



Review

Early maladaptive schemas and behavioural addictions: A systematic literature review

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ARTICLE INFO

Keywords:

Early maladaptive schemas
Behavioural addictions
Addiction
Social media
Gambling
Gaming

ABSTRACT

As observed in other mental health difficulties, behavioural addiction is a complex construct with several potential predisposing factors, which include biological factors (e.g., genetic predispositions), psychological factors (e.g., personality traits), and social factors (e.g., family, and social history). One factor that may play a significant role in both developing and perpetuating behavioural addiction is the activation of early maladaptive schemas (EMSs). The aim of the present review was to synthesize the evidence concerning the relationship between behavioural addiction and EMSs. A comprehensive literature search using keywords and subject headings was performed with three electronic databases, resulting in 20 studies that met the inclusion criteria. In relation to specific behavioural addiction, the 20 studies examined: binge-eating/food addiction ($n = 6$), sexual addiction/compulsive sexual behaviours ($n = 3$), multiple addictive behaviours ($n = 2$), internet addiction ($n = 2$), smartphone addiction ($n = 2$), social networking/Facebook addiction ($n = 2$), exercise dependence ($n = 1$), gambling ($n = 1$), and videogame addiction ($n = 1$). The patterns of association between EMS and behavioural addiction were examined in both clinical and non-clinical population. The 'Disconnection and Rejection' domain was the most strongly related schema domain across all addictive behaviours, followed by 'Impaired Limits'. The present review suggests a positive relationship between schema activation and several addictive behaviours, including addictions to gambling, gaming, social media use sex, exercise, and food. The clinical implications of the findings are discussed, but further research is needed to inform treatment plans and interventions for those who struggle with behavioural addictions.

1. Introduction

In conjunction with the already defined addictions such as opioid use disorder and alcohol use disorder, the chapter 'Substance-Related and Addictive Disorders' of the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) included gambling as an addictive disorder. This change reflected the evidence that gambling activates neural pathways and leads to problematic behaviours similar to those observed in substance misuse disorders. Internet gaming disorder was also included as a tentative disorder and a behavioural addiction. Other potentially addictive behaviours, such as sex addiction, exercise addiction, or shopping addiction, were not included due to "insufficient peer-reviewed evidence to establish the diagnostic criteria" (American Psychiatric Association, 2013, p. 481).

Despite the debate around the concept, behavioural addiction is currently understood as a set of behaviours often characterized by both compulsivity and impulsivity, causing significant distress and lead to negative outcomes across different aspects of an individual's life, including social relationships, occupation and/or education, and leisure activities. Potenza (2006) highlights the core element of addictions as a craving state before behavioural activation, impaired control over the behaviour, and continued behavioural engagement despite negative outcomes. On the other hand, Griffiths (1996, 2005) proposes there are sex core components of behavioural addiction: (i) salience – when a particular activity becomes the centre of the person's life, with a significant impact on their thinking, feeling, and behaviour; (ii) mood modification – the consequence of engaging in the particular activity, often seen as a coping strategy; (iii) tolerance – an escalation in

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<https://doi.org/10.1016/j.cpr.2023.102340>

Received 13 April 2023; Received in revised form 6 September 2023; Accepted 22 September 2023

Available online 25 September 2023

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engagement with the problematic behaviour to achieve satisfaction; (iv) *withdrawal symptoms* – negative and unpleasant physical and emotional states associated to the activity, such as irritability and moodiness; (v) *conflict* – the addictive behaviour is often associated with both interpersonal (compromising relationships, education and/or occupation) and intrapsychic conflicts (e.g., subjective loss of control), and (vi) *relapse* – the vulnerability to revert to early patterns of the addictive behaviour after a period of abstinence.

As observed in other mental health difficulties, behavioural addiction is a complex construct with several potential predisposing factors, which include biological factors (e.g., genetic predispositions), psychological factors (e.g., personality traits), and social factors (e.g., family, and social history) (Brand et al., 2019; Kotyuk et al., 2019; Mehroof & Griffiths, 2010). Literature suggests a high rate of comorbidity between poor mental health and addiction, with individuals with existing substance misuse being at risk of developing behavioural addiction (Cowlshaw, Merkouris, Chapman, & Radermacher, 2014; Lorains, Cowlshaw, & Thomas, 2011; Potenza, 2006; Starcevic & Khazaal, 2017). Personality traits such as impulsivity and vulnerability to risk-taking are also thought to be risk factors for developing behavioural addiction (Grant, Potenza, Weinstein, & Gorelick, 2010).

With regards to adult gambling, Calado and Griffiths (2016) reviewed all the empirical research and reported variations in problem gambling rates across different countries of the world (0.12–5.8%) and 0.12 to 3.4% in Europe. Calado, Alexandre, and Griffiths (2017) and Montiel, Ortega-Barón, Basterra-González, González-Cabrera, and Machimbarrena (2021) both reported a worldwide prevalence of 4.6% for gambling disorders among young people aged between 11 and 16 years.

