



PHARMACOLOGICAL TREATMENT OF BEHAVIORAL ADDICTIONS: A SYSTEMATIC REVIEW WITH NARRATIVE SYNTHESIS

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ABSTRACT

Introduction: Behavioral addictions represent a heterogeneous group of conditions characterized by repetitive reward-seeking behaviors, impaired control, craving, persistence despite harm, and significant psychosocial dysfunction. Gambling disorder and gaming disorder are formally recognized within ICD-11, whereas compulsive buying-shopping disorder (CBSD), compulsive sexual behaviors disorder (CSBD), problematic pornography use, internet-related addictions, and food addiction remain diagnostically debated or variably classified. Although psychosocial interventions remain the first-line treatment, pharmacological approaches have increasingly been explored, particularly in severe, treatment-resistant, impulsive-compulsive, or comorbid presentations.

Aims and Objectives: To systematically review and narratively synthesize available evidence regarding pharmacological interventions for behavioral addictions as mentioned in background

Materials and Methods: A PubMed/MEDLINE-based literature search identified 104 potentially relevant records related to behavioral addictions and pharmacological therapy. Out of these, 24 human studies focusing exclusively on pharmacotherapy, including randomized controlled trials (RCTs), open-label studies, observational studies, retrospective studies, case reports/series, systematic reviews, and treatment guidelines were evaluated. Owing to substantial heterogeneity in diagnostic criteria, interventions, outcome measures, and study methodologies, findings were synthesized narratively rather than quantitatively.

Results: The strongest evidence was identified for gambling disorder, particularly for opioid antagonists. CSBD demonstrated limited but clinically meaningful evidence for selective serotonin reuptake inhibitors (SSRIs) and naltrexone, especially in patients with obsessive-compulsive, anxiety-related, or reward-driven symptom profiles. In gaming disorder and internet-related addictions, bupropion showed the most consistent benefit. Evidence for other disorders remain weak or mixed.

Conclusion: Pharmacological agents may provide adjunctive benefit in selected patients with severe craving, impulsivity, compulsivity, psychiatric comorbidity, or relapse despite psychotherapy. Larger, well-designed RCTs using standardized diagnostic frameworks and longer follow-up periods are required to clarify the role of pharmacotherapy across behavioral addictions.

Keywords: Behavioral Addiction, Gambling Disorder, Gaming Disorder, Compulsive Buying-Shopping Disorder, Compulsive Sexual Behaviors Disorder, Internet Addiction, Food Addiction, Naltrexone, SsrIs, Bupropion.



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INTRODUCTION

Behavioral addictions are increasingly recognized as clinically significant disorders involving repetitive engagement in rewarding non-substance-related behaviors despite adverse psychosocial consequences. Core psychological features include impaired control, compulsive engagement, craving, emotional dysregulation, salience, persistence despite harm, and relapse after attempts at reduction or abstinence. Although these conditions do not involve ingestion of psychoactive substances, they demonstrate substantial overlap with substance use

disorders in terms of neurology, phenomenology and treatment principles. [1-3]

Among behavioral addictions, gambling disorder has the strongest diagnostic and research foundation and is formally classified under “disorders due to addictive behaviors” in ICD-11[4]. Gaming disorder has similarly gained formal recognition in ICD-11[4], although concerns remain regarding diagnostic over pathologization, sociocultural context, and differentiation from excessive but non-pathological gaming. Other behavioral syndromes, including compulsive buying-shopping disorder (CBSD), compulsive sexual behaviors disorder (CSBD), problematic pornography use, internet addiction, and food addiction, continue to remain diagnostically heterogeneous and variably conceptualized. Compulsive sexual behaviors disorder is included within ICD-11[4] under impulse-control disorders rather than addictive disorders. Food addiction remains controversial because of conceptual overlap with binge-eating disorder, obesity, emotional eating, and reward-driven eating patterns. Likewise, compulsive buying-shopping disorder lacks formal diagnostic status in DSM-5-TR despite increasing clinical recognition. The clinical burden associated with behavioral addictions is substantial. These disorders may result in financial losses, occupational/academic impairment, relationship dysfunction, emotional distress, legal complications and elevated psychiatric comorbidity. Common co-occurring conditions include depressive disorders, anxiety disorders, obsessive-compulsive symptoms, Attention deficit Hyperactive Disorder (ADHD), substance use disorders, personality pathology, and impulse-control difficulties. Current management strategies emphasize psychosocial interventions as first-line treatment. Cognitive behavioral therapy, motivational interviewing, relapse prevention, psychoeducation, family interventions, and disorder-specific behavioral approaches remain central to management [5-6]. However, pharmacological interventions have increasingly been investigated, especially in severe, persistent, impulsive-compulsive, or treatment-resistant presentations. The rationale for pharmacotherapy derives from shared neurobiological pathways between behavioral and substance addictions. Dysregulation involving mesolimbic dopaminergic reward circuits, serotonergic modulation of impulsivity, glutamatergic dysfunction, impaired prefrontal inhibitory control, and opioid-mediated reward reinforcement has been implicated across several behavioral addictions. Consequently, multiple pharmacological classes have been studied, including opioid antagonists, SSRIs, glutamatergic agents, mood stabilizers, antidepressants, ADHD medications, and other agents. [7-9] Despite increasing interest, the available literature remains

fragmented. Many studies are limited by methodology, follow-up periods and heterogeneity in outcome measures. Therefore, a structured synthesis of the available evidence is clinically relevant. The present review aims to synthesize and critically evaluate pharmacological interventions across major behavioral addictions, including compulsive buying-shopping disorder, compulsive sexual behavior disorder/problematic pornography use, internet-related addictions/gaming disorder, gambling disorder, and food addiction.

METHODOLOGY

Study Design: This article was conducted as a systematic review with narrative synthesis. Systematic review was done according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines. Narrative synthesis was chosen because of significant heterogeneity across included conditions, diagnostic criteria, pharmacological agents, outcome measures, study designs, and follow-up durations. Owing to this heterogeneity, formal meta-analysis was not feasible.

Literature Search Strategy: A systematic literature search was conducted using PubMed/MEDLINE. The search included studies published up to 2025. The search aimed to identify studies examining pharmacological interventions for behavioral addictions and related compulsive reward-driven disorders.

The following keywords and Boolean operators were used:

(behavioral addiction OR gambling disorder OR gaming disorder OR internet gaming disorder OR internet addiction OR compulsive buying OR compulsive shopping OR compulsive sexual behavior disorder OR hypersexual disorder OR problematic pornography use OR food addiction) AND

(Pharmacotherapy OR pharmacological treatment OR antidepressants OR selective serotonin reuptake inhibitors OR naltrexone OR nalmefene OR bupropion OR topiramate OR memantine OR atomoxetine OR methylphenidate OR N-acetylcysteine OR glutamatergic agents OR opioid antagonists. The initial search yielded 104 potentially relevant records. Additional clinically relevant guideline documents and diagnostic framework references were included where necessary for contextual interpretation.

Inclusion Criteria:

Studies and documents were included if they fulfilled the following criteria:

1. Human studies or clinically relevant guideline documents.
2. Focus on behavioral addictions or closely related behavioral addiction-spectrum disorders (gambling disorder, gaming disorder, internet addiction, compulsive buying-

- shopping disorder, compulsive sexual behavior disorder, problematic pornography use, or food addiction)
3. Included pharmacological interventions or pharmacotherapy-related evidence.
 4. Published in English.
 5. Included randomized controlled trials, open-label trials, observational studies, retrospective studies, systematic reviews, meta-analyses, case reports/series, or treatment guidelines.

Exclusion Criteria:

Articles were excluded if they met any of the following criteria:

1. Animal studies only.
2. Articles unrelated to behavioral addictions.
3. Studies focusing exclusively on substance use disorders.
4. Articles examining psychotherapy alone without pharmacological relevance.
5. Editorials, commentaries, or opinion pieces without clinically useful data.

6. Non-English articles.
7. Duplicate records.
8. Studies in which behavioral addiction symptoms were incidental rather than the primary clinical focus.

Study Selection

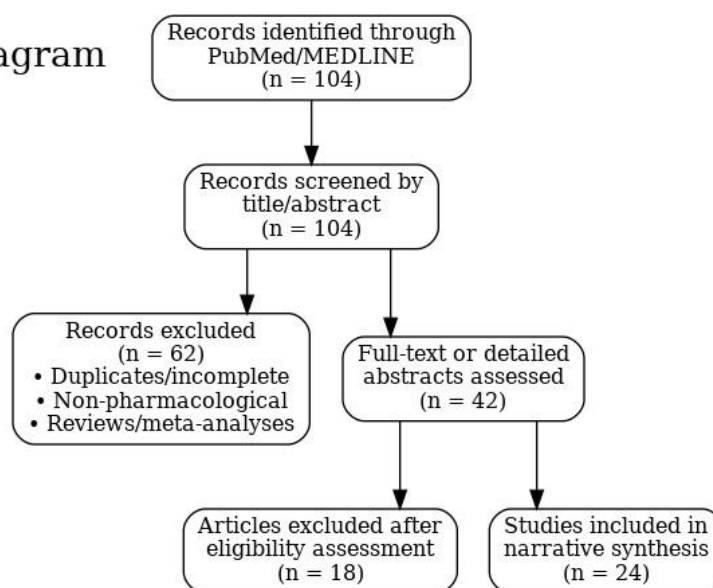
Titles and abstracts of all retrieved studies were screened for relevance. Full texts or detailed abstracts were subsequently reviewed where available. Included studies were grouped according to behavioral addiction subtype and pharmacological class.

The final narrative synthesis was organized under the following categories:

1. Compulsive buying-shopping disorder
2. Compulsive sexual behavior disorder/problematic pornography use
3. Internet-related addictions/gaming disorder
4. Gambling disorder
5. Food addiction

PRISMA Flow Summary (Fig 1):

Figure 1. PRISMA Flow Diagram



Reviewer Screening Procedure

Three authors independently participated in the screening and selection process. Initially, titles and abstracts retrieved through the literature search were independently screened for relevance by two reviewers. Full texts or detailed abstracts of potentially eligible studies were subsequently assessed independently for inclusion. Any disagreements regarding study eligibility, inclusion, exclusion, or categorization were resolved through discussion and consensus with the third reviewer. Data extraction and methodological categorization were similarly reviewed collaboratively to improve accuracy and reduce selection bias. Risk-of-bias assessment were also performed independently and finalized through consensus discussion among all

three authors.

Data Extraction Formulation:

Data Extraction Variables

The following variables were extracted from included studies:

1. Author and year of publication
2. Behavioral addiction subtype with use of appropriate scales like PG-YBOCS^[10], YBOCS-SV^[11], Youngs Internet Addiction Scale^[12]
3. Study design
4. Sample size
5. Pharmacological intervention
6. Comparator/control (where applicable)
7. Main clinical outcomes/findings

Data Filtration

The included studies comprised randomized controlled trials, placebo-controlled trials, comparative clinical studies, observational studies, pooled analyses, retrospective studies, case series, and isolated case reports evaluating pharmacological interventions across behavioral addictions. The studies addressed five major behavioral addiction subtypes as mentioned in “study selection” heading.

The pharmacological agents studied included opioid antagonists (naltrexone, nalmefene, naloxone), SSRIs (fluvoxamine, citalopram, escitalopram, fluoxetine), glutamatergic agents (topiramate, N-acetylcysteine), atypical antidepressants (bupropion, nefazodone), ADHD medications (atomoxetine, methylphenidate), semaglutide, β -caryophyllene, ecopipam, ketamine, and oxcabazepine. Opioid antagonist reduces craving and block rewards reduce obsessive features; Bupropion helps ADHD and improve reward dysregulation while Topiramate again reduces craving by affecting glutamatergic system. Substantial heterogeneity existed across studies regarding:

- diagnostic definitions,
 - study methodology,
 - sample size,
 - intervention duration,
 - outcome measures,
 - and severity of behavioral addiction symptoms.
- Because of this methodological heterogeneity, quantitative meta-analysis was not feasible, and findings were synthesized narratively.

GENERATIVE AI was used to create the figures and helping prepare final draft of study.

Data synthesis

A qualitative synthesis of the included studies was performed. Categorization was based on

1. Controlled Trials and Observational studies in various behavioral addictions
2. Isolated case studies and case series

RESULTS

The literature search identified 104 potentially relevant records from PubMed/MEDLINE. After screening titles and abstracts, 62 records were excluded because they were duplicates, non-pharmacological studies, review articles, editorials, unrelated psychiatric conditions, or did not meet the study objective. The remaining 42 articles underwent detailed eligibility assessment. Following full-text review, 18 articles were excluded because they consisted of narrative reviews/meta-analyses, incomplete or ongoing studies, or studies lacking clinically relevant pharmacological outcomes. Finally, 24 studies were included in the qualitative narrative synthesis. (Refer to Fig. 1 and 2)

Gambling Disorder

Among all behavioural addictions, gambling disorder demonstrated the strongest pharmacological evidence base. Multiple controlled studies reported reductions in gambling urges, gambling severity, impulsivity, and relapse vulnerability with opioid antagonists, particularly naltrexone. Topiramate combined with cognitive restructuring also demonstrated improvement in gambling severity and impulsivity in randomized settings. However, evidence for serotonergic and glutamatergic agents remained inconsistent. Emerging agents such as ketamine and oxcabazepine were supported only by isolated case-level evidence.^[13-17]

Internet Gaming Disorder and Internet Addiction

The most consistent evidence in internet gaming disorder was observed with bupropion, particularly in individuals with co-occurring depressive symptoms and impulsivity. ADHD medications such as atomoxetine and methylphenidate also demonstrated reduction in gaming severity among adolescents with comorbid ADHD. Evidence for N-acetylcysteine and other agents remained preliminary and largely restricted to isolated reports.^[18-21]

Compulsive Buying-Shopping Disorder

Evidence for compulsive buying-shopping disorder remained heterogeneous and inconsistent. SSRIs, particularly fluvoxamine and citalopram, demonstrated mixed results across open-label and placebo-controlled studies. Some studies suggested symptomatic improvement, whereas others failed to demonstrate superiority over placebo. Topiramate showed preliminary positive findings in randomized studies, but evidence remained limited. Most additional pharmacological evidence derived from isolated case reports.^[22-27]

Compulsive Sexual Behavior Disorder and Problematic Pornography Use

Pharmacological studies in compulsive sexual behaviour disorder were predominantly small, heterogeneous, and frequently uncontrolled. SSRIs and opioid antagonists represented the most frequently studied interventions. Several reports described reductions in compulsive sexual urges, pornography-related craving, and repetitive sexual behaviours with fluoxetine, citalopram, naltrexone, and nalmefene. However, most studies consisted of retrospective designs, case series, or isolated case reports.^[28-34]

Food Addiction:

Evidence for food addiction pharmacotherapy remained limited and conceptually heterogeneous. Semaglutide and β -caryophyllene demonstrated preliminary reductions in food addiction-related behaviours in obesity-related populations. Experimental opioid antagonist studies suggested

modulation of neural reward responses associated with compulsive eating behaviour. However, no

validated disorder-specific pharmacotherapy currently exists for food addiction.^{[35][36]}

Table 1. Controlled Trials and Observational Studies Included in Narrative Synthesis (n = 15)

Author (Year)	Behavioral Addiction	Study design	Sample Size	Pharmacological Intervention	Comparator /control	Main outcome
Kim et al. (2001);	Gambling Disorder	Double-blind placebo-controlled trial	45	Naltrexone	Placebo	Significant reduction in gambling urges and severity(75% vs 24%)
Castrén et al. (2019)	Gambling Disorder	Pilot feasibility study	20	Intranasal naloxone	None	Reduced gambling with acceptable feasibility.
de Brito et al. (2017)	Gambling Disorder	Randomis-ed double-blind trial	30	Topiramate	Placebo + therapy	Improvement in gambling severity and impulsivity
Song et al. (2016)	Internet Gaming Disorder	Comparative study	30	Bupropion	Escitalopr a m	Greater reduction in gaming symptoms and impulsivity
Park et al. (2016)	Internet Gaming Disorder	Comparative clinical study	86	Atomoxetin e and Methylpheni date	Comparati v e groups	Reduced gaming Severity and ADHD symptoms.
Black et al. (1997)	Compulsive Buying Disorder	Open-label study	10	Fluvoxamin e	None	Preliminary symptom improved in 9 pts.
Ninan et al. (2000)	Compulsive Buying Disorder	Placebo-controlled trial	37	Fluvoxamin e	Placebo	No significant superiority over placebo.
Black et al. (2000)	Compulsive Buying Disorder	Double-blind Placebo-controlled trial	23	Fluvoxamin e	Placebo	Mixed findings.
Koran et al. (2003)	Compulsive Shopping Disorder	Open-label + discontinu ation	24	Citalopram	Discontin u ation phase	Reduction in compulsive shopping severity.
Koran et al. (2007)	Compulsive Buying Disorder	Double-blind discontinu	26	Escitalopra m	Placebo discontinu ation	Preliminary benefit with inconsistent relapse
Nicoli de Mattos et al. (2020)	Compulsive Buying Disorder	Randomiz ed placebo-controlled trial	50	Topiramate	Placebo	Trend to improvement in compulsive buying behavior.
Coleman et al. (2000)	Compulsive sexual behavior disorder	Retrospect ive study	19	Citalopram	None	Reduction in compulsive sexual behaviors
Wainberg et al. (2006)	Compulsive sexual behavior disorder	Double-blind placebo-controlled trial	28	nefazodone	Placebo	Reduction in compulsive sexual behaviors
Nicolau et al. (2024)	Food Addiction	Observational study	84	Semaglutide	Comparati v e obesity groups	Reduction in food addiction-related behaviors

Alizadeh et al(2022)	Food Addiction	Double-blind placebo-controlled trial	52	Beta-caryophyllene	Placebo	Significant reduction in food addiction scale scores ^[37]
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Table 2. Isolated Case Reports, Case Series, and Ancillary Clinical Evidence Included in Narrative Synthesis (n= 9)

Author (Year)	Behavioral Addiction	Study Type	Pharmacological Intervention	Main Clinical Observation
Grant & Chamberlain (2020)	Gambling disorder	Case report	Intravenous ketamine	Rapid reduction in gambling urges
Lin et al. (2020)	Gambling disorder	Case report	Oxcarbazepine	Improvement in gambling behavior
Singh et al. (2022)	Internet gaming disorder	Case report / review	N-acetylcysteine	Improvement in gaming addiction symptoms
Bai et al. (2023)	Online gambling / gaming disorder	Case report	Fluoxetine + risperidone	Improvement in online gambling symptoms
Marcinko & Karlović (2005)	Compulsive buying disorder	Case report	Fluvoxamine + CBT	Symptomatic improvement observed
Raymond et al. (2002)	Compulsive sexual behavior disorder	Case series	Naltrexone + SSRIs	Improvement in compulsive sexual urges
Capurso (2017)	Pornography addiction	Case report	Naltrexone	Reduced pornography addiction symptoms
Yazdi et al. (2020)	Internet pornography addiction	Case report / review	Nalmefene	Reduced problematic pornography use for 2 years
Sultana & Sahib Din (2022)	Compulsive sexual behavior disorder	Case report / review	Naltrexone	Improvement in compulsive sexual behavior

Table 3. Summary of Pharmacological Evidence across Behavioral Addictions

Behavioral Addiction	Most Frequently Studied Agents	Overall Evidence
Compulsive buying-shopping disorder	SSRIs, topiramate	Weak and inconsistent
Compulsive sexual behaviors disorder	SSRIs, naltrexone	Preliminary but promising
Gambling disorder	Naltrexone, nalmefene, topiramate	Strongest pharmacological evidence
Gaming disorder / internet addiction	Bupropion, ADHD medications	Moderate preliminary evidence
Food addiction	Semaglutide, opioid antagonists	Limited and emerging evidence

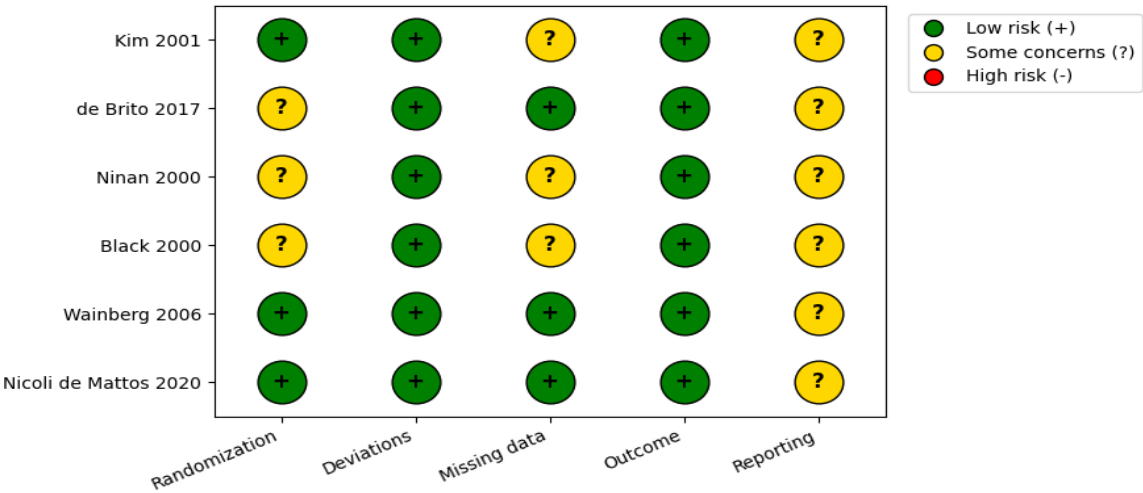
Overall Synthesis

Taken together, the available evidence suggests that pharmacotherapy may provide clinically meaningful benefit in selected behavioural addictions, particularly gambling disorder and internet gaming disorder. The strongest evidence currently supports opioid antagonists for gambling disorder, whereas bupropion and ADHD medications demonstrate promising findings in gaming disorder. Evidence for compulsive buying-shopping disorder, compulsive sexual behaviour disorder, and food addiction remains preliminary, inconsistent, and frequently limited by small sample sizes, uncontrolled methodology, and reliance on

isolated case reports. Some studies were discarded as they were without abstracts, involved psychotherapy only or were narrative review or meta-analyses^[38-44]

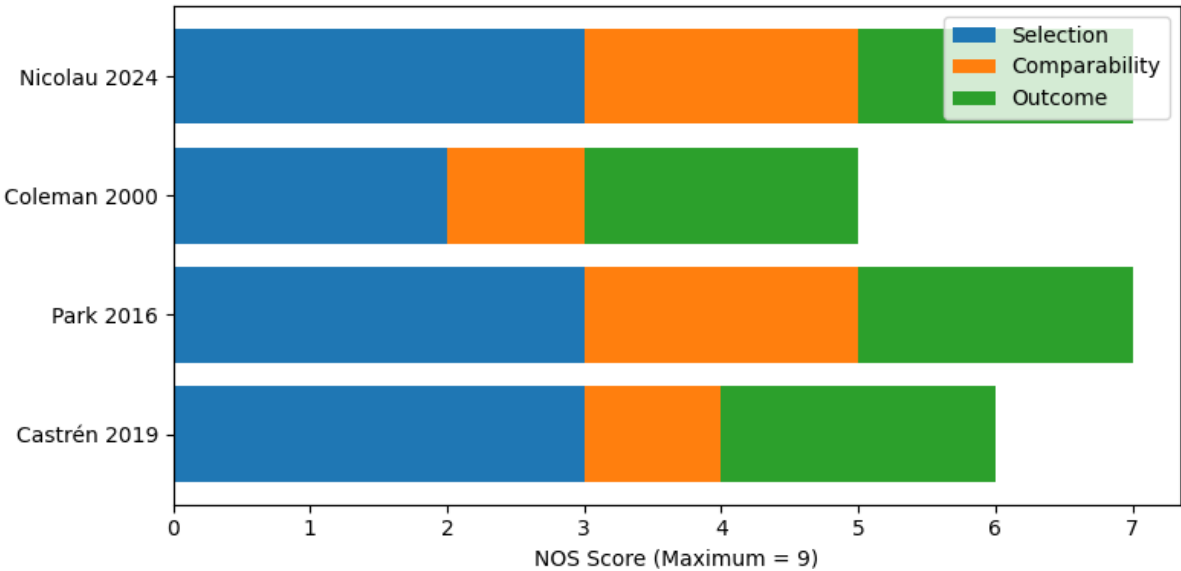
Several methodological constructs, nosological concerns and psychiatric comorbidities limited the certainty and reproducibility of findings. Consequently, pharmacotherapy stands as useful adjunctive interventions in severe, treatment-resistant, impulsive-compulsive, or craving-driven presentations. Traffic light plot was used to evaluate RCTs by Rob 2 tool^[45] (Fig 2):

Figure 2. Cochrane RoB 2 Traffic-Light Plot



Newcastle-Ottawa Scale^[46] was used for evaluating observational studies (Fig 3):

Figure 3. Newcastle-Ottawa Scale (NOS) Assessment



The overall certainty of evidence was evaluated using the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach^[47], considering:
Risk of bias, Inconsistency, Indirectness,

Imprecision and Publication bias
Certainty ratings were assigned by consensus among the three reviewers. This has been shown in next figure (Fig 4)

Table 4: GRADE approach for certainty of evidence

Behavioural Addiction	Principal Pharmacological Agents	Nature of Evidence	Major Limitations	Overall Certainty of Evidence (GRADE)
Gambling disorder	Naltrexone, nalmefene, topiramate	Multiple RCTs, placebo-controlled trials, pooled analyses	Small sample sizes, heterogeneity, short follow-up	Moderate
Gaming disorder /	Bupropion, atomoxetine,	Comparative studies, observational evidence, limited RCT-level data	Small samples, comorbid ADHD/depression, limited replication	Low–Moderate

internet addiction	methylphenidate			
Compulsive buying-shopping disorder	SSRIs, topiramate	Small RCTs, open-label studies, discontinuation trials	Inconsistent findings, attrition, heterogeneity	Low
Compulsive sexual behaviour disorder	SSRIs, naltrexone	Small placebo-controlled trials, retrospective studies, case series	Predominantly uncontrolled evidence, small samples	Low
Food addiction	Semaglutide, opioid-related agents	Observational studies, indirect neurobiological evidence	Conceptual heterogeneity, absence of validated diagnostic framework	Very Low

Summary

Across the included literature, the strongest methodological evidence was observed in gambling disorder, where multiple randomized placebo-controlled trials supported the role of opioid antagonists, particularly naltrexone, in reducing gambling urges and behavioural severity.

