

# INPLASY

## The Role of Information and Social Overload in the Relationship Between Fear of Missing Out and Social Media Fatigue: A Meta-Analytic Structural Equation Modeling Approach

INPLASY202520035

doi: 10.37766/inplasy2025.2.0035

Received: 6 February 2025

Published: 7 February 2025

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### ADMINISTRATIVE INFORMATION

**Support** - This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

**Review Stage at time of this submission** - Data analysis.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202520035

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 7 February 2025 and was last updated on 7 February 2025.

### INTRODUCTION

**Review question / Objective** This study aims to examine the role of information overload and social overload as mediators in the relationship between Fear of Missing Out (FoMO) and social media fatigue using a meta-analytic structural equation modeling (MASEM) approach.

**Condition being studied** This study examines Fear of Missing Out (FoMO) as a psychological phenomenon linked to mental health, characterized by anxiety and compulsive social media engagement. It investigates how FoMO contributes to social media fatigue, a state of emotional exhaustion and disengagement, through the mediating effects of information overload and social overload. Understanding these relationships can provide insights into the mental health implications of excessive social media use.

### METHODS

**Search strategy** A comprehensive literature search was conducted across multiple electronic databases, including ProQuest, PubMed, Web of Science, Scopus, EBSCO, PsycINFO, PsycArticles, CNKI (China National Knowledge Infrastructure), and Wanfang Data. The search aimed to identify relevant studies examining the relationships between Fear of Missing Out (FoMO), information overload, social overload, and social media fatigue. The search was performed using a combination of controlled vocabulary and keyword searches tailored to each database's syntax. The following search terms were used: (1) Fear of Missing Out (FoMO), including "Fear of Missing Out" OR "FoMO"; (2) Social Media Fatigue and Related Concepts, including "social media fatigue" OR "social network fatigue" OR "SNS fatigue" OR "social media burnout" OR "social network burnout" OR "SNS burnout" OR "social media exhaustion" OR "social network exhaustion" OR

"SNS exhaustion"; and (3) Information Overload and Social Overload, including "social overload" OR "social media overload" OR "social network overload" OR "social media fatigue" OR "social network fatigue" OR "SNS overload" AND "information overload" OR "perceived information overload" OR "social fatigue" OR "perceived social overload". Search queries were adapted for each database using Boolean operators (AND/OR) to ensure comprehensive retrieval of relevant literature. For example, in Web of Science, the search string was TS=(("Fear of missing out" OR "FoMO" OR "information overload" OR "perceived information overload" OR "social overload" OR "perceived social overload") AND ("social media fatigue" OR "social network fatigue" OR "SNS fatigue" OR "social media burnout" OR "social network burnout" OR "SNS burnout" OR "social media exhaustion" OR "social network exhaustion" OR "SNS exhaustion")). In CNKI and Wanfang Data, equivalent Chinese search terms were used to ensure comprehensive coverage of Chinese-language studies. The literature search included peer-reviewed journal articles, conference papers, and dissertations. However, only studies with sufficient statistical information for meta-analytic synthesis were included. The final selection of studies followed a systematic screening process based on predefined inclusion and exclusion criteria.

**Participant or population** This review focuses on general social media users without restrictions on specific demographics, populations, or clinical conditions. The included studies examine individuals who engage with social media platforms and experience factors related to Fear of Missing Out (FoMO), information overload, social overload, and social media fatigue.

**Intervention** This study does not involve any specific intervention. Instead, it focuses on synthesizing existing research on the relationships between Fear of Missing Out (FoMO), information overload, social overload, and social media fatigue using meta-analytic structural equation modeling (MASEM). The review aims to assess the strength and direction of these associations based on correlation coefficients reported in previous studies.

**Comparator** This study does not involve a comparative intervention. Instead, it synthesizes existing research examining the relationships between Fear of Missing Out (FoMO), information overload, social overload, and social media fatigue. The analysis is based on correlation

coefficients extracted from previous studies, without a designated comparator group.

