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Prevalence of Internet Addiction Disorders and its Psychological Impacts Among Adolescents in Pakistan, A Systematic Review

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ABSTRACT

Background: Nowadays, the Internet plays a key role in human daily life. Due to the devastating increase in the number of internet users all over the world. Recently, a significant rise in internet addiction has been reported in Pakistan affecting the psychological well-being of individuals.

Objectives: (1) To evaluate the effects of excessive internet use among adolescents over 13 years in Pakistan. (2) To determine the prevalence of internet addiction based on gender disparity among adolescents in Pakistan. (3) To identify the psychological impact among adolescents due to excessive internet use.

Methods: A systematic review based on published articles identified through different databases: PubMed, PsycINFO, SCOPUS, EBSCO, and Google Scholar. The prevalence of internet addiction was calculated using the internet addiction test (IAT) and psychological outcomes by different assessment scales, including the psychological well-being scale, behavior pattern scale, loneliness scale, Beck anxiety scale, and cyber aggression scale.

Results: Fifteen articles were selected that reported that there is a significant rise in the prevalence of internet addiction varying from 40% to 90% in adolescents, and males reported a greater level of prevalence as compared to females. In addition, there is a significant relationship between internet addiction and depression, emotional disturbance, and stress, and the p-value is <0.05. Moreover, anxiety, loneliness, self-esteem, shyness, and procrastination have also been reported in the participants.

Conclusions: It concluded a significant rise in the prevalence of internet addiction among adolescents in Pakistan and affecting the psychological well-being of the

	individual. Different strategies have been suggested to lower the number of internet addictions and promote physical and mental health.

Introduction:

The internet offers a convenient source for various enjoyable activities, such as sharing thoughts, communicating with people through different forums and social media, and indulging in activities like shopping, gaming, and gambling. Due to easy accessibility and the diverse range of its activities, it results in a potentially addictive platform. Over time, concerns about internet addiction have surfaced as a health issue, resulting in research from various regions like the USA, Europe, and Asia indicating the excessive and problematic usage of the internet among adolescents (Weinstein and Lejoyeux, 2010). The Internet is the most vital tool to communicate with people on social media, learning studies, work, and various entertainment. In 2021, almost 4.9 billion people are using internet services all over the world. The increase was over 567% over the last two decades. In addition, smartphone technology has made it convenient for people to access and utilize internet services easily. In 2021, approximately 3.8 billion people are using smartphones (Wei, 2021). Therefore, due to the extensive rise in the number of internet users, the researchers explain the concepts of internet addiction IA, problematic internet users PIU, or internet addiction disorders IAD (Angelo and Moreno, 2004). Internet addiction disorder is defined as the inability to control the use of the internet leading to physical, psychological, and social difficulties (Naseri et al., 2015). Internet addiction plays a major role in mental health disorders, especially in adolescents. Some of the negative effects are anxiety, insomnia, depression, low self-esteem, mood disorders, self-harm, poor family relationships, suicidal ideation, and suicide (Shapira et al., 2000). The internet is deeply involved in our daily routines, making it impossible to remove it due to potential drawbacks. Therefore, this dependence also brings to light serious issues such as internet addiction, which give rise to significant challenges (Khan et al., 2017). Adolescents are at greater risk of getting internet dependency as compared to other demographics. This susceptibility can be attributed to various factors, including the abundance of free time, unrestricted Internet access, a lack of parental oversight, and the necessity of coursework on the Internet (Ehsan et al., 2021). With time, the Internet has become a significant source of PIU, or “Problematic Internet Usage” among adolescents. Numerous studies identify the effects of excessive internet usage. Prolonged use of the internet leads to decreased appetite, emotional instability, relationship problems, disturbed daily routines, and losing control of their habits. Henceforth, problematic internet use causes significant health risks (Christakis, 2010). According to the study, it is reported that if an individual spends a minimum of five hours per day on the Internet, it should be described as problematic. It was also suggested that after five hours, internet addiction would begin to take hold (Grohol, 1999). Excessive use of the internet also impacts negatively on students’ academic performance. Individuals who are victims of internet addiction prioritize it over their studies, resulting in low grades and poor academic outcomes (Frangos, 2010). Most of the research studies come from Western societies,

concluding a significant lack of research in this field. Because of restricted resources and basic needs like food, some people do not have access to the Internet facility. On the other hand, the majority of individuals living in urban areas are frequent Internet users (Zafar and Suneel, 2018).

Rationale: The current systematic review focuses on the major health concern, making it unique from earlier research studies. Firstly, it shows the number of internet addictions among adolescents. Secondly, compared with past reviews, in Pakistan, no comprehensive review of internet addiction has been done. Thirdly, it also determined the psychological impact among adolescents due to excessive usage of the internet. Due to the increasing number of studies determining the impact of internet addiction disorders among adolescents, there is currently no literature review related to this study in terms of its effectiveness in improving health outcomes for adolescents in Pakistan. Therefore, increase in the available literature highlighting the importance of mental health disorders among adolescents in Pakistan, more studies are required to determine and establish the psychological impacts of excessive use of the Internet. Therefore, the research was initiated to determine the intensity and severity of internet addiction among adolescents in Pakistan.

Aims: The aim is to determine the frequency and extent of internet addiction among adolescents over 13 years of students in Pakistan. This involves calculating the prevalence of students showing signs of internet addiction and evaluating the psychological and behavioral factors associated with internet addiction.

Objectives:

(1) To evaluate the effects of excessive internet use among adolescents over 13 years in Pakistan. (2) To determine the prevalence of internet addiction based on gender disparity among adolescents in Pakistan. (3) To identify the psychological impact among adolescents due to excessive internet use.

Materials and Methods: This systematic review protocol has been prepared following guidelines for the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA).

Research Questions:

1) What is the prevalence of internet addiction among adolescents over 13 years of age in Pakistan?
2) How does the prevalence of internet addiction differ between male and female adolescents in Pakistan?
3) What are the psychological and behavioral factors associated with higher rates of internet addiction among adolescents in Pakistan?
4) What are the psychological impacts of excessive internet use on adolescents over 13 years of age in Pakistan?

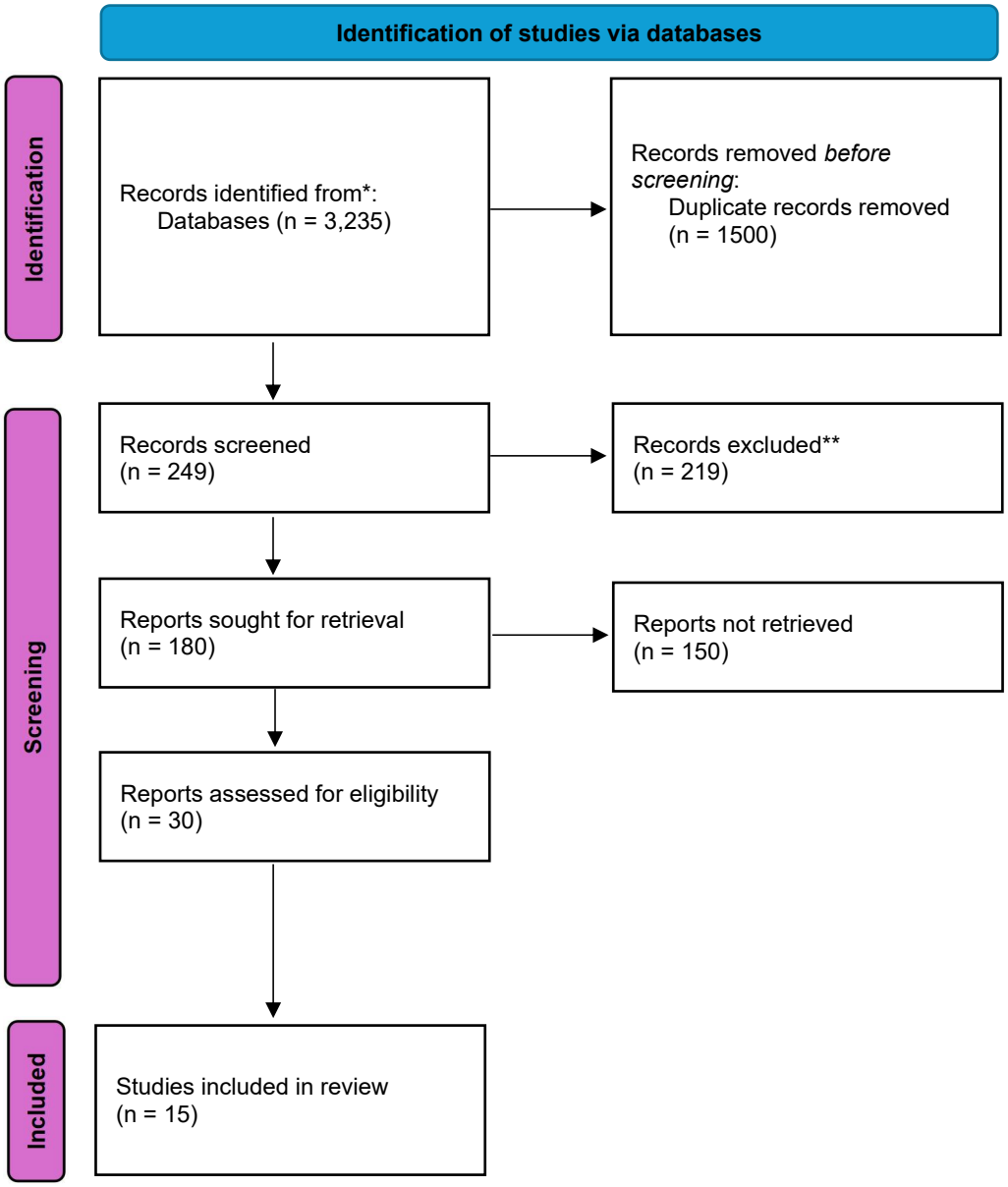
Study designs: The study design includes descriptive, cross-sectional studies. Case series or case report studies not focused on adolescents and internet addiction disorders are excluded.

Search Strategy:

A broad-based search was conducted using different electronic databases including PsycINFO, PubMed, SCOPUS, EBSCO, and Google Scholar. The keywords and mesh terms were used:

internet addiction OR Internet Addiction Disorders AND Adolescents AND Pakistan. The search was restricted to the English language. As shown in Fig. 1, we found 34 studies in PubMed, 11 in SCOPUS, 29 in PsycINFO, 31 in EBSCO, and 3,120 in Google Scholar. Henceforth, 15 articles were included in our systematic review after reviewing these articles. All eligible studies were included using the CASP checklist. A search of the gray literature will also be undertaken using Google Scholar to identify published reports related to internet addiction, such as WHO, United Nations, and Government of Pakistan reports.

Table 1. PRISMA Flowchart.



Study Selection:

Inclusion Criteria and Exclusion Criteria:

The inclusion and exclusion criteria have been established using the PEO acronym as follows:

Table No. 2: Research questions based on PEO Framework

PEO Framework	
Population	Adolescents over 13 years old in Pakistan
Exposure	Internet addiction and internet addiction disorders
Outcome	Psychological outcomes

Population:
The population of interest is all adolescents over 13 years old in Pakistan. Studies that included a mixed population including, high school, undergraduate, and postgraduate students, were also included.

Exposure:
Studies focus on the effects of internet addiction and internet addiction disorders among adolescents over 13 years of age in Pakistan.

Outcome:
All psychological outcomes due to internet addiction and internet addiction disorders among adolescents over 13 years in Pakistan.

Quality Assessment of the Included Publications:
The best available evidence can be synthesized through systematic literature review, but these types of epidemiological studies have significant limitations and methodological specifics because of the observational studies from which they originate. Therefore, the CASP checklist was utilized for this review. The prior quality evaluation of the studies that needed to be reviewed included the items on this checklist. The quality of the antecedents, the explanation of the methodology, the presentation and discussion of the findings, and the authors' ultimate conclusions were all examined as part of the verification process.

Table no. 3: Checklist for Critical Appraisal Skills Programme.

Study	Did the review address a focused question?	Did the authors look for the right type of papers?	Do you think all the important, relevant studies were included?	Did the review's authors do enough to assess the quality of the studies?	If the review results have been combined, was it reasonable to do so?	What are the overall results of the review?	How precise are the results?	Can the results be applied to the local population?	Were all important outcomes considered?	Are the benefits worth it?	Total Score
Ahmer and Tanzil, 2018	yes	yes	yes	yes	yes	yes	no	no	no	yes	8
Azher et al., 2014	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	9
Ehsan et al., 2021	yes	yes	yes	no	yes	yes	no	no	no	yes	6
Javaeed et al., 2019	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	10
Khan et al., 2017	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	9
Memon, 2021	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	9
Rustam et al., 2017	yes	yes	yes	no	no	no	no	yes	no	yes	5
Saleem et al., 2015	yes	yes	no	yes	yes	yes	yes	no	no	yes	7
Saleem et al., 2015	yes	yes	yes	yes	yes	yes	yes	no	no	yes	8
Sohail et al., 2020	yes	yes	yes	yes	yes	yes	yes	no	no	yes	8
Thakur et al., 2020	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	9

Waqas et al., 2018	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	9
Zafar and Suneel, 2018	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	9
Zahid and Rauf, 2022	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	10
Zulfiqar and Khan, 2024	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	9

Data Synthesis:

A template will be used to organize the extracted data. Studies will be grouped, and the review results will be tabulated separately according to study type. The study was approved by the Ethics Review Committee at Anglia Ruskin University Chelmsford.

Data Extraction:

The data was extracted from each study; sample size, sample source, study design, method of internet addiction scale, prevalence of internet addiction, and its psychological impact on the participants.

Table No. 4: Characteristics of Included Studies.

No	First Author, Year of Publication	Study Design	Sample Size	Data Collection Tool	Prevalence of Internet Addiction Disorder	Gender-wise Comparison of IAD in Males	Gender-wise Comparison of IAD in Females	Psychological Outcomes
1	Ahmer and Tanzil, 2018	Cross-sectional	340	YIAT	85%	M= 42.5%	F= 57.4	Ignored Academics= 39.7%, Emotional irregularities= 38%, Distraction= 69.8%
2	Azher et al., 2014	Cross-sectional	300	IAT, Beck Anxiety Scale	34%	M= 48.42, SD= 11.75	F= 38.73, SD= 11.71	Anxiety (M= 38.27), (F=36.71)
3	Ehsan et al., 2021	Cross-sectional	380	YIAT	90.30%	M= 49.3%, 40.8%,2.7%	F= 63.8%, 24%, 1.2%	NA
4	Javaeed et al., 2019	Cross-sectional	210	YIAT	96.70%	M= 36	F= 36	Depression= 68.5%, Anxiety= 84.7%, Stress=58.1%
5	Khan et al., 2017	Cross-sectional	322	YIAT	16.70%	M= 37.71 SD= 11.99	F= 38.63 SD= 14.00	NA
6	Memon, 2021	Cross-sectional	263	YIAT	85.17%	M= 52.77 SD= 14.67	F= 39.28 SD= 13.38	NA
7	Rustam et al., 2017	Cross-sectional	200	YIAT	73%			Loss of Sleep=13.1%, Neglect Household Chores=7%
8	Saleem et al., 2015	Cross-sectional	400	YIAT, Procrastination Assessment Scale for Students		M= 45.84 SD= 15.20	F= 43.49 SD= 18.77	Procrastination, M=34.49%, F= 35.03%

9	Saleem et al., 2015	Cross-sectional	1020	YIAT, UCLA Loneliness Scale	28%	M= 51.19, St Error =0.433	F= 49.99, St Error =0.419	Loneliness, low level= 51%, Moderate=35.5%, Severe=13.5%
10	Sohail et al., 2020	Cross-sectional	100	YIAT, Behavior Pattern Scale	79.00%			Neglect Social Life= 77%, Anticipation= 40.23%, Salience= 78.14%
11	Thakur et al., 2020	Cross-sectional	120	IAT, collective self-esteem (CSES), Shyness scale	55.27%	M= 54.6 SD= 10.67	F= 55.67 SD= 7.69	Self-esteem= 46.15, Shyness= 22.46
12	Waqas et al., 2018	Cross-sectional	522	IAT	38.10%			Denial, Autistic, Passive aggression
13	Zafar and Suneel, 2018	Cross-sectional	150	IAT		M= 48.46 SD= 18.84	F= 40.14 SD= 15.64	NA
14	Zahid and Rauf, 2022	Cross-sectional	150	YIAT, Ryff Psychological Well-Being Test.				Psychological well-being, p=0.30
15	Zulfiqar and Khan, 2024	Cross-sectional	200	YIAT	62 SD= 13.43			NA

Results:

A total of 3,235 articles were identified through the initial database search. After removing duplicates and screening titles and abstracts, 30 articles were reviewed in full text. Of these, fifteen (15) studies met the inclusion criteria and were included in the final analysis. The included studies consisted of a cross-sectional study design. The sample size ranged from 100 to 2700 participants. Studies contain participants older than 13 years in Pakistan. Most studies used standardized assessment tools such as the Internet addiction test (IAT) and the Young's Internet Addiction Scale (YIAS) to measure internet addiction. However, few of the studies used the psychological well-being scale, behavior pattern scale (BPS), loneliness scale, Beck anxiety scale (BAS), and cyber aggression scale (CAS) to determine the psychological impact of the subject having internet addiction disorder.

Prevalence based on Gender Differences:

In this section, fifteen studies used the IAT for internet addiction assessment in adolescents, showing that there is a significant rise in the prevalence of internet addiction varying from 40% to 90% in adolescents. Nine cross-sectional studies from Punjab, a province of Pakistan, with a representative sample of the adolescent population. These articles showed varied levels of prevalence of addiction to the internet in the participants. The prevalence reported for internet addiction is higher in male participants than in females, and the p-value is less than 0.05, which is found to be statistically significant. However, one study conducted in Lahore showed that females have an increase in the prevalence of internet addiction than males, and the Confidence interval (CI) is found to be (0.46-2.34), which is statistically significant. Chen's Internet Addiction Scale was also used in a study including adolescents showing that 28% of the participants are using an excess of the Internet. Two publications from Sindh, a province of Pakistan, found that almost 85% of the participants are addicted to the Internet. Moreover, there is a correlation between the score of internet addiction and gender, and the p-value is found to be <0.05, which is significant statistically. Two articles from Azad Kashmir, Pakistan, have been studied and revealed that more than 75% that is one-third of the participants are addicted to the internet. Additionally, almost 40% of the subjects reported moderate to severe internet addiction disorder. Three articles from KPK were studied and determined that more than half that is 50% of the participants are victims of Internet addiction disorders. Furthermore, it is also concluded that male participants reported higher levels of internet addiction than females, and the p-value is <0.05. Therefore, the correlation between gender differences and internet addiction is found to be significant.

Psychological Impact Based on Gender Differences:

The articles from Punjab concluded that most of the male participants ($M = 38.27$, $SD = 8.54$) reported more anxiety than the females ($F = 36.71$, $SD = 10.46$), and there is a positive correlation between anxiety and internet addiction ($y = 0.308$, $p<0.001$). Furthermore, almost half of the adolescents have moderate to severe levels of loneliness, and there is a relationship between internet addiction and loneliness. The result is statistically significant; the p-value is less

than 0.05 and the R-square is 0.029. The result also reported self-esteem, shyness, and procrastination in adolescents due to internet addiction. Moreover, the outcomes are proven to be statistically significant based on the p-value. The articles from Sindh determined that participants who have internet addiction have various psychological outcomes due to internet addiction. However, 39% of the adolescents ignored academics, and 38% had irregularities in emotional behavior, which is statistically significant, and the p-value is <0.05. Furthermore, depression, nervousness, and moody behavior have been reported in 39.92% of the participants when they go offline. The studies from KPK revealed no relationship between internet addiction and psychological well-being; the correlation is ($r = -0.218$, $p = 0.030$) which is greater than 0.05. Therefore, the result is non-significant. However, 19.2% of the participants with internet addiction have frequent episodes of insomnia. Articles from Azad Kashmir determined depression, anxiety, stress, emotional disturbance, and lack of control in the participants having internet addiction disorders. However, most of the male participants reported anxiety and depression as compared to females. In addition, there is a significant relationship between depression, emotional disturbance, and stress, and the p-value is found to be <0.05.

Discussion:

The Internet has globally removed all types of hurdles and barriers, helping people to connect with one another and providing unlimited information about every aspect of life (Mahmood and Farooq, 2014). Furthermore, excessive use of the internet causes a negative impact on the social behavior of the community and leads to numerous psychological disorders, which are now included in the DSM-V (Li and Lin, 2014). The study was conducted to estimate the prevalence and keep in view the risk due to internet addiction. However, the findings of our study showed that the prevalence of internet addiction varied from 40% to 90%; however, similar findings from studies conducted in Nepal and India determined the prevalence of internet addiction between 56.5% and 84.6% making it the major health concern. (Pramanik, Sherpa, and Shrestha, 2012; Ganapathi et al., 2015; Chaudhari et al., 2015). Therefore, an increase in the number of internet addicts leads to different health-related problems which makes it a major health problem for the community. Additionally, other studies also support our hypothesis that male participants are more addicted to the internet than females (Shao et al., 2018; Akdemir et al., 2017). Another study conducted in high schools in Hong Kong concluded that the majority of adolescent male students have a higher level of addiction to the Internet than females, which aligns with our current findings (Shek and Yu, 2016). The results from students in Isfahan's universities also showed male participants predominance over females (Alavi et al., 2011). Moreover, another research also calculated the male predominance based on p-value and revealed that more males are victims of internet addiction than females, and there is a significant relationship between gender and internet addiction. The result is statistically significant, and the p-value is found to be less than 0.05 (Odaci and Kalkan, 2010). These results are in contrast with those conducted in Taiwan, which concluded that female internet addiction was higher than that of male addiction (Chiu et al., 2013). However, another research studies have not observed any changes in the mean internet addiction level between males and females (Ranganatha and Usha, 2017).

The current study showed the psychological effects on the individual due to addiction to the Internet. Due to excessive use of the internet, an individual fails to achieve their aims and is unable to attain the potential to live a productive life (Thakur et al., 2020). Moreover, the negative effects that are reported in our study include anxiety, insomnia, low self-esteem, and depression (Shapira et al., 2000). Previous research also discovered a positive association between internet addiction and the psychological well-being of the participants, which is aligned with our findings (Cardak, 2013). The study conducted in India determined the positive correlation between internet addiction and depression, anxiety, and stress (Panicker and Sachdev, 2014). A similar finding was discovered in a study conducted in undergraduate students in the US that linked internet addiction with emotional irregularities (Hormes et al., 2014). The findings from our study revealed a relationship between internet addiction and shyness. People can satisfy their emotional and social requirements on the internet that may not be satisfied in their conventional offline networks. When communicating online rather than in person, a shy individual may feel comfortable and relaxed communicating through the Internet, which could cause him to get addicted to the Internet (Schneider and Amichai, 2010). Loneliness is a major health concern that affects adolescents who are addicted to the internet, leading to life dissatisfaction. A similar result of another study confirmed the correlation between internet addiction and loneliness based on the p-value >0.05 which is statistically significant (Ang et al., 2012). However, another research revealed an insignificant relationship between loneliness and internet addiction and the p-value is greater than 0.05 (Appel et al., 2012). Furthermore, another study also showed a correlation between internet addiction, academic performance, and procrastination (Scherer, 1997). In short, excessive use of the internet causes various mental health-related disorders, affecting the living condition and day-to-day daily activities, which is a major concern to the stakeholders and health professionals