Internet gaming disorder demonstrated preliminary but clinically relevant evidence for bupropion and ADHD medications, especially in patients with co-occurring depressive symptoms or attentional dysregulation.

In contrast, evidence for compulsive buying-shopping disorder and compulsive sexual behaviour disorder remained substantially more heterogeneous. Positive findings were frequently derived from small open-label studies, retrospective analyses, or isolated case reports, limiting methodological robustness and reproducibility. Food addiction studies similarly remained preliminary and conceptually heterogeneous, without any established disorder-specific pharmacotherapy. The most consistent methodological limitation across studies was substantial clinical and diagnostic heterogeneity. Variability in behavioural addiction definitions, comorbid psychiatric conditions, intervention protocols, outcome measures, and duration of follow-up reduced cross-study comparability and limited certainty of evidence. Additionally, many studies were limited by small sample sizes, open-label methodology, and publication bias favoring positive findings.

Clinical Recommendations

For clinical practice, a cautious and individualized approach is recommended.

1. Establish careful diagnostic formulation before initiating medication.
2. Rule out primary psychiatric disorders such as bipolar disorder, OCD, ADHD, depression, anxiety disorders, or substance use disorders.
3. Psychotherapy, particularly CBT, should remain first-line treatment across behavioral addictions.

4. Pharmacotherapy should generally be reserved for:
 - severe craving,
 - impulsive-compulsive symptoms,
 - significant psychiatric comorbidity,
 - relapse despite psychotherapy,
 - or severe functional impairment.
5. Gambling disorder currently has the strongest pharmacological evidence base, particularly for opioid antagonists.
6. In gaming disorder, medication use is most justified when ADHD or depressive symptoms coexist.
7. For compulsive sexual behavior disorder, SSRIs and naltrexone may be considered in selected patients.
8. Pharmacotherapy for compulsive shopping and food addiction should remain highly individualized because evidence remains limited.

Limitations

Several limitations affect the interpretation of this review.

1. Significant heterogeneity existed across included studies regarding diagnostic criteria, interventions, study design, and outcome measures.
2. Many studies were limited by small sample sizes and open-label methodology. Some studies used combine pharmacotherapy and psychotherapy
3. Several behavioral addictions remain diagnostically controversial, limiting cross-study comparability.
4. Publication bias may favor positive pharmacological findings.
5. Formal meta-analysis was not feasible because of heterogeneity.
6. Much of the available evidence focused on symptom reduction rather than long-term functional outcomes.
7. Several studies involved substantial psychiatric comorbidity, making it difficult to determine whether improvements reflected reduction of

behavioral addiction symptoms or treatment of co-occurring psychiatric conditions.

8. The literature search was limited to PubMed/MEDLINE and may have missed relevant studies indexed in other databases such as Embase, PsycINFO, or Cochrane Library

CONCLUSION AND FUTURE DIRECTION

Among behavioral addictions, gambling disorder possesses the strongest pharmacological evidence base, particularly for opioid antagonists. Preliminary but clinically relevant evidence also exists for SSRIs and naltrexone in compulsive sexual behavior disorder and for bupropion in gaming disorder.

However, evidence for compulsive buying-shopping disorder and food addiction remains limited and inconsistent. Larger, methodologically rigorous randomized controlled trials using standardized diagnostic frameworks and longer follow-up periods are required.

Future research should focus on improved diagnostic clarification, separation of primary behavioral addiction symptoms from comorbid psychopathology, biomarker-informed treatment approaches, double blind RCTs with more subjects and long-term follow-up and development of individualized pharmacotherapeutic strategies

Conflict of Interest: None

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