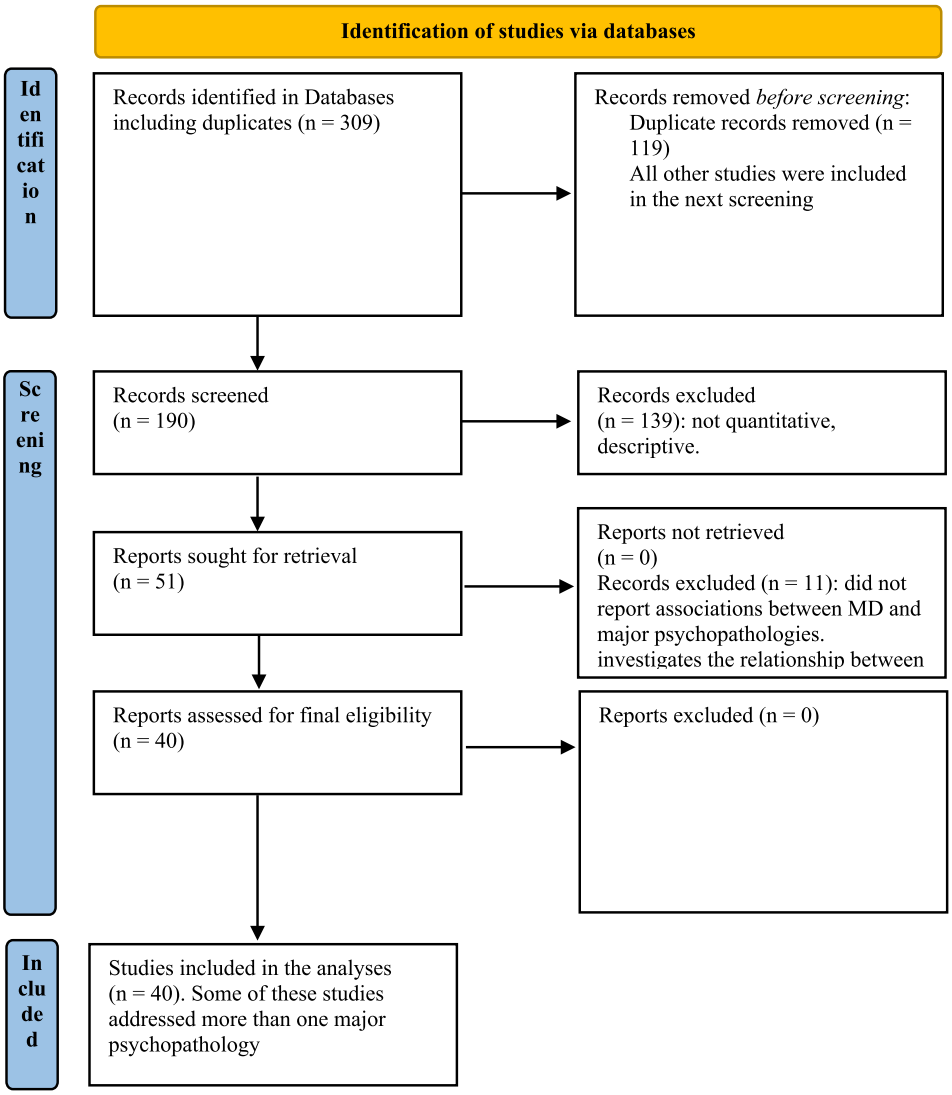

FIGURE 1 | Maladaptive daydreaming and psychopathology: PRISMA flow diagram.

Table S1, in the Supporting Information, describes the measured psychopathology used in those studies. Some of these studies also provided data on the relationship between MD and psychological problems, which we have meta-analysed.

2.2 | Coding of Study Characteristics and Moderators

There were two independent coders who categorised variables as relevant, and any disparities were discussed and duly revised. The included studies comprised three key variables for moderation analyses: participants' mean age, type of sample (e.g., community, clinical, mix of MD and community, mix of MD and clinical) and the proportion of male and female participants in the samples. A comprehensive Meta-Analysis Version 2 (CMA Ver. 2.0) (Borenstein et al. 2011) was used to perform the analysis. We did not include in the moderation analysis three studies whose authors were uncontactable or who did not reply within 2 weeks to the initial email requiring some further information about the moderator.

2.3 | Statistical Analysis

2.3.1 | Summary Measures

The extracted data were coded in two different formats (correlations or means and standard deviations). The adopted effect size format for the pooled effect size of each meta-analysis (per psychopathology and the combination of all psychopathologies: overall psychopathology) was 'correlation' with 95% confidence intervals for each study, which was evaluated against the overall weighted effect size. We employed a random effects model which considers both within- and between-study variability, offering greater generalisability than the fixed effects model. Each study's weight (the inverse of variance) is reported, indicating its precision (Borenstein et al. 2011).

2.3.2 | Heterogeneity and Moderators Analysis

Significant heterogeneity (Qb) suggests that variations in effect sizes are due to specific factors and moderators rather than sampling errors. I^2 measures variability across studies (Borenstein et al. 2011), with values above 75% indicating variance due to moderators and below 25% due to random error (Huedo-Medina et al. 2006). We conducted moderator analyses using ANOVAs for the categorical variable "type of sample" and meta-regressions for continuous moderators (participants' age and the proportions of female and male participants in the samples).

2.3.3 | Publication Bias

Publication bias occurs when studies with large effects are more likely to be published, potentially overestimating the actual effect. To assess this and ensure accurate conclusions, we employed four distinct methods, each providing a different indication:

1. Rosenthal's Failsafe Number (Rosenthal 1995): Indicates the number of unpublished studies needed to nullify significant results. Results are considered unbiased if Failsafe N exceeds 10 (5k + 10), where k is the number of studies.
2. Begg and Mazumbar Rank Correlation Test (Begg and Mazumdar 1994): Examines the relationship between effect size and variance. No bias is indicated by a non-significant relationship (Kendall's tau b near zero; Rothstein et al. 2005).
3. Egger's test (Egger et al. 1997): Uses linear regression to assess bias in the funnel plot. Greater deviation from zero indicates larger systematic differences between studies of different sizes.
4. Duval and Tweedie's Trim and Fill Test (Duval and Tweedie 2000): Imputes missing studies to create a symmetric funnel plot and adjusts the effect size. The deviation between the original and adjusted effect sizes indicates the severity of publication bias.

One study removal analysis checks if removing any single study affects the pooled effect size's significance level, further validating the meta-analysis results.

3 | Results

Our analysis begins with a meta-analysis examining the relationship between MD and major psychopathologies, followed by an exploration of MD's association with minor psychological problems. We calculate pooled effect size correlations across studies for each psychopathology, major and minor. For major psychopathologies, we then conduct moderation analyses; however, these analyses are not performed for minor psychological problems due to an insufficient number of studies. We assess publication bias for the major psychopathologies. Analyses for minor psychological issues are reported in Table S2.

3.1 | MD and Major Psychopathologies

As displayed in Figures 2–10, the combined effect size showed a positive correlation between MD and depression ($k = 14$; $r = 0.432$, 95% CI (0.084, 0.686), $p = 0.017$), anxiety ($k = 11$; $r = 0.387$, 95% CI (0.251, 0.508), $p = 0.000$), dissociation ($k = 10$; $r = 0.447$, 95% CI (0.372, 0.516), $p = 0.000$), OCD ($k = 8$; $r = 0.303$, 95% CI (0.243, 0.361), $p = 0.000$), ADHD ($k = 7$; $r = 0.312$, 95% CI (0.213, 0.405), $p = 0.000$), general psychopathology ($k = 6$; $r = 0.539$, 95% CI (0.403, 0.652), $p = 0.000$), psychotic symptoms ($k = 6$; $r = 0.297$, 95% CI (0.159, 0.423), $p = 0.000$), ASD ($k = 2$; $r = 0.162$, 95% CI (0.110, 0.213), $p = 0.000$) and traumatic experiences ($k = 8$; $r = 0.198$, 95% CI (0.131, 0.263), $p = 0.000$).

The heterogeneity assessments were significant for all analyses except ASD (depression: $Q(13) = 4607.54$, $p = 0.000$; $I^2 = 99.72\%$; anxiety: $Q(10) = 347.83$, $p = 0.000$; $I^2 = 97.13\%$; dissociation: $Q(9) = 68.11$, $p = 0.000$; $I^2 = 86.79\%$; OCD: $Q(7) = 22.56$, $p = 0.002$; $I^2 = 68.97\%$; ADHD: $Q(6) = 75.51$, $p = 0.000$; $I^2 = 92.05\%$; general psychopathology: $Q(5) = 107.88$, $p = 0.000$; $I^2 = 95.37\%$; psychotic symptoms: $Q(5) = 76.31$, $p = 0.000$; $I^2 = 93.45\%$; ASD: $Q(1) = 0.14$,

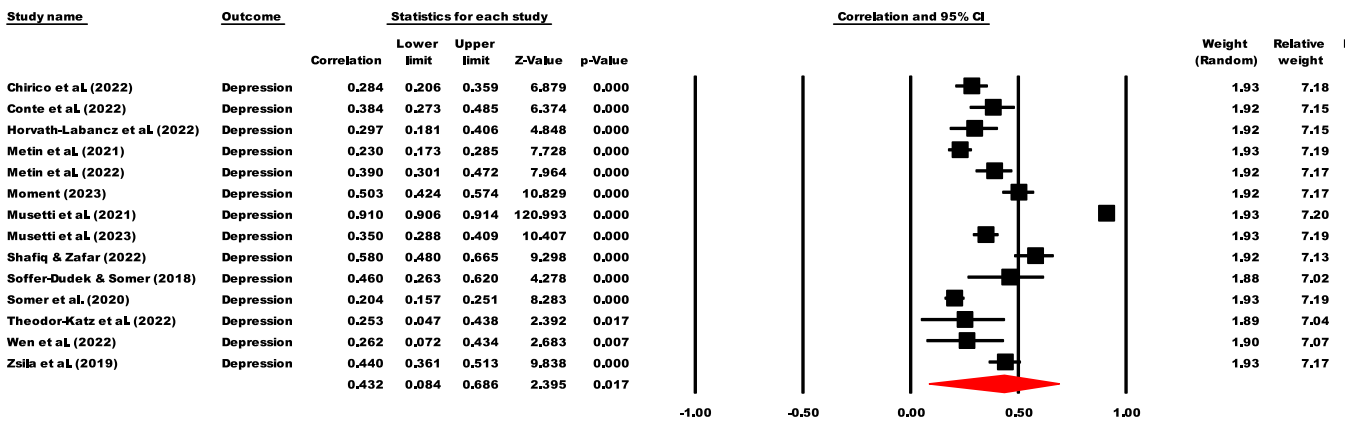

FIGURE 2 | Forest plot for the relationship between MD and depression.

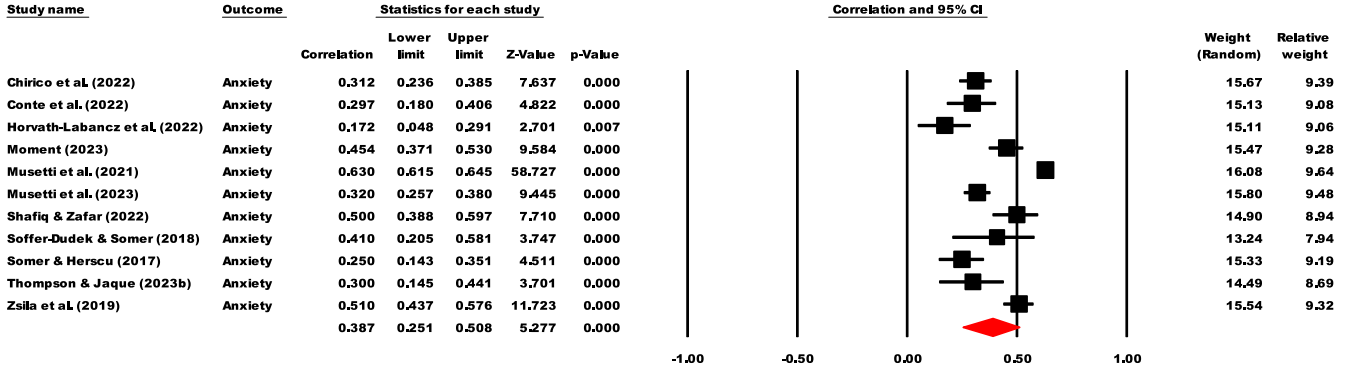

FIGURE 3 | Forest plot for the relationship between MD and anxiety.

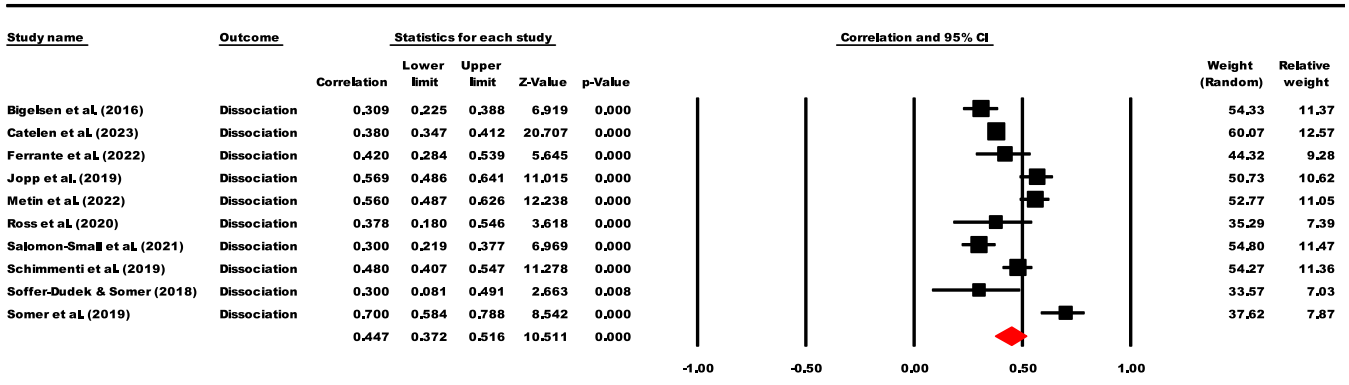

FIGURE 4 | Forest plot for the relationship between MD and dissociation.

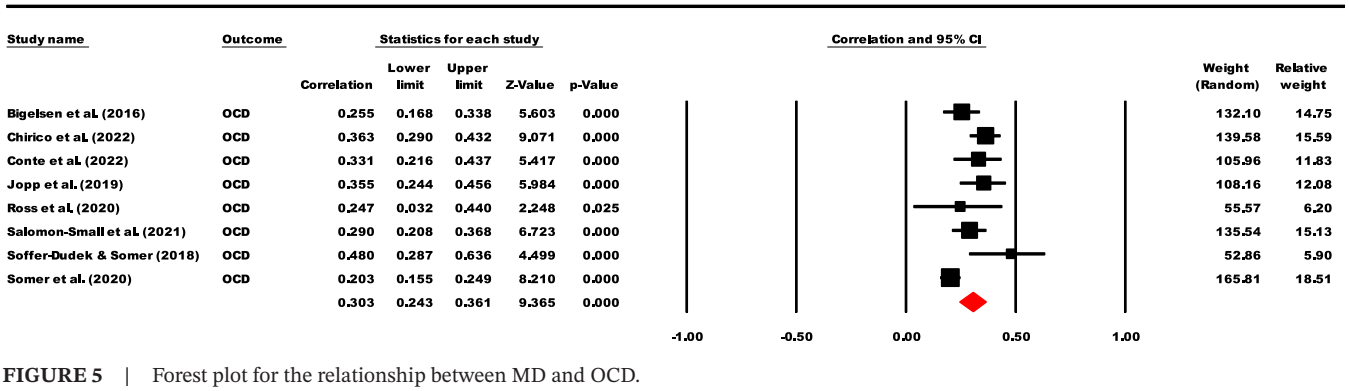

FIGURE 5 | Forest plot for the relationship between MD and OCD.

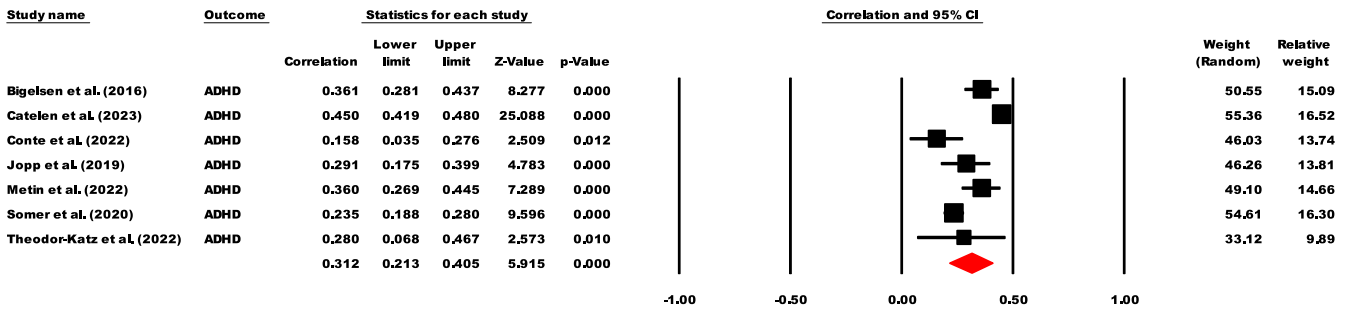

FIGURE 6 | Forest plot for the relationship between MD and ADHD.

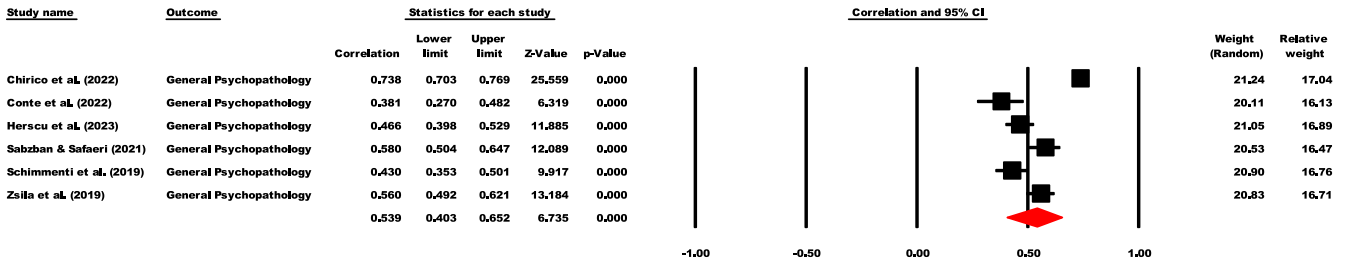

FIGURE 7 | Forest plot for the relationship between MD and general psychopathology.

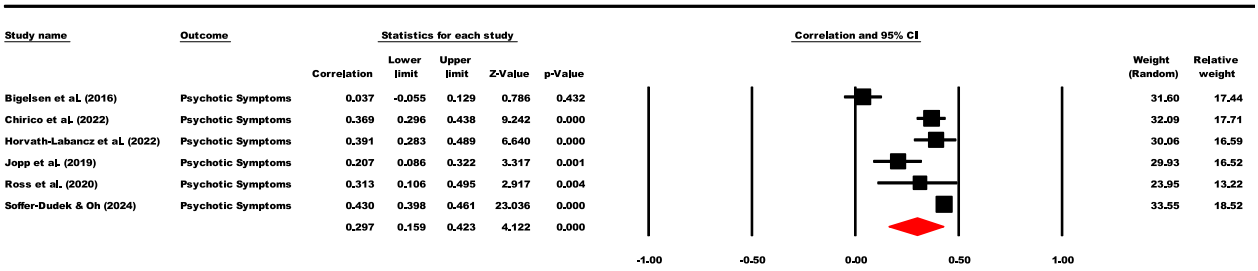

FIGURE 8 | Forest plot for the relationship between MD and psychotic symptoms.

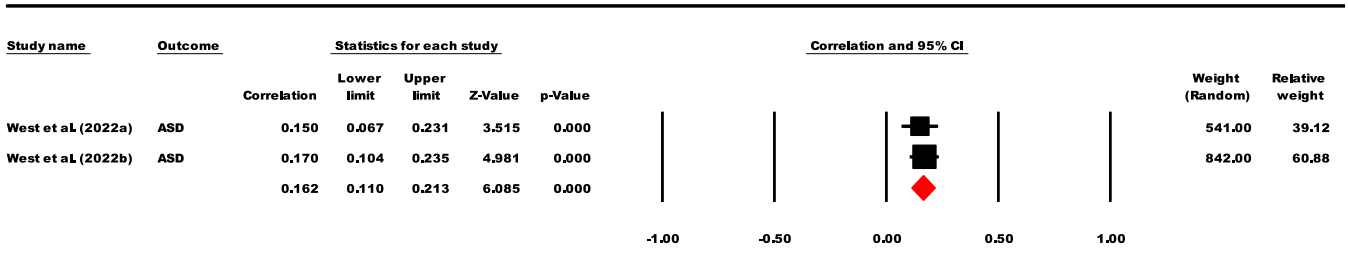

FIGURE 9 | Forest plot for the relationship between MD and ASD.

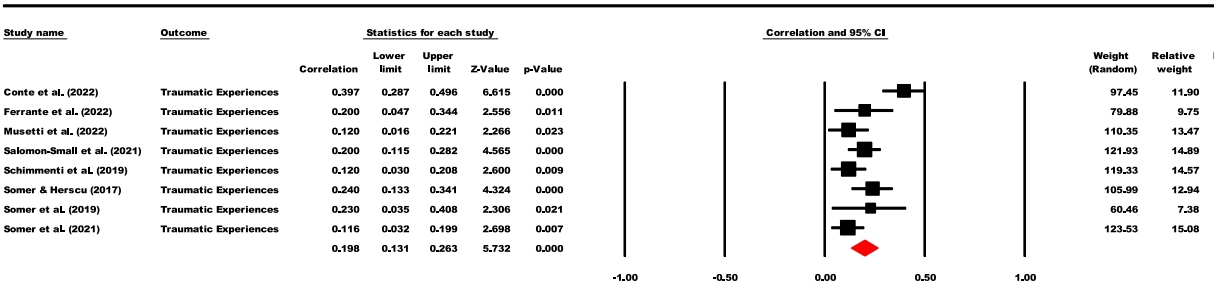

FIGURE 10 | Forest plot for the relationship between MD and traumatic experiences.

$p = 0.710$; $I^2 = 0.000\%$; and traumatic experiences: $Q(7) = 21.17$, $p = 0.004$; $I^2 = 66.93\%$).

The pooled effect size for the overall major psychopathology was significant ($k = 72$; $r = 0.372$, 95% CI (0.282, 0.454), $p = 0.000$) with a significant heterogeneity between groups ($Q(71) = 8372.39$, $p = 0.000$; $I^2 = 99.15\%$).

3.2 | MD and Minor Psychological Problems

As shown in Figures S1–S13 in the Supporting Information, the combined effect size indicated a positive association between MD and difficulties in emotion regulation ($k = 4$; $r = 0.365$, 95% CI (0.308, 0.419), $p = 0.000$), loneliness ($k = 3$; $r = 0.292$, 95% CI (0.218, 0.363), $p = 0.000$), dysfunctional personality traits ($k = 2$; $r = 0.280$, 95% CI (0.043, 0.488), $p = 0.021$), negative affect ($k = 3$; $r = 0.362$, 95% CI (0.223, 0.488), $p = 0.000$), pathological celebrity worship ($k = 4$; $r = 0.404$, 95% CI (0.365, 0.442), $p = 0.000$), personality disorder ($k = 1$; $r = 0.230$, 95% CI (0.014, 0.426), $p = 0.037$), shame ($k = 2$; $r = 0.451$, 95% CI (0.379, 0.517), $p = 0.000$), somatic symptoms ($k = 2$; $r = 0.210$, 95% CI (0.011, 0.392), $p = 0.039$), problematic internet use ($k = 2$; $r = 0.404$, 95% CI (0.302, 0.497), p = 0.000), psychological distress ($k = 4$; $r = 0.492$, 95% CI (0.468, 0.515), $p = 0.000$) and a negative association with self-efficacy ($k = 2$; $r = -0.156$, 95% CI (-0.225, -0.085), p = 0.000) and self-esteem ($k = 1$; $r = -0.360$, 95% CI (-0.534, -0.156), $p = 0.001$). The association between MD and positive affect was not significant ($k = 2$; $r = -0.040$, 95% CI (-0.476, 0.412), $p = 0.870$).

The heterogeneity assessments were significant for loneliness ($Q(2) = 6.062$, $p = 0.048$; $I^2 = 67\%$), dysfunctional personality traits ($Q(1) = 12.60$, $p = 0.000$; $I^2 = 92.07\%$) and positive affect ($Q(1) = 10.14$, $p = 0.001$; $I^2 = 90.14\%$) only.

The heterogeneity assessments for the rest of the factors were not significant (difficulties in emotion regulation: $Q(3) = 5.23$, $p = 0.156$; $I^2 = 42.65\%$; negative affect: $Q(2) = 4.05$, $p = 0.132$; $I^2 = 50.64\%$; problematic celebrity worship: $Q(3) = 3.45$, $p = 0.328$; $I^2 = 12.98\%$; personality disorder: $Q(0) = 0$, $p = 1$; $I^2 = 0\%$; self-esteem: $Q(0) = 0$, $p = 1$; $I^2 = 0\%$; shame: $Q(1) = 0.154$, $p = 0.695$; $I^2 = 0\%$, somatic symptoms: $Q(1) = 2.534$, $p = 0.111$; $I^2 = 60.54\%$; problematic internet use: $Q(1) = 2.586$, $p = 0.108$; $I^2 = 61.34\%$; psychological distress: $Q(3) = 2.920$, $p = 0.404$; $I^2 = 0\%$; and self-efficacy: $Q(1) = 0.019$, $p = 0.890$; $I^2 = 0\%$).

The pooled effect size for the overall minor psychological problems was significant ($k = 32$; $r = 0.384$, 95% CI (0.366, 0.401), $p = 0.000$) with a significant heterogeneity between groups ($Q(31) = 481.03$, $p = 0.000$; $I^2 = 93.56\%$).

3.3 | Moderation Analysis

In some analyses, I^2 variance exceeded 75%, suggesting that the differences in the MD-psychopathology relationship across studies were likely due to moderators rather than random error. To investigate these potential moderators, we conducted meta-ANOVAs for sample type (community, MD community, clinical, mix of MD community, and mix of MD and clinical) and meta regressions for age and gender proportions as continuous moderators.

3.3.1 | Sample Type as a Moderator

The heterogeneity analysis was significant for some of the analyses but not for others. The heterogeneity assessment indicated that the relationship between MD and *anxiety* was significantly moderated by sample type (Qb = 7.82, $p = 0.020$). The moderation analysis shows that the relationship between MD and anxiety is stronger in general community samples ($k = 9$, $r = 0.407$, $p = 0.000$) and amongst MD community samples ($k = 1$, $r = 0.410$, $p = 0.000$) and weaker in clinical samples ($k = 1$, $r = 0.172$, $p = 0.007$).

Furthermore, moderation was significant in the relationship between MD and *dissociation* (Qb = 9.25, $p = 0.026$). The relationship between MD and dissociation tends to be stronger in clinical samples ($k = 2$, $r = 0.561$, $p = 0.007$), mixed samples of MD and the general community ($k = 1$, $r = 0.480$, $p = 0.000$), general community samples ($k = 4$, $r = 0.458$, $p = 0.000$) and MD community samples ($k = 3$, $r = 0.332$, $p = 0.000$).

The relationship between MD and *OCD* was also significantly moderated by sample type (Qb = 12.54, $p = 0.006$), with this association being stronger in MD community samples ($k = 2$, $r = 0.367$, $p = 0.000$) and community samples ($k = 4$, $r = 0.325$, $p = 0.000$) and less so in clinical samples ($k = 1$, $r = 0.247$, $p = 0.025$) or mixed MD and community samples ($k = 1$, $r = 0.203$, $p = 0.000$).

The association between MD and *ADHD, depression, general psychopathology, ASD, psychotic symptoms and traumatic experiences* was not moderated by sample type.

Finally, the relationship between MD and overall *psychopathology* was also significantly moderated by sample type (Qb = 16.96, $p = 0.002$), with this being stronger in community samples ($k = 42$, $r = 0.412$, $p = 0.000$), MD community samples ($k = 13$, $r = 0.304$, $p = 0.002$) and clinical samples ($k = 10$, $r = 0.336$, $p = 0.000$) and less so in mixed MD and general community ($k = 6$, $r = 0.281$, $p = 0.000$) or mixed MD and clinical ($k = 1$, $r = 0.170$, $p = 0.000$) samples.

3.3.2 | Participants' Age as a Moderator

The heterogeneity assessment indicated that the relationship between MD and *anxiety* was significantly positively moderated by age ($Q = 63.25$, $p = 0.000$; B slope = 0.016, 95% CI: 0.01; 0.02, $p = 0.000$); the higher the age, the stronger the association (excluding Moment 2023 due to missing data on age). The same pattern was also found for *depression* ($Q = 1104$, $p = 0.000$; B slope = 0.065, 95% CI: 0.06; 0.07, $p = 0.000$) (excluding Moment 2023 due to missing data on age) and *psychotic symptoms* ($Q = 19.96$, $p = 0.000$; B slope = 0.011, 95% CI: 0.006; 0,016, $p = 0.000$).

On the other hand, the heterogeneity assessment indicated that the relationship between MD and *OCD* was significantly

negative ($Q = 5.4$, $p = 0.019$; B slope = −0.008, 95% CI: 0.02; −0,001, $p = 0.019$), meaning the lower the age, the stronger the association (excluding Sabzban and Safaei 2021 due to missing data on age). We found the same pattern for *traumatic experiences* ($Q = 5.43$, $p = 0.019$; B slope = −0.008, 95% CI: −0.02; −0,001, $p = 0.019$).

The findings of the moderation analysis for age for the relationship between MD and each of *ADHD, dissociation and general psychopathology* were non-significant. We could not perform the analysis for *ASD* as there were only two studies.

Finally, the heterogeneity assessment indicated that the relationship between MD and *overall psychopathology* was significantly positively moderated by age ($Q = 801.96$, $p = 0.000$; B slope = 0.024, 95% CI: 0.022; 0,026, $p = 0.000$); the higher the age, the stronger the association (excluding Moment 2023 and Sabzban and Safaei 2021 due to missing data on age).

3.3.3 | Gender as a Moderator

MD and psychopathologies were not reported in the studies separately for each gender. To fully use the data and analyses, we used the proportion of female and male participants as a moderator in our meta-analysis. The heterogeneity assessment indicated that the relationship between MD and *ADHD* was positively moderated by the female percentage in the sample ($Q = 50.56$, $p = 0.000$; B slope = 0.032, 95% CI: 0.023; 0.04, $p = 0.000$); the higher the proportion of females, the stronger the association. Conversely, the association of MD and ADHD was negatively moderated by the percentage of males in the sample ($Q = 50.39$, $p = 0.000$; B slope = −0.032, 95% CI: −0.046; −0.023, $p = 0.000$). The same pattern was also found for *anxiety* (Females: $Q = 16$, $p = 0.000$; B slope = 0.003, 95% CI: 0.002; 0.005, $p = 0.000$; Males: $Q = 16.01$, $p = 0.000$; B slope = −0.003, 95% CI: −0.005; −0.002, $p = 0.000$) (excluding Thomson and Jaque 2023b due to missing data on age), and *depression* (Females: $Q = 13.79$, $p = 0.000$; B slope = 0.003, 95% CI: 0.001; 0.005, $p = 0.000$; Males: $Q = 13.76$, $p = 0.000$; B slope = −0.003, 95% CI: −0.005; −0.001, $p = 0.000$).

On the other hand, the heterogeneity assessment indicated that the relationship between MD and *OCD* was positively moderated by the percentage of males ($Q = 4.29$, $p = 0.038$; B slope = 0.005, 95% CI: 0.0003; 0.01, $p = 0.038$); the higher the percentage of males, the stronger the association. In contrast, the female percentage negatively moderated the association ($Q = 4.33$, $p = 0.037$; B slope = −0.005, 95% CI: −0.01; −0.0003, $p = 0.037$). A similar pattern was also found for *dissociation* (Females: $Q = 24.37$, $p = 0.000$; B slope = −0.005, 95% CI: −0.008; −0.003, $p = 0.000$; Males: $Q = 24.29$, $p = 0.000$; B slope = 0.005, 95% CI: 0.003; 0.008, $p = 0.000$).

The moderation analysis on gender did not return any significant results for the relationship between MD and *general psychopathology, traumatic experiences* or *psychotic symptoms*. We could not perform the analysis for *ASD* as there were only two studies.

Finally, the heterogeneity assessment indicated that the relationship between MD and *overall psychopathology* was positively moderated by the percentage of males ($Q = 86.37$, $p = 0.000$; B slope = 0.004, 95% CI: 0.003; 0.004, $p = 0.000$), and negatively moderated by the percentage of females in the samples ($Q = 86.23$, $p = 0.000$; B slope = −0.004, 95% CI: −0.004; −0.003, $p = 0.000$) (excluding Thomson and Jaque 2023b due to missing data on gender).

3.4 | Publication Bias: Major Psychopathologies

We report the results of four publication bias methods to assess publication bias for the major psychopathologies in Table 1.

The '5k + 10' benchmark using Rosenthal's Failsafe N analysis was reached for the major psychopathology factors, indicating no publication bias. The Kendall's tau calculations indicated an absence of publication bias except for depression, traumatic experiences and overall psychopathology. The Egger's Test showed publication bias for anxiety, depression, OCD and overall psychopathology. Lastly, the Trim-and-Fill analysis suggests the potential presence of five missing studies for depression, one for dissociation, general psychopathology, OCD and psychotic symptoms, and 19 for overall psychopathology. However, with the supposition that these studies are imputed and include in the analysis, the mean effect shifts only slightly to the right or left (from 0.432 to 0.522 for depression, from 0.447 to 0.457 for dissociation, from 0.539 to 0.566 for general psychopathology, from 0.303 to 0.291 for OCD, from 0.297 to 0.265 for psychotic symptoms, and from 0.372 to 0.433 for overall psychopathology).

For minor psychological problems, the '5k + 10' benchmark using Rosenthal's Failsafe N analysis was reached for all, indicating no publication bias. The Kendall's tau calculations and the regression Egger's Test indicated an absence of publication bias. Lastly, the Trim-and-Fill analysis showed the same effect sizes, except for difficulties in emotion regulation (2 studies missing to the left of the mean), negative affect (2 studies missing to the left of the mean) and overall minor psychopathology (7 studies missing to the left of the mean). However, with the supposition that these studies are imputed and include in the analysis, the mean effect shifts only slightly to the right or left (Supporting Information, Table S2).

Overall, while it is likely that some studies are missing from the analysis due to publication bias, as this is typically the case in meta-analyses, the impact of missing studies in this analysis was probably minor.

3.4.1 | One Study Removed Analyses

Lastly, to validate the results of our meta-analyses further for the relationship between MD and major psychopathologies, we repeated the meta-analyses for the major psychopathologies and overall psychopathology by removing each study individually. The results show that when a study was removed, the pooled effect sizes for the relationship between MD and each major psychopathology and the overall psychopathology remained stable and statistically significant (see Supporting Information, Figures S14–S22).

TABLE 1 | Publication bias analysis using four methods for the relationship between MD and major psychopathologies.

	Publication bias methods				
Psychopathology factors	**Fail safe Na**	**'5k + 10' benchmark**	**Begg and Mazumdar (Kendall's tau)**	**Egger's regression test (95% CI)**	**Trim-and-fill (95% CI) (trimmed studies)**
ADHD	934	45	−0.286 $p = 0.183$	$\beta = -2.88$ (−9.73, 3.96) $p = 0.164$	0.312 (0.21, 0.40)
Anxiety	4012	65	0.11 $p = 0.320$	$\beta = -7.44$ (−11.29, −3.59) $p = 0.000$	0.387 (0.25, 0.51)
Depression	11,774	80	0.55 $p = 0.003$	$\beta = -20.69$ (−34.99, −638) $p = 0.004$	0.522 (0.29, 0.69)
Dissociation	2080	60	0.222 $p = 0.185$	$\beta = 0.19$ (−1.81, 5.66) $p = 0.134$	0.457 (0.38, 0.52)
General psychopathology	1617	40	−0.133 $p = 0.353$	$\beta = -16.26$ (−43.07, 10.56) $p = 0.084$	0.566 (0.45, 0.60)
OCD	568	50	0.179 $p = 0.268$	$\beta = 2.68$ (−0.14, 5.49) $p = 0.029$	0.291 (0.23, 0.35)
Psychotic symptoms	544	40	−0.267 $p = 0.226$	$\beta = -4.09$ (−12.18, 4.00) $p = 0.116$	0.265 (0.11, 0.41)
Traumatic experiences	196	50	0.464 $p = 0.054$	$\beta = 3.049$ (−2.85, 8.95) $p = 0.126$	0.198 (0.13–0.26)
ASD[a]	NA	NA	NA	NA	NA
Overall psychopathology	5988	370	0.302 $p = 0.000$	$\beta = -9.696$ (−13.97, −5.42) $p = 0.000$	0.433 (0.365–0.497)

[a]Included only two studies and thus cannot be performed.

4 | Discussion

The meta-analysis sought to systematically investigate the relationship between MD and various manifestations of mental distress and dysfunction. Our findings, derived from 40 studies encompassing a total of 24,977 individuals, revealed that MD is positively associated with a range of psychopathology indices, including depression, anxiety, dissociation, OCD, ADHD, general psychopathology, psychotic symptoms, ASD, traumatic experiences and overall psychopathology (the combination of all psychopathologies). Additionally, MD shows significant associations with difficulties in emotion regulation, loneliness, dysfunctional personality traits, negative affect, pathological celebrity worship, personality disorders, shame, somatic symptoms, problematic internet use and psychological distress. Conversely, we found that MD had a negative association with self-efficacy and self-esteem. These results suggest that MD behaves similarly to other DSM disorders by exhibiting comorbidity with various mental health issues.

The findings align with previous research indicating that MD is not merely a benign form of daydreaming but is often associated with significant mental health challenges (e.g., Thomson and Jaque 2023a; Soffer-Dudek and Somer 2022; Catelan et al. 2023; Moment 2023; Horváth-Labancz et al. 2022).

The findings from this comprehensive meta-analysis offer compelling evidence for considering MD as a distinct mental disorder worthy of classification in major psychiatric diagnostic manuals like the DSM and ICD. The observed comorbidity patterns between MD and a wide range of established psychopathologies mirror those seen in other recognised mental disorders, suggesting similar underlying neurobiological or psychological mechanisms. These associations, coupled with MD's links to difficulties in emotion regulation, dysfunctional personality traits and psychological distress, align closely with general criteria for mental disorders. The negative associations with self-efficacy and self-esteem, along with positive correlations with loneliness and shame, indicate that MD likely causes significant functional impairment and distress—key criteria for diagnosing mental disorders. While MD shows relationships with various psychopathologies, its unique symptomatology distinguishes it as a potentially distinct condition rather than merely a symptom of other disorders.

Maladaptive daydreaming represents a discrete psychological condition with identifiable, consistent phenomenological markers that distinguish it from mere symptomatic manifestations of other disorders (Somer et al. 2017; Soffer-Dudek and Somer 2018). Unlike transient daydreaming or disorder-specific dissociative experiences, MD demonstrates a specific cluster of characteristics: (1) immersive, time-consuming fantasy states that significantly disrupt daily functioning, (2) a compulsive quality to the daydreaming that resists voluntary control, (3) heightened emotional intensity within these fantasy experiences and (4) measurable neuropsychological differences in emotional and attentional regulation (e.g., Theodor-Katz et al. 2022). Empirical evidence suggests MD is not simply a byproduct of other psychiatric conditions but a potentially independent construct, supported by (a) a consistent phenomenological presentation across diverse clinical populations (e.g., Soffer-Dudek et al. 2020); (b) significant impairment in social, occupational and personal functioning (e.g., Bigelsen et al. 2016); and (c) distinct therapeutic interventions tailored specifically to MD, which differ from treatments for comorbid disorders (Herscu et al. 2023).

New findings from our meta-analysis have emerged in relation to previous research. These findings indicate that the associations between MD and certain psychopathologies are moderated by

sample type (community, clinical, MD and community or, MD and clinical), age and gender.

For instance, when combining all measures of psychopathologies, the MD-psychopathology association is stronger in community, MD community and clinical samples but weaker in mixed MD and general community or MD and clinical samples. Age also moderates this relationship: associations between MD and anxiety, depression and psychotic symptoms are stronger amongst older participants, while MD-OCD and MD-traumatic experiences associations are stronger amongst younger participants.

Despite data limitations preventing separate analyses for male and female participants, we explored gender's moderating role using the proportion of each gender in the samples. We found that MD's associations with anxiety, depression and dissociation are stronger in samples with a higher proportion of female participants, while MD's associations with OCD and traumatic experiences are stronger in samples with higher male proportions.

Future MD and psychopathology research should focus on recruitment methods and consider age and gender as potential moderators in the study design and analysis.

4.1 | Strengths and Implications

This comprehensive meta-analysis, encompassing a large sample size ($N = 24{,}977$) across diverse studies, significantly enhances the generalisability of our findings on MD. The minimal publication bias and use of meta-analytic techniques ensure robust, reliable results. Our examination of major psychopathologies provides valuable insights into MD's comorbidity with various mental health conditions, supporting its potential inclusion in diagnostic manuals. The study's statistical power underscores MD's clinical significance, making a compelling case for its formal recognition. Such recognition could facilitate targeted interventions, stimulate further research into MD's aetiology and neurobiology, and improve healthcare outcomes. From a policy perspective, inclusion in diagnostic manuals could enhance clinical recognition, increase access to care, reduce stigma and encourage help-seeking behaviour.

The broad associations with various psychopathologies suggest a transdiagnostic perspective for MD, potentially informing broader theories of mental health. Transdiagnostic processes, such as emotional dysregulation, operate across multiple disorders and serve as core mechanisms that prolong distress in conditions like anxiety and depression (Harvey et al. 2004). The internalising–externalising model further supports this view by explaining comorbidity through underlying dimensions, aligning MD with internalising disorders such as depression and anxiety (Krueger and Eaton 2015). Additionally, the Research Domain Criteria (RdoC, Meiering et al. 2023) framework emphasises understanding mental disorders through dimensions of behaviour and neurobiology rather than categorical diagnoses. MD fits within this approach by highlighting shared cognitive and affective processes, such as rumination and emotional regulation, that are relevant across various psychopathologies. These perspectives underscore MD's potential to inform comprehensive theories of mental health that transcend traditional diagnostic boundaries.

However, while these findings strongly support considering MD as a distinct mental disorder, inclusion in diagnostic manuals typically requires additional evidence, including longitudinal studies and more treatment response data. This meta-analysis provides a strong foundation for further investigation of MD as a clinically significant condition, potentially reshaping our understanding of daydreaming-related mental health issues in psychiatric nosology. Future research should focus on identified moderators of the MD–psychopathology relationship, including sample type, age, gender and recruitment methods and assessments, to deepen our understanding of this complex condition.

4.2 | Limitations

A few study caveats are worth noting. The inclusion of only English language publications may introduce language bias, while the mostly cross-sectional nature of the included studies limits causal inferences about MD and psychopathology relationships. Heterogeneity in sample characteristics and measurement tools could affect effect size consistency. The study's scope was restricted by limited moderation variables, focusing only on sample type, age and gender. Interpreting gender's moderating role requires caution, as it was based on participant proportions rather than individual data. Additionally, the reliance on self-reported measures may introduce reporting biases. To address these limitations, future research should explore a broader range of moderators, including cultural background and socioeconomic status. Moreover, employing clinical assessments for both MD and psychopathology could provide a more robust understanding of their relationship, enhancing the depth and reliability of findings in this field.

4.3 | Conclusions

This meta-analysis provides compelling evidence that MD is significantly associated with various mental health problems, challenging the notion that it is merely an intense form of normal daydreaming. MD exhibits comorbidity patterns similar to other DSM disorders, underscoring its significance as a serious mental health issue requiring attention from researchers and clinicians alike.

Future studies should focus on elucidating MD mechanisms and developing effective interventions. They should address both the addictive nature of MD and the underlying psychological issues it may serve to distract from. Advancing our understanding and treatment of MD will help address the substantial distress and impairment experienced by those affected.

Ethics Statement

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data are available upon request from the corresponding author.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.