Strengths:

The current systematic review aims to incorporate all the relevant studies on a particular topic, regardless of their findings. This review is certain to cover a wide range of evidence by using an extensive approach that provides readers with a full understanding of the study. It also lessens the possibility of selection bias by methodically searching for and evaluating papers from various sources. Through a systematic review of cross-sectional studies, researchers can compile data and establish stronger conclusions than they could from a single study. This was particularly valuable when researching phenomena with a significant level of variability or when attempting to extend results to other populations or settings. Furthermore, cross-sectional studies are observational and vulnerable to bias, a systematic review can lower these drawbacks by evaluating the quality of the included studies rigorously, estimating the risk of bias, and taking these aspects into account when synthesizing the results. The current study follows a specified protocol that describes the research questions, inclusion criteria, and procedures for data extraction and analysis. It also undergoes critical assessment procedures in order to assess its level of quality, relevance, and bias risk. Moreover, through a summary of the available data, the study can recognize areas of knowledge that still require further investigation. This may assist in

prioritizing research efforts and directing further investigations. Additionally, this research is highly valued in evidence-based practice, providing an accurate and trustworthy assessment of the evidence that supports decisions about clinical, educational, and policy matters.

Limitations:

The credibility of a systematic review is mainly dependent upon the caliber of the study it summarizes. However, the conclusion could be compromised if the included studies possess poor quality or flaws in their design, methodology, and reporting. The current study has limitations due to the inclusion of only 15 articles, which limits the comprehensiveness of our findings. Furthermore, the limitation of the search strategy and inclusion of only English studies conducted in Pakistan also resulted in the exclusion of some relevant papers. These weaknesses could be biases in the way the study was designed, results that were reported incompletely or selectively, or there was not sufficient power in statistics to identify meaningful effects. Because of this, the conclusions drawn from these studies need to be evaluated, as they might not completely or precisely represent the essence of the phenomenon under investigation. Therefore, it may be challenging to reach firm conclusions because of outcomes that are not statistically significant. Therefore, research from other languages and geographical areas should be included in future research to overcome the drawback of the limited search strategy. Non-English literature should be translated, or working with multilingual researchers could reveal valuable insights that were previously missed. Despite efforts to reduce this bias, an attempt was made to search for unpublished research and gray literature, but they are not always efficient at achieving so, and the bias may still exist and affect the result.

Conclusions:

This systematic literature review allowed us to find and process valuable information on the prevalence and behavior of the subjects due to internet addiction in Pakistan. The study indicated an increase in the prevalence of internet addiction among adolescents in Pakistan. The findings also discovered a significant relationship between gender differences in internet addiction. It was concluded that the majority of internet addicts are males as compared to females. However, we have observed different psychological outcomes due to internet addiction and how it affects the individual's daily life. There is a significant correlation between internet addiction and depression, anxiety, stress, and emotional disturbance. Moreover, loneliness, self-esteem, shyness, and procrastination have also been reported in the participants having internet addiction.

Recommendations:

This suggests that there are growing cases of internet addicts in the country. Therefore, ongoing research is needed in the future that may offer diagnostic and therapeutic approaches to control the alarming number of internet addicts. Moreover, this study also suggests mass media awareness regarding excessive use of the internet and its psychological effects. Policies and guidelines must be implemented to lower potential risks and promote physical and mental health. It is also suggested that representative samples of the general population be incorporated, especially in regions where research has never been conducted. New studies need to be carried out in Pakistan to eliminate the methodological weakness of the previously conducted studies.

Active participation of the government and funding is required to reduce the prevalence of internet addiction and its psychological impact among adolescents in Pakistan.

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