A Meta-Analysis of the Prevalence of Mental Health Problems among Primary School Students in Mainland China, 2010-2020

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Abstract

The reported detection rates of mental health problems among primary school students in China have been inconsistent. To synthesize the findings and analyze the reasons, a meta-analysis was conducted on relevant studies retrieved from 2010 to 2020. The results showed that: (1) The detection rates of mental health problems among primary school students, from highest to lowest, were sleep problems (25.2%, 95%CI = [0.160, 0.373]), depression (14.6%, 95%CI = [0.120, 0.175]), anxiety (12.3%, 95%CI = [0.063, 0.227]), aggressive behavior (4.1%, 95%CI = [0.017, 0.099]), withdrawal (3.8%, 95%CI = [0.023, 0.062]), rule-breaking behavior (3.7%, 95%CI = [0.018, 0.073]), and somatization (3.6%, 95%CI = [0.017, 0.073]). (2) Measurement tools, diagnostic criteria, and survey period were key factors contributing to the inconsistency in detection rates of mental health problems among primary school students. Overall, aside from relatively high detection rates for sleep problems, depression, and anxiety, the mental health status of primary school students in China was relatively good. Future efforts should develop assessment tools and diagnostic criteria suitable for Chinese primary school students to support the prevention and targeted intervention of mental health problems.

Full Text

Prevalence of Mental Health Problems Among Primary School Students in China from 2010 to 2020: A Meta-Analysis

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Abstract
The reported prevalence rates of mental health problems among primary school students in China have been inconsistent. To integrate these findings and analyze their underlying causes, we conducted a meta-analysis of relevant studies from 2010 to 2020. The results showed that: (1) The prevalence of mental health problems among primary school students, from highest to lowest, were sleep problems (25.2%, 95%CI = [0.160, 0.373]), depression (14.6%, 95%CI = [0.120, 0.175]), anxiety (12.3%, 95%CI = [0.063, 0.227]), aggressive behavior (4.1%, 95%CI = [0.017, 0.099]), withdrawal (3.8%, 95%CI = [0.023, 0.062]), disciplinary behavior (3.7%, 95%CI = [0.018, 0.073]), and somatization (3.6%, 95%CI = [0.017, 0.073]). (2) Measurement tools, diagnostic criteria, and detection periods were key factors contributing to inconsistent prevalence rates. Overall, aside from relatively high rates of sleep problems, depression, and anxiety, the general mental health status of primary school students in China is acceptable. Future research should develop assessment tools and diagnostic standards suitable for Chinese primary school students to support prevention and targeted intervention of mental health problems.

Keywords: primary school students; mental health problems; prevalence; meta-analysis

1 Introduction

With China' s rapid socioeconomic development and intensifying competition, individuals increasingly experience psychological distress in interpersonal relationships and social adaptation. Recent research has revealed that mental health problems are gradually spreading from adults to adolescents and children, showing a "younger age" trend (Du, 2016; Yu et al., 2019). According to WHO estimates in 2020, approximately 50% of mental health problems emerge before age 14, coinciding with the primary school years. Primary school students are undergoing rapid physical and mental development, a critical period for self-awareness, personality growth, and individuality formation. Their mental health status significantly impacts academic achievement and subjective well-being. If mental health problems are not promptly screened, prevented, and intervened, they may develop into lifelong psychological disorders that are difficult to treat. Therefore, as a fundamental prerequisite for improving primary school students' mental health, determining the prevalence of mental health problems to understand their true status is essential for targeted detection and intervention.

Although numerous studies have reported prevalence rates of mental health problems among primary school students, these rates vary considerably due to differences in research design, measurement tools, regions, and sample sizes. For instance, Zhao (2010) found that 25.63% of primary school students had abnormal psychological tendencies, while Zhang and Jing (2019) reported a prevalence rate of only 7.9%. Consequently, consensus on the prevalence of mental health problems among Chinese primary school students remains elu-

sive. The emergence and maturation of meta-analysis methods offer a potential solution. Through quantitative integration of existing research, meta-analysis can not only identify the quantity, proportion, and distribution characteristics of mental health problems but also provide an overall understanding of trends and patterns. Recent studies have used meta-analysis to estimate prevalence rates for specific problems, such as Li et al. (2019), who found a 17.5% prevalence of depressive symptoms among primary school students. However, existing meta-analyses have limitations. First, they have only revealed prevalence rates for partial mental health problems (e.g., depression, anxiety) without covering a more comprehensive range of issues. Second, they have not specifically analyzed mental health problems from the past decade. Rapid social change is an important factor affecting mental health, and China' s economy and culture have undergone tremendous transformations in the past ten years, potentially altering primary school students' mental health status. Finally, previous studies have not sufficiently examined moderating variables. Therefore, it is necessary to integrate prevalence rates of mental health problems among primary school students from the past decade using meta-analysis and explore their influencing factors.

In summary, this study aims to: (1) Use meta-analysis to summarize prevalence rates of mental health problems among primary school students from 2010 to 2020. According to Piaget' s cognitive development theory, primary school students are in the concrete operational stage, characterized by parallel development of emotion, social cognition, and general cognition, all transitioning from "egocentrism" to "decentration" (Liu & Zhang, 2010), which involves taking others as objects of cognition and emotion. This indicates that primary school students' emotional complexity and socialization level increase rapidly upon entering school life. Therefore, emotional and social behavioral problems among primary school students warrant significant attention. Given the numerous mental health indicators, this study adopts Achenbach' s (1966) dichotomy of child and adolescent psychopathological problems, focusing on internalizing problems (including anxiety, depression, somatization, withdrawal, and sleep problems) and externalizing problems (including aggressive behavior and disciplinary behavior). (2) Examine the influence of moderating variables on prevalence rates, specifically discussing the effects of publication year, measurement tools, detection period, gender, region, grade, only-child status, and student residence to comprehensively portray the prevalence of mental health problems.

2.1 Literature Search and Screening

Given the numerous mental health indicators included, the literature search was conducted independently for each problem. Unlike previous similar studies, to ensure more comprehensive inclusion and avoid selection bias, we also searched for unpublished literature. Additionally, we did not limit the search to specific student populations initially, instead applying filters after comprehensive retrieval. Chinese databases included CNKI (journal and dissertation databases),

while the English database was Web of Science Core Collection, with searches limited to abstracts. Chinese search terms combined "anxiety" AND "prevalence" OR "detection rate" ; depression required "depression" AND "prevalence" OR "detection rate" ; somatization required "somatization" OR "somatic complaints" AND "prevalence" OR "detection rate" ; withdrawal required "withdrawal" AND "prevalence" OR "detection rate" ; sleep problems required "sleep problems" OR "sleep disorders" OR "insomnia" AND "prevalence" OR "detection rate" ; aggressive behavior required "aggression" OR "bullying" AND "prevalence" OR "detection rate" ; disciplinary behavior required "disciplinary violations" AND "prevalence" OR "detection rate" . English search terms used "anxi" *AND " prevalence" OR " detection rate" AND " Chin"* ; depression required "depress" *AND " prevalence" OR " detection rate" AND " Chin"* ; somatization required "somati" *AND " prevalence" OR " detection rate" AND " Chin"* ; withdrawal required "withdrawal" AND "prevalence" OR "detection rate" AND "Chin" *; sleep problems required " sleep" OR " insomnia" AND " prevalence" OR " detection rate" AND " Chin"* ; aggressive behavior required "aggress" *OR " bully"* AND "prevalence" OR "detection rate" AND "Chin" *; disciplinary behavior required " disciplin"* AND "prevalence" OR "detection rate" AND "Chin* ". The search period was from January 1, 2010, to December 31, 2020. The initial retrieval yielded 3,126 articles on anxiety, 3,844 on depression, 551 on somatization, 167 on withdrawal, 1,255 on sleep problems, 469 on aggressive behavior, and 126 on disciplinary behavior.

Retrieved literature was imported into EndNote X9 and screened according to the following criteria: (1) Studies must be empirical research and primary sources; theoretical and review studies were excluded. (2) Studies must report prevalence rates or provide necessary information for calculation; studies with unclear data or obvious errors that could not be corrected were removed. (3) Measurement tools must be clearly described. (4) Duplicate publications from the same dataset were counted only once. (5) Participants must be Chinese primary school students or corresponding age group (6-12 years). (6) Participants must not be from special populations, such as students with learning difficulties or hearing impairments. One doctoral student conducted the initial screening, after which three doctoral students randomly selected 10% of excluded and retained literature for each mental health indicator for verification. Discrepancies were resolved through discussion with the initial screener. The final included studies comprised 9 on anxiety, 34 on depression, 12 on somatization, 10 on withdrawal, 11 on sleep problems, 13 on aggressive behavior, and 12 on disciplinary behavior. The literature inclusion process is shown in [Figure 1: see original paper].

2.2 Literature Coding

Each included study was coded for the following characteristics: title, first author, publication year, publication status, sampling region, sample size, mean age, measurement tools, diagnostic criteria, detection period, and prevalence

rate. In addition to overall prevalence rates, subgroup results (including gender, age, residence, etc.) were entered into a sub-database for each study. One doctoral student completed the initial coding, which was then verified by another doctoral student against the original articles. Any inconsistencies were corrected after discussion. Detailed information for all included studies is openly accessible (https://osf.io/7uewg/).

2.3 Publication Bias Control and Assessment

Publication bias refers to the tendency for statistically significant results to be published more readily than non-significant findings (Kuppens et al., 2013). Therefore, searching only published literature cannot represent the entire research landscape. To minimize publication bias, this study included both published literature and unpublished dissertations. Additionally, funnel plots and Kendall' s rank correlation tests were used to assess publication bias. For funnel plots, since increased sample size reduces random variation, an absence of publication bias should yield a symmetrical inverted funnel shape. For Kendall' s rank correlation test, the Tau value (Kendall' s tau) indicates the correlation between effect size and its standard error; non-significance suggests minimal publication bias.

2.4 Model Selection

Meta-analysis primarily employs two methods for estimating overall effect sizes: fixed-effect and random-effects models, which differ in their weighting components. The fixed-effect model assumes that measurement results from all primary studies consist of a common true value and random error, with variation in effect sizes attributed entirely to sampling error. In contrast, the random-effects model assumes that results comprise a true value, systematic error, and sampling error, with differences arising from both sampling error and various systematic errors (e.g., measurement tools, diagnostic criteria). The literature coding process revealed that subgroup reporting varied across studies, making the random-effects model more appropriate. Additionally, Q-test results and I^2 values were used for heterogeneity testing to verify model appropriateness. According to Higgins et al. (2003), if Q-test results are significant or I^2 values exceed 75%, the random-effects model is more suitable than the fixed-effect model.

2.5 Data Analysis

This study used CMA 3.3 software (Comprehensive Meta-Analysis Version 3.3) to conduct meta-analysis of prevalence rates, including overall prevalence estimation and moderator testing. When calculating pooled prevalence rates, CMA software transforms rate data into logit data [logit = Log(p/(1-p))] for analysis (var(logit) = non_{case}), then converts logit results back to rates for output (Card, 2012). Moderator analysis employed two approaches: (1) For continuous

moderators, meta-regression examined significance; (2) For categorical moderators, subgroup analysis tested significance.

3.1 Literature Inclusion

This study included: (1) 9 studies on anxiety (9 effect sizes, 12,691 participants), all journal articles; (2) 34 studies on depression (34 effect sizes, 94,926 participants), including 8 dissertations and 26 journal articles; (3) 12 studies on somatization (12 effect sizes, 41,588 participants), including 3 dissertations and 9 journal articles; (4) 10 studies on withdrawal (10 effect sizes, 37,533 participants), including 4 dissertations and 6 journal articles; (5) 11 studies on sleep problems (11 effect sizes, 17,437 participants), including 1 dissertation and 10 journal articles; (6) 13 studies on aggressive behavior (13 effect sizes, 46,042 participants), including 6 dissertations and 7 journal articles; (7) 12 studies on disciplinary behavior (26 effect sizes, 39,159 participants), including 3 dissertations and 9 journal articles.

3.2 Heterogeneity Testing

Heterogeneity test results are shown in Table 1 . Q-values for all mental health indicators were significant, and I^2 values exceeded the 75% threshold, indicating that the random-effects model was appropriate. These results suggest that variation in prevalence estimates across studies may be influenced by study characteristics, warranting moderator analysis.

3.3 Main Effects Testing

Using random-effects models, we analyzed prevalence rates for each mental health problem: (1) Anxiety prevalence was 12.3%; (2) Depression prevalence was 14.6%; (3) Somatization prevalence was 3.6%; (4) Withdrawal prevalence was 3.8%; (5) Sleep problems prevalence was 25.2%; (6) Aggressive behavior prevalence was 4.1%; (7) Disciplinary behavior prevalence was 3.7% (Table 1).

To demonstrate robustness, sensitivity analysis revealed that after excluding any single study, overall prevalence rates ranged: anxiety 11.1%-15.1%, depression 13.3%-14.6%, somatization 2.9%-4.1%, withdrawal 3.2%-4.2%, sleep problems 21.7%-29.1%, aggressive behavior 3.6%-4.7%, and disciplinary behavior 3.0%-4.2%. These minimal deviations from overall estimates indicate high stability of meta-analytic results.

3.4 Moderator Effects Testing

Anxiety. As shown in Table 2 , moderator analysis revealed: (1) Publication year had no significant effect (b = 0.04, 95%CI = [-0.12, 0.21]), indicating no significant change in anxiety prevalence over the decade; (2) Measurement tools and criteria showed no significant moderating effect, though prevalence rates varied across tools and screening standards; (3) Detection period had

a significant effect, with 3-month prevalence significantly higher than 1-week prevalence, suggesting detection period is an important factor; (4) Regional differences were non-significant, with no obvious differences between eastern, central, and western regions.

Depression. As shown in Table 3 : (1) Publication year had no significant effect (b = 0.01, 95%CI = [-0.07, 0.10]), indicating that although depression prevalence showed an upward trend, the change was not significant; (2) Measurement tools had a significant effect. Prevalence rates across different tools and criteria ranged from 5.7% to 17.4%, with CBCL showing the lowest and CESD the highest rates; (3) Detection period had a significant effect. The 6-month period showed the lowest prevalence, while 1-week showed the highest, an inverse pattern likely related to measurement tools; (4) Gender showed no significant effect, only a tendency toward higher rates in males; (5) Only-child status had no significant effect; (6) Grade level showed no significant effect, though rates decreased from fourth to sixth grade; (7) Student residence and region showed no significant effects.

Somatization. As shown in Table 4 : (1) Publication year had no significant effect (b = -0.04, 95%CI = [-0.23, 0.15]), indicating that although somatization prevalence showed a downward trend, the change was not significant; (2) Diagnostic criteria had a significant effect. The CBCL6 scale standardized with Chinese norms showed significantly higher somatization prevalence than the CBCL98 scale; (3) Although males showed slightly higher rates, gender had no significant effect; (4) Regional differences were non-significant.

Withdrawal. As shown in Table 5 : (1) Publication year had no significant effect (b = 0.008, 95%CI = [-0.13, 0.14]), indicating that although prevalence showed an upward trend, the change was not significant; (2) Diagnostic criteria showed no significant moderating effect.

Sleep Problems. As shown in Table 6 : (1) Publication year had no significant effect (b = -0.13, 95%CI = [-0.27, 0.01]), indicating that although sleep problem prevalence decreased over the years, the change was not significant; (2) Measurement tools showed no significant effect, though CSHQ prevalence was higher than PSQI; (3) Detection period had no significant effect; (4) Gender had no significant effect, only a tendency toward higher rates in males; (5) Regional differences were non-significant.

Aggressive Behavior. As shown in Table 7 : (1) Publication year had no significant effect (b = 0.06, 95%CI = [-0.10, 0.23]), indicating that although aggressive behavior prevalence showed a slight upward trend, the change was not significant; (2) Measurement tools and criteria had a significant effect. BWAQ showed the highest prevalence, followed by CBCL6, with CBCL98 showing the lowest, indicating that measurement tools and criteria are important moderators; (3) Detection period had a significant effect. Studies without specified detection periods showed significantly higher prevalence than those with 6-month periods, suggesting detection period length affects prevalence rates; (4) Although

males showed higher rates than females, gender had no significant effect; (5) Regional differences were significant, with central China showing significantly higher aggressive behavior prevalence than eastern regions.

Disciplinary Behavior. As shown in Table 8 : (1) Publication year had no significant effect (b = 0.08, 95%CI = [-0.09, 0.25]), indicating that although disciplinary behavior prevalence showed an upward trend, the change was not significant; (2) Diagnostic criteria had a significant effect. The CBCL6 scale standardized with Chinese norms showed significantly higher disciplinary behavior prevalence than the CBCL98 scale; (3) Gender had no significant effect, only a tendency toward higher rates in males; (4) Regional differences were non-significant, with no obvious differences among eastern, western, and central regions.

3.5 Publication Bias Assessment

Funnel plots showed that effect sizes for all mental health problems clustered at the top and were generally symmetrically distributed around the mean effect size, suggesting minimal publication bias. Kendall' s rank correlation tests further confirmed this: anxiety (Tau = -0.08, p = 0.75), depression (Tau = -0.19, p = 0.11), somatization (Tau = -0.25, p = 0.24), withdrawal (Tau = 0.09, p = 0.72), sleep problems (Tau = 0.11, p = 0.64), aggressive behavior (Tau = 0.14, p = 0.50), and disciplinary behavior (Tau = -0.02, p = 0.95) all showed non-significant results, indicating no obvious publication bias in this study.

4 Discussion

This study employed meta-analysis to comprehensively integrate mental health indicators and quantitatively synthesize prevalence rates of mental health problems among primary school students over the past decade (2010-2020), examining underlying influencing factors and clarifying overall prevalence rates for various mental health problems.

4.1 Prevalence of Mental Health Problems Among Primary School Students

The results showed prevalence rates of 12.3% for anxiety, 14.6% for depression, 3.6% for somatization, 3.8% for withdrawal, 25.2% for sleep problems, 4.1% for aggressive behavior, and 3.7% for disciplinary behavior. These findings reveal substantial variation in prevalence across different mental health problems, ranging from 3.6% for somatization to 25.2% for sleep problems. This indicates that mental health problems among primary school students cannot be ignored, particularly the top three: sleep problems, depression, and anxiety.

Sleep problems ranked first. By including unpublished literature and examining a decade of research, our prevalence rate differs from Chen et al.' s (2021) meta-analytic result of 38.9%, yet both indicate that sleep problems are common

among Chinese primary school students. This prevalence is not only because many sleep disorders (e.g., night terrors, nightmares, difficulty falling asleep) are more common in childhood (Zhang et al., 2013), but also related to heavy academic burdens that prevent high-quality, adequate sleep (Long et al., 2020). Additionally, excessive electronic device use and mobile phone addiction among primary school students (Lai et al., 2020) can lead to sleep difficulties, warranting widespread societal attention.

Depression ranked second. Our result aligns with the "Mental Health Blue Book" report of approximately 10% prevalence among primary school students (Fu et al., 2021), but is lower than Li et al.' s (2019) meta-analytic finding of 17.5% and Liu et al.' s (2021) result of 17.1%. This discrepancy may be because Li et al. (2019) excluded samples under 200 participants, while Liu et al. (2021) did not search English databases. Thus, our estimate is more comprehensive and precise.

Anxiety ranked third. Our result differs from Li et al. (2019), who found a 18.22% prevalence of social anxiety among left-behind primary school students and 13.76% among non-left-behind students. This difference may stem from our focus on general anxiety rather than social anxiety specifically. Compared internationally, Erskine et al. (2017) found anxiety prevalence of 18.27% in high-income regions and 1.53% in low- and middle-income regions, suggesting economic factors may influence prevalence. As a developing country, China' s prevalence of anxiety among primary school students is moderately high and requires attention.

Although other mental health problems showed relatively low prevalence rates (3.6%-4.1%), some can have serious consequences when they occur. For example, aggressive and disciplinary behaviors not only hinder personality development, socialization, and moral formation but also deteriorate school climate and pose unpredictable safety risks. Therefore, these issues also require focused attention in screening, diagnosis, and intervention. In summary, our findings on prevalence rates over the past decade help grasp the true mental health status of Chinese primary school students, facilitate macro-level monitoring, and provide evidence for improving mental health education and policies.

4.2 Moderating Variables of Mental Health Problems

Publication Year. Results showed that although most mental health indicators increased slightly over time, these trends were not significant. Similarly, Liao and Lian (2019) found a slow improvement in national mental health from 1986-2017. However, contrary findings exist: Xin and Zhang (2009) found declining mental health among secondary school students from 1992-2005, and Yu et al. (2016) found a slow decline among high school students from 1990-2004. Possible reasons include that despite improving mental health service systems, funding, and teacher resources (Wang et al., 2020), accelerated life pace, intensified competition, and high parental expectations expose students (including

primary school students) to multiple pressures and challenges (Huang & Wang, 2020). Thus, prevalence rates have not shown clear year-by-year improvement.

Measurement Tools and Criteria. Except for anxiety, withdrawal, and sleep problems, all other indicators showed significant effects, suggesting caution in scale selection. Notably, even with the same scale, different diagnostic criteria can significantly affect prevalence rates. Specifically, whether the CBCL scale was standardized with Chinese norms influenced prevalence rates of somatization, aggressive behavior, and disciplinary behavior. Therefore, proper selection of assessment tools and criteria, along with standardized and transparent measurement practices, is crucial for accurately evaluating mental health status. Inconsistent measurement tools and criteria likely explain divergent prevalence rates in previous research. For example, Liu et al. (2021) found CES-D yielded a 22.2% prevalence rate while the BID scale yielded only 1.9% for depression. To ensure comparability, future research should develop more scientific tools to unify diagnostic standards. Additionally, large discrepancies may arise because current tools diagnose mental health problems based on simple summation of total scores or symptom counts (Liu et al., 2021). Different tools vary in symptom content and quantity, making it difficult for the same mental health problem to have identical symptom presentations, thereby affecting prevalence rates.

Detection Period. Except for sleep problems, all mental health indicators showed significant differences across detection periods. Generally, shorter detection periods should yield lower prevalence rates than longer or unspecified periods. Notably, depression showed an inverse pattern: 1-week > 2-week > 6-month prevalence, suggesting that measurement tools may influence results more than detection period. Research shows that different scales vary in items, dimensions, evaluation methods, and detection periods, affecting prevalence rates (Liu et al., 2021). Sleep problems showed minimal differences across detection periods, indicating that inconsistent measurement tools and unclear detection periods in current meta-analyses hinder comparison across studies (Jaafari et al., in press). Future research should identify more appropriate and unified measurement tools to obtain more reliable and stable prevalence estimates.

Gender. Over the past decade, although mental health problems showed a tendency toward higher rates in males, gender differences were not significant. Previous research on gender moderation has yielded inconsistent conclusions. Du (2016) found significant gender differences, while other studies found no significant differences (Wei et al., 2007; Yang et al., 2003). This inconsistency may be influenced by sampling conditions and regions. Using meta-analysis to balance random factors, we found no gender divergence in prevalence rates. This may be because: (1) Parental expectations for academic performance, future achievement, and interpersonal relationships are similar for children of different genders (Cheng, 2010); (2) With advancing gender equality education, primary school students encounter increasingly diverse gender role models and cues (Li et al., 2021), and developing cognitive abilities such as reasoning and judgment gradually reduce gender stereotypes. These factors may minimize gender influ-

ences on mental health problems. Future research should further examine such moderating effects.

Region. Results showed no significant regional differences for most indicators, except for aggressive behavior, which was significantly higher in central China than in eastern regions. Over the past decade, compared with the more developed eastern regions, central China has lagged in economic development and mental health education investment, with students having limited access to resources and services (Yu et al., 2017). Research shows that mental health education course implementation follows an "inverted U-shape," with central regions significantly lower than eastern and western regions (Xu, 2005). Consequently, primary school students in central China may struggle to seek timely and effective help when facing psychological distress, resulting in higher prevalence rates. This conclusion is supported by research showing that economically disadvantaged youth are more prone to hostility, have more tense interpersonal relationships, and may exhibit higher rates of aggressive behavior (Zhao, 2005).

In summary, our findings indicate that over the past decade, the overall mental health status of Chinese primary school students has been acceptable, though some problems—particularly sleep problems, depression, and anxiety—remain prevalent. These prevalence rates are influenced by multiple factors including measurement tools, diagnostic criteria, and detection periods. Therefore, emphasizing screening efforts and strengthening mental health education for primary school students is essential.

4.3 Limitations and Future Directions

First, this study included numerous indicators and only searched the Web of Science Core Collection for English literature. Although this platform is comprehensive and authoritative, some studies may have been missed. Future research should search additional databases for more complete meta-analytic data. Second, this study was not pre-registered. Future researchers should emphasize this practice to strengthen the standardization, scientific rigor, and robustness of meta-analytic research by comparing pre-registered hypotheses with subsequent tests. Third, this study adopted the internalizing-externalizing problem framework to focus on typical mental health problems among primary school students. Future meta-analyses could include more indicators for a more comprehensive picture. Fourth, this study focused on prevalence investigation without addressing how to improve mental health. Future meta-analytic research could integrate specific intervention approaches for mental health improvement.

5 Conclusion

(1) Primary school students face varying degrees of mental health problems, with sleep problems, depression, and anxiety ranking as the top three concerns. (2) Measurement tools and diagnostic criteria are key factors causing variation in prevalence rates. (3) Except for sleep problems, de-

tection period significantly influences prevalence rates of mental health indicators. (4) Although region significantly affects aggressive behavior, overall regional effects on mental health problem prevalence are minimal.

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Note: Figure translations are in progress. See original paper for figures.