A meta-analysis conducted by Maraz, Griffiths, and Demetrovics (2016) estimated that the prevalence of compulsive buying behaviour in representative studies of adults was approximately 5%. Other meta-analyses (Cheng, Lau, Chan, & Luk, 2021; Meng et al., 2022) have also attempted to estimate the global pooled prevalence of various addictive behaviours and have reported 17.4% for social media addiction, 27% for smartphone addiction, 14.2% for internet addiction, 6% for gaming addiction, 8.2% for cybersex addiction. In relation to gaming addiction, a review conducted by Kim et al. (2022), with data extracted from 61 studies and including 227,665 participants across 29 countries, estimated a pooled prevalence of 3.3%. These findings were consistent with two previous meta-analyses. Stevens, Dorstyn, Delfabbro, and King (2021) reviewed data from 53 studies comprising 226,247 participants across 17 different countries and estimated a worldwide prevalence of gaming disorder of 3.05%. However, the estimated prevalence was reduced to 1.96% when including only studies that met more rigorous sampling criteria. Fam (2018) reviewed data from 16 studies comprising 61,737 adolescents and estimated the prevalence rate of internet gaming disorder to be 4.6%, with male adolescents reporting higher prevalence rates (6.8%) compared to female (1.3%). Similarly, Stevens et al. also reported a ratio of GD to be 2.5 times higher among males than females.

Finally, systematic literature review and meta-analysis conducted by Alimoradi, Lotfi, Lin, Griffiths, and Pakpour (2022) attempted to estimate the prevalence of behavioural addiction during COVID-19 pandemic. Using a total of 94 studies with 237,657 participants from 40 different countries, the authors estimated an overall prevalence of behavioural addiction of 11.1%. With regards to specific addictive behaviours, the prevalence rates were 10.6% for internet addiction, 30.7% for smartphone addiction, 5.3% for gaming addiction, 15.1% for social media addiction, 21% for food addiction, 9.4% for sex addiction, 7% for exercise addiction, 7.2% for gambling addiction, and 7.2% for shopping addiction.

Whether it is addictions to food, gambling, internet, social media, exercise, work, or pornography, all these behaviours are associated with a pattern of emotional dysregulation and cognitive distortions, where the person often experiences difficulties in managing their feelings and fail to exercise control and mastery over their actions. These behaviours

are also often associated with poor self-image and negative emotional experiences, with the problematic behaviours being used as an escape and a (maladaptive) self-soothing strategy (Zeock, Stelzer, Linster, Joos, & Hartmann, 2011). Several studies have also suggested a poor quality of life among individuals with behavioural addiction due to the association with physical health problems, social and relationship difficulties, and mental health disorders (Hoseinifar et al., 2011; Lu et al., 2018; Wang et al., 2019).

1.1. Early maladaptive schemas

One factor that may play a significant role in both developing and perpetuating behavioural addiction is the activation of early maladaptive schemas (EMSs). According to the schema therapy model, psychological distress and emotional pain may be connected to early maladaptive schemas which are developed as a response to unmet core emotional needs from childhood (Young, Klosko, & Weishaar, 2003).

EMSs are defined as “*extremely stable and enduring themes, comprised of memories, emotions, cognitions, and bodily sensations regarding oneself and one's relationship with others, that develop during childhood and are elaborated on throughout the individual's lifetime, and that are dysfunctional to a significant degree*” (Young et al., 2003, p.7). EMSs incorporate beliefs, views, and expectations about self, others, and the world. They operate outside awareness, inform relationships, and help to make sense of emotional experiences (Young and Brown (2003)). Another characteristic of early maladaptive schemas is that they are only activated by situations relevant to the specific schema, which in turn lead to negative emotional experiences, relationship problems, psychological distress, and mental health disorders (Barazandeh, Kissane, Saeedi, & Gordon, 2016; Flink et al., 2018; Kunst, Lobbstaël, Candel, & Batink, 2020). Young & Brown, 2003 proposes that the 18 early maladaptive schemas are distributed across five domains: (i) *Disconnection and Rejection* – domain associated with insecure attachment and lack of stability in interpersonal relationships; (ii) *Impaired Autonomy and Performance* – domain associated with lack of sense of self and autonomy; (iii) *Impaired Limits* – domain associated with difficulties in setting both personal and interpersonal limits; (iv) *Other Directedness* – domain associated with excessive preoccupation about the reactions, opinions, and approval of others; and (v) *Over-Vigilance and Inhibition* – domain associated with internalized rigid rules and moral values as well as suppression of emotional experiences. Table 1 outlines each of the schema domains and individual early maladaptive schemas.

More recently, as a result of factor analysis, four domains of the higher-order schema were identified as more adequate in respect of interpretability and empirical indices: (i) *Disconnection & