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Global mental health of secondary school students: a meta-analysis of comparative studies between one-child and multi-child families in China

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Zhang, W¹; Chen, P²; Rao, SY³; Jiang YY⁴; Xiang YT⁵.

Corresponding author:

Wei Zhang

xyutly@gmail.com

Author Affiliation:

University of Macau.

ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 March 2024 and was last updated on 13 March 2024.

INTRODUCTION

Review question / Objective Secondary school students are prone to mental health problems. The findings on mental health of secondary school students between one-child and multi-child families were mixed, therefore we conducted this meta-analysis to compare mental health status between secondary school students from one-child and multi-child families in China.

Rationale This study aims to explore the impact of only children on the mental health of middle school students, fill the gaps in existing research through meta-analysis, and provide theoretical basis and data support for subsequent research and practice.

Condition being studied Secondary school students are prone to mental health problems. The findings on mental health of secondary school students between one-child and multi-child families were mixed, therefore we conducted this meta-analysis to compare mental health status between secondary school students from one-child and multi-child families in China.

METHODS

Search strategy This systematic review and meta-analysis compared the global mental health of secondary school students between one-child and multi-child families in China. This analysis encompassed all relevant studies published up to August 28, 2023. Four independent researchers (WZ, PC, YYJ, and SYR) conducted a comprehensive systematic search in five

databases including PubMed, Web of Science, PsycINFO, China National Knowledge Infrastructure (CNKI), and Wanfang. Relevant studies published in PubMed, Web of Science, PsycINFO, China National Knowledge Infrastructure (CNKI) and Wanfang were searched and those using standard instruments on mental health of secondary school students (e.g., the Middle School Student Mental Health Scale; MSSMHS and the Mental Health Test; MHT) were included.

Participant or population Participants (P): secondary school students from one-child families in China.

Intervention Intervention (I): not applicable.

Comparator Comparison (C): secondary school students from multi-child families in China.

Study designs to be included Study Design (S): cross-sectional, comparative studies with accessible data.

Eligibility criteria The inclusion criteria for this meta-analysis were established following the PICOS acronym: Participants (P): secondary school students from one-child families in China. Intervention (I): not applicable. Comparison (C): secondary school students from multi-child families in China. Outcome (O): standardized assessments developed specifically for middle school students such as the MHT (Zhou, 1991) and MSSMHS (Wang et al., 1997). Study Design (S): cross-sectional, comparative studies with accessible data. The exclusion criteria were: (a) studies on special populations, such as ethnic minorities, left-behind children, street children, and (b) studies conducted during exceptional periods, such as the COVID-19 pandemic. Outcome (O): standardized assessments developed specifically for middle school students such as the MHT (Zhou, 1991) and MSSMHS (Wang et al., 1997).

Information sources This analysis encompassed all relevant studies published up to August 28, 2023. Four independent researchers (WZ, PC, YYJ, and SYR) conducted a comprehensive systematic search in five databases including PubMed, Web of Science, PsycINFO, China National Knowledge Infrastructure (CNKI), and Wanfang. Relevant studies published in PubMed, Web of Science, PsycINFO, China National Knowledge Infrastructure (CNKI) and Wanfang were searched and those using standard instruments on mental health of secondary school students (e.g., the Middle School Student Mental Health Scale;

MSSMHS and the Mental Health Test; MHT) were included.

Main outcome(s) Outcome (O): standardized assessments developed specifically for middle school students such as the MHT (Zhou, 1991) and MSSMHS (Wang et al., 1997).

Data management Data is stored on encrypted personal computers and is backed up regularly to ensure data security and accuracy.

Quality assessment / Risk of bias analysis The quality of included study was evaluated independently by the same four researchers using an 8-item tool designed for epidemiological research (Boyle, 1998; Loney et al., 1998). This tool consists of eight items, including Item 1: Is the target population clearly defined?; Item 2: Is either of the following ascertainment methods used?; Item 3: Is the response rate $\geq 80\%$?; Item 4: Are non-responders clearly described?; Item 5: Is the sample representative of the target population?; Item 6: Are data collection methods standardized?; Item 7: Are validated criteria used to assess for the presence/absence of disease?; Item 8: Are the estimates of prevalence given with confidence intervals and in detail by subgroup?. Each of the eight items in the assessment tool scores one point. The total score, which is the sum of these individual points, reflects the quality of the studies. The studies could be collapsed into low (0-3 points), moderate (4-6 points), or high (7-8 points) quality based on the total score (Yang et al., 2016). In an independent and unbiased approach, four researchers individually assessed each study. To assess publication bias, both a funnel plot and Egger's test were performed.

Strategy of data synthesis Data analyses were conducted using R software (version 4.3.2) (R Core Team, 2023), utilizing the 'meta' package (version 6.5.0). A random-effects model was employed to compute the pooled effect size, i.e., the standard mean difference (SMD), with 95% confidence intervals (CIs) for each study. The heterogeneity between studies is assessed using the I^2 statistic. An I^2 value greater than 50% is considered an indicator of high heterogeneity.

Subgroup analysis To examine potential moderators of group difference, subgroup analyses for categorical variables and meta-regression analyses for continuous variables were carried out.

Sensitivity analysis Additionally, a sensitivity analysis was conducted to ascertain the robustness and reliability of the primary results by

removing studies one by one. Significance level was set at 0.05 (two-tailed test).

Language restriction No.

Country(ies) involved China.

Keywords mental health, meta-analysis, multi-child families, one-child families, secondary school students.

Contributions of each author

Author 1 - Wei Zhang - Author 1 drafted the manuscript, conducted data collection, analysis and interpretation.

Email: yc37674@umac.mo

Author 2 - Pan Chen - The author conducted the data collection, analysis and interpretation.

Email: yc17609@connect.um.edu.mo

Author 3 - Shu-Ying Rao - The author conducted the data collection, analysis and interpretation.

Email: mc34517@um.edu.mo

Author 4 - Yuan-Yuan Jiang - The author conducted the data collection, analysis and interpretation.

Email: yc37670@um.edu.mo

Author 5 - Yu-Tao Xiang - The author conducted the study design and drafted the manuscript.

Email: xyutly@gmail.com