**Study designs to be included** This review includes empirical studies that report correlation coefficients between Fear of Missing Out (FoMO), information overload, social overload, and social media fatigue. Eligible study designs include cross-sectional surveys, longitudinal studies, and experimental studies that provide relevant statistical associations. Both published journal articles and peer-reviewed conference papers are considered. Dissertations and theses may also be included if they meet the eligibility criteria and provide sufficient statistical data for meta-analysis.

**Eligibility criteria** The inclusion and exclusion criteria for this meta-analysis were established to ensure the selection of relevant and high-quality studies. Eligible studies must be empirical research that reports correlation coefficients between at least one of the six key variable pairs: Fear of Missing Out (FoMO), information overload, social overload, and social media fatigue (SMF). Only studies published in English or Chinese were considered, and sources included peer-reviewed journal articles, conference papers, and dissertations that provided sufficient statistical data for meta-analysis.

Studies were excluded if they did not report sample size, as this is necessary for weighting studies in the meta-analysis. Meta-analyses or systematic reviews were also excluded, as they do not provide primary data. Additionally, studies that did not report raw correlation coefficients were excluded, as correlation estimates are required for the meta-analytic structural equation modeling (MASEM) approach. Literature published in languages other than English or Chinese was excluded to ensure accessibility and consistency in data extraction. Moreover, studies without full-text access were not included, as they do not allow for proper verification of methodological details and statistical results. Finally, studies that did not report at least one of the six key relationships (FoMO-SMF, FoMO-IO, FoMO-SO, IO-SO, IO-SMF, SO-SMF) were excluded, as they do not contribute to the theoretical framework of this meta-analysis.

**Information sources** The information sources for this review include multiple electronic databases: ProQuest, PubMed, Web of Science, Scopus, EBSCO, PsycINFO, PsycArticles, CNKI (China National Knowledge Infrastructure), and Wanfang Data. These databases cover a wide range of peer-reviewed journal articles, conference papers, and dissertations relevant to the study's focus on Fear

of Missing Out (FoMO), information overload, social overload, and social media fatigue.

In addition to database searches, grey literature such as dissertations and theses will be considered if they provide sufficient statistical data for meta-analysis. If necessary, corresponding authors of relevant studies may be contacted to obtain missing data. No restrictions will be placed on publication year, but only studies available in English or Chinese will be included.

**Main outcome(s)** The primary outcome of this review is the strength of associations between Fear of Missing Out (FoMO), information overload, social overload, and social media fatigue (SMF), as measured by correlation coefficients (Pearson's  $r$ ) reported in the included studies. These correlation coefficients serve as the effect sizes for the meta-analysis and will be synthesized using Meta-Analytic Structural Equation Modeling (MASEM). To ensure normality in effect size distribution, all correlation coefficients will be transformed using Fisher's Z before aggregation. The meta-analysis will be conducted in two stages:

**Stage 1: Meta-Analysis of Correlation Coefficients**

A random-effects meta-analysis will be performed to pool correlation coefficients across studies. The heterogeneity of effect sizes will be assessed using Cochran's Q statistic and  $I^2$  index.

**Stage 2: Structural Equation Modeling (SEM)**

The meta-analytic correlation matrix obtained in Stage 1 will be used to estimate a structural equation model. This model will test the direct and indirect effects of FoMO on SMF, with information overload and social overload as mediators. The mediation effects will be assessed using path coefficients estimated in the structural model.

**Quality assessment / Risk of bias analysis** To assess study quality and risk of bias, several statistical methods will be applied. Publication bias will be examined using funnel plots and Egger's regression test to detect asymmetry in effect size distributions across the six key relationships (FoMO-SMF, FoMO-IO, FoMO-SO, IO-SO, IO-SMF, SO-SMF).

Fail-safe N analysis will estimate the number of null-result studies needed to render effects non-significant, assessing result stability. Leave-one-out (LOO) analysis will iteratively remove individual studies to test whether findings depend on specific data points.

Additionally, influence diagnostics using Cook's distance-based analysis will identify outliers exerting disproportionate influence. Meta-analyses will be re-run after removing such studies to evaluate their impact on overall results. These

analyses ensure the findings are robust, unbiased, and not overly influenced by any single study.

**Strategy of data synthesis** This study employs a Meta-Analytic Structural Equation Modeling (MASEM) approach to examine the relationships between Fear of Missing Out (FoMO), information overload, social overload, and social media fatigue (SMF). The analysis is conducted in two stages using the metaSEM and metafor packages in R.

**Stage 1: Meta-Analysis of Correlation Coefficients**

In the first stage, a random-effects meta-analysis is performed to aggregate correlation coefficients from the included studies. The correlation coefficients between the four key variables (FoMO, information overload, social overload, and social media fatigue) are extracted from each study, and a correlation matrix is reconstructed. The matrices are then synthesized using the `tssem1()` function with a random-effects model (REM) and a diagonal random-effects structure (`RE.type = "Diag"`) to account for between-study heterogeneity. The Fisher's Z-transformation is applied to ensure normality of effect size distributions.

**Stage 2: Meta-Analytic Structural Equation Modeling (MASEM)**

In the second stage, a structural equation model (SEM) is estimated using the meta-analytic correlation matrix obtained from Stage 1. The path model tests the hypothesized mediation effects of information overload and social overload in the relationship between FoMO and social media fatigue. A matrix representation of the structural model is specified using the `create.mxMatrix()` function, and the final model is estimated with `tssem2()`. The model evaluates:

Direct effects (e.g., FoMO → SMF, FoMO → IO, FoMO → SO, IO → SMF, SO → SMF).

Indirect effects (e.g., FoMO → IO → SMF, FoMO → SO → SMF).

Total effects (sum of direct and indirect effects).

**Publication Bias Assessment**

To assess potential publication bias, funnel plots and Egger's regression tests are conducted for each of the six bivariate relationships (FoMO-SMF, FoMO-IO, FoMO-SO, IO-SO, IO-SMF, SO-SMF). Fisher's Z-transformation is applied to convert correlation coefficients before generating funnel plots using the `funnel()` function. Egger's tests are performed using the `regtest()` function to detect asymmetry in the funnel plots, which may indicate publication bias.

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This two-stage MASEM approach provides a robust synthesis of existing literature, allowing for a more precise estimation of the relationships between FoMO, information overload, social overload, and social media fatigue while accounting for study-level heterogeneity.

**Subgroup analysis** Subgroup analyses will be conducted to explore potential variations in effect sizes across different study characteristics. Specifically, the geographical region of the sample will be used as a categorical moderator to examine whether cultural or regional differences influence the relationships among Fear of Missing Out (FoMO), information overload, social overload, and social media fatigue (SMF). Studies will be categorized based on their sample locations (e.g., North America, Europe, Asia) to compare pooled effect sizes across regions.

For continuous moderators, such as mean age and gender ratio (percentage of male participants), meta-regression analysis will be employed to assess their moderating effects. By regressing effect sizes on these continuous variables, this analysis will determine whether variations in age and gender composition influence the strength of associations between FoMO, information overload, social overload, and SMF.

**Sensitivity analysis** To ensure the robustness and reliability of the meta-analytic results, a sensitivity analysis will be conducted using multiple approaches. These include influence diagnostics, leave-one-out analysis, Rosenthal's fail-safe N analysis, Egger's regression test.

**Language restriction** English and Chinese.

**Country(ies) involved** China.

**Keywords** Fear of Missing Out (FoMO), Social Media Fatigue, Information Overload, Social Overload, Meta-Analytic Structural Equation Modeling.

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