

The Correlation of Internet Addiction and Interpersonal Relationship: A Protocol for a Systematic Review and Meta-Analysis

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Protocol

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Abstract

Background: Internet addiction has become a very serious social phenomenon. With the popularity of the internet, more and more people are addicted to the virtual network and ignore the real interpersonal communication. This has a lot of adverse effects on the healthy growth of teenagers. Thus, this systematic review and meta-analysis will access the problems existing in the interpersonal relationship of internet addiction and clarify the correlation between internet addiction and interpersonal disturbance.

Method: We will search the following databases: PubMed, Embase, Medline, Web of Science, China National Knowledge Infrastructure (CNKI), Chinese Biomedical Literature Database (CBM), Wan Fang and China Science and Technology Journal Database (VIP). All observational studies will be included. Study quality will be assessed by the Newcastle-Ottawa Scale. We will use Review Manager 5.3 software for bias risk assessment and data synthesis. We will assess the between-study heterogeneity using I^2 statistics.

Discussion: We will synthesize the existing research to evaluate the correlation between internet addiction and interpersonal relationship of adolescents. This review will provide new ideas for the further intervention of Internet addiction to some extent.

Systematic review registration: PROSPERO International prospective register of systematic reviews: CRD42020177294

Background

Internet use has grown substantially in recent decades. According to the 44th China Internet Development Statistics report, the internet penetration rate has exceeded 60%. As of June 2019, the number of internet users in China reached 854 million, including 847 million mobile internet users [1]. Most studies indicate that the majority of internet users are teenagers, although the internet users are very extensive [2–4]. Based on this, it is extremely important to understand the potential risks associated with Internet use.

Internet addiction (IA) refers to the phenomenon that the internet behavior impulse is out of control under the action of non-addictive substances, and internet users' excessive use of the internet leads to obvious damage to their psychological and social functions [5]. The internet has become a part of people's daily life. Moreover, the problem of internet addiction has aroused widespread concern in the society, and it has been introduced as a risk factor affecting the physical and mental health of teenagers [6]. There are many studies have shown that IA has caused great harm to teenagers' sleep quality [7], mental state [4, 8, 9], etc.

Interpersonal relationship is a term in the study of social psychology. So far, there is not a particularly fixed definition of interpersonal relationship in academic circles [10]. Generally speaking, interpersonal relationship in a broad sense refers to all kinds of relationships between people, and in a narrow sense, it refers to a direct psychological relationship established by people in the process of communication and

interaction. Adolescence is the peak period of teenagers' growth and development. During this period, most teenagers produce their own personality characteristics and learn most of the abilities needed for their own survival. Among the many abilities, interpersonal communication ability has a greater impact on teenagers' life[11]. Teenagers' interpersonal skills directly affect their interpersonal relationship, and further affect many aspects of their lives [3, 4, 12–16]. However, new technologies such as the internet are easier to integrate into the lives of teenagers and arouse their great interest [17]. The internet brings them a sense of freshness and satisfaction so that they are increasingly addicted to the internet. This phenomenon not only seriously affects the development of teenagers' physical and mental health, but also brings great trouble to the family and society [18–21]. More importantly, with the promotion and use of the internet, more and more teenagers tend to communicate with the virtual network [22–24] and become more withdrawn and silent in reality [22, 23, 25, 26]. Those who have interpersonal barriers in reality are more likely to rely on online friendship and communication to meet their needs.

In recent years, several studies have also shown that there are obvious differences in interpersonal relationship between internet addictions and non-addictions [4, 27–29], which may involve peer relationship, teacher-student relationship, parent-child relationship and so on. School-related stress and poor relationship with teachers, parents, and peers are all risk factors for addictive use [30]. However, successful and effective interpersonal communication is the basis for adolescents to participate in society. If it does not get proper development in adolescence, a series of psychological problems will occur. Studies have proved that IA is an important factor causing interpersonal problems among teenagers. So, it is necessary to study IA from the perspective of teenagers, which can provide guidance for further prevention and reduction of IA. Therefore, we designed this protocol to explore the correlation between internet addiction disorder (IAD) and interpersonal relationship more clearly.

Objectives

The purpose of this meta-analysis is to further study the problem existing in the interpersonal relationship of internet addictions and clarify the correlation between internet addiction and interpersonal relationship disorders. It also may analyze the differences between different types of interpersonal relationship.

Methods

We will use the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P) 2015 [31] statement and guidelines to notify the development of the protocol. The checklist is shown in Table S1.

Study registration

The protocol of this systematic review (SR) has been registered in PROSPERO (<http://www.crd.york.ac.uk/PROSPERO>). The registration number is CRD42020177294. Further revisions and additions will be tracked in Prospero.

Eligibility criteria

Study designs

This review covers all studies on the correlation between IA and interpersonal relationship, including all observational studies: cross-sectional studies, case-control studies, and cohort studies. Synthesize the existing research results and make a more clear analysis.

Participants

All adolescents (ages 13 to 25) who are diagnosed with IAD will be included in this study, regardless of their race and gender, to further study the correlation between IA and interpersonal relationship. The diagnostic criteria are consistent with the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [32].

Interventions

This is an observational study without any intervention is used. This study aims to assess the correlation between IA and interpersonal relationship, in order to further clarify the relationship between them.

Comparators

Since most of the included studies are observational, there may be no control group. However, if there is a control group, it may be a healthy person without IAD.

Outcome measures

The primary outcomes are the scale assessment that related to IA and interpersonal relationship, including General situation questionnaire, the Young Internet Addiction Test (YIAT) [33], Chinese Internet Addiction Scale (CIAS) [34], Interpersonal Relationships Integrated Diagnosis Questionnaire (IRIDQ) [35], Quality of life scale for Children adolescents (QLSCA) [36] and so on. Through the comprehensive analysis of the scale score, the relationship between them is discussed. However, the scales used in different studies are different, and we need to consider them comprehensively according to the final included literature.

The secondary outcomes may include parent-child relationship, teacher-student relationship, peer relationship, etc. If possible, we will also summarize and analyze the relationship about different ages, genders, personalities, life experiences and so on.

Exclusion criteria

The exclusion criteria include:

- 1) We will be excluded some other types of addiction research and some unrelated research.
- 2) Some studies with too small sample sizes or missing data should also be excluded.

3) If duplicate data is involved, it can be recorded only once.

Search strategies

PubMed, Embase, Medline, Web of Science, China National Knowledge Infrastructure (CNKI), Chinese Biomedical Literature Database (CBM), Wan Fang and China Science and Technology Journal Database (VIP) will be searched for relevant studies in Chinese and English before March 20, 2020. In addition to the electronic databases, we will also search conference papers, dissertations, and reference lists of relevant reviews, so as to ensure the integrity of the inclusion of the literature.

The search strategy for PubMed is as follows:

#1	Internet OR online OR social media OR smartphone OR web OR internet game OR Facebook
#2	addiction OR pathological OR excessive OR disorder OR overuse OR problem
#3	#1 AND #2
#4	Interpersonal Relation OR Relation, Interpersonal OR Relations, Interpersonal OR Social Interaction OR Interactions, Social OR Social Interactions OR Partner Communication OR Communication, Partner OR Communications, Partner OR Partner Communications OR peer relation OR parent-child relation OR teacher-student relation
#5	#3 AND #4

Selection of studies

All retrieved literature will be managed using Endnote X9 and repeated studies will be filtered. The two examiners (HQH and WJ) will independently screen the study according to the title and abstract based on the pre-set inclusion criteria. The two examiners (HQH and WJ) will then download the full text of all possible relevant studies and further review the full text independently. Two examiners will cross-examine the included studies. Differences will be resolved through discussion or consensus with third-party reviewers (PW). The program selected for the study will be carried out according to the PRISMA flow chart (see Fig. 1).

Data extractions

The two researchers (HQH and WJ) independently extract study data with a pre-defined data extraction form, including: general characteristics (first author, year of publication, language and research country), characteristics of participants (sample size, average age, sex, study population), other characteristics (IAD diagnostic criteria, measurement tools used, interpersonal categories) and outcomes (primary and secondary outcomes). Of course, it also includes more information related to this study.

Risk of bias (quality) assessment

In this study, the Newcastle-Ottawa Quality Assessment Form (NOS) [37] will be used to assess the quality of the selected study. NOS can be used for case control and cohort studies. Cross-sectional studies were evaluated as case control studies. NOS evaluates three quality parameters, selection,

comparability, and results. This scale is divided into eight specific projects, which are slightly different in scoring case control and longitudinal study. Each item on the scale is scored with 1 point, except for comparability, which can be adapted to a particular topic of interest, up to a maximum of 2 points. Therefore, the maximum score for each study is 9. Any study smaller than 5 is identified to be high-risk bias. All stages of the quality assessment process are independently performed by two examiners (HQB and WJ). The differences are resolved through discussion or consensus with third-party reviewers (TY).

Data analysis

We will use Review Manager 5.3 (RevMan) for data analysis. A descriptive synthesis will be carried out for all findings in accordance with the inclusion criteria. A quantitative synthesis will also be used if the included studies are homogenous enough.

We will use the I^2 index to assess the heterogeneity of effect sizes. I^2 index estimates the percentage of variation among effect sizes which can be attributed to heterogeneity. The test of I^2 will be used to detect heterogeneity among included studies. An acceptable heterogeneity is defined when $I^2 \leq 50$, while substantial heterogeneity is considered when $I^2 > 50\%$. We will synthesize the data using a fixed-effects model if the I^2 value is 50% or less, and we will perform meta-analysis. We will use a random-effects model if the I^2 value is greater than 50%.

Publication bias

If the meta-analysis includes 10 or more studies, we will use funnel plots to assess publication bias. When there is no published bias, the figure is symmetrical in the shape of an inverted funnel. When there is publication bias, it will lead to the asymmetry of the funnel diagram and a gap at the bottom. The more obvious its asymmetry is, the more likely it is to have publication bias. If the funnel plots are asymmetrical, we will try to explain the asymmetry of the funnel plot.

Subgroup and sensitivity analyze

In order to study the potential heterogeneity, it is possible to conduct subgroup analysis and sensitivity analysis.

We will conduct a subgroup analysis according to different age ranges, characteristics of participants, different types of interpersonal relationship, etc. In addition, in order to check the robustness of the combined results, we will conduct a sensitivity analysis to assess the impact of studies with a high risk of deviation.

Ethics and dissemination

Since this protocol of systematic review and meta-analysis are based on published studies, ethical approval and patient consent are not required.

Discussion

The interpersonal relationship and IA affect each other. Good interpersonal relationship will inhibit IA, while bad interpersonal relationship will aggravate internet dependence. According to the investigation of Sun Quan [38], the relationship with their parents, classmates and teachers is the order of the degree of interpersonal distress caused by students. The research of Wu Xianhua [39] found that compared with non-internet addicts, internet addicts scored lower in teacher-student relationship, parent-child relationship and peer relationship. It also pointed out that long-term addiction to the internet would make the real interpersonal relationship worse.

To our knowledge, there are many studies on IA and interpersonal relationship, but most of them involve a certain school or a certain type of students. In addition, the choice of research tools is different in different studies, lacking a comprehensive analysis and discussion. Therefore, this meta-analysis will summarize different studies, clarify the interaction between IA and interpersonal relationship. This systematic review(SR) and meta-analysis will not only help internet addicts to build good interpersonal relationship, but also provide new ideas for the intervention of IA to some extent.

Strength and limitations of this study

This review is based on the previous studies to summarize and analyze, further clarify the correlation between IA and interpersonal relationship. This will provide new ideas for intervention of IA.

However, some studies may choose different scales, the results may have a certain degree of heterogeneity. We will choose subgroup analysis and sensitivity analysis according to different situations.

Abbreviations

IA

internet addiction; IAD:internet addiction disorder; CINIC:China Internet Network Information Center; SR:systematic review; PRISMA-P:Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols

Declarations

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Availability of data and materials

Not applicable.

Authors' contributions

TZ and WP conceptualized the study protocol and administered the project. All authors (QH, WP, JW, YT, MQ, YC, YW and TZ) contributed to the development, writing and reviewing of the protocol document. All authors read and approved the final manuscript.

Ethical approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Figures

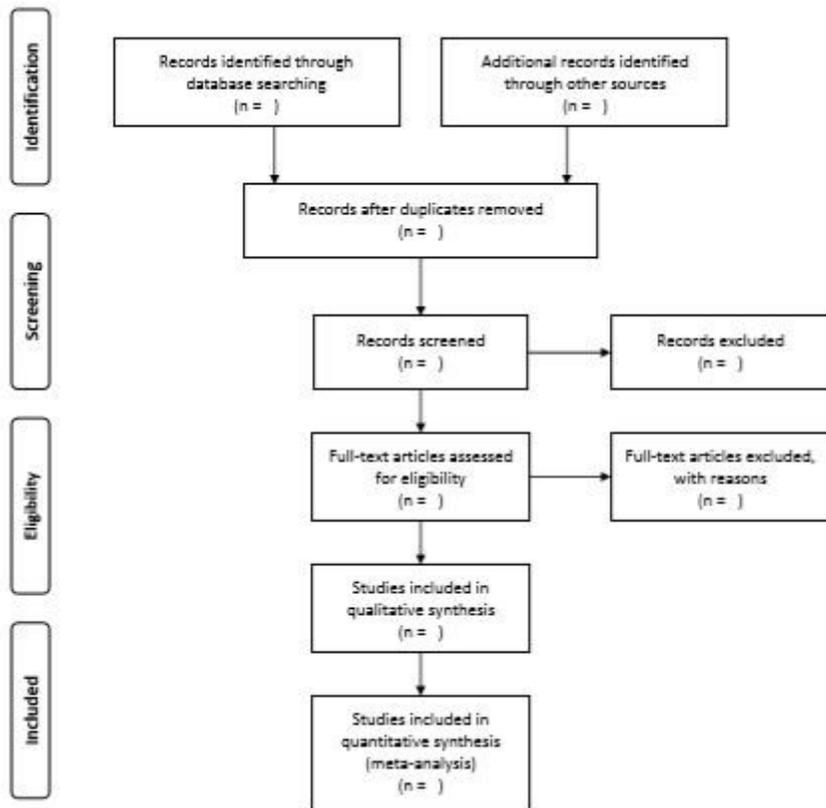


Figure 1

PRISMA 2009 Flow Diagram From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and MetaAnalyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

Supplementary Files

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- [TableS1PRISMAPchecklist.pdf](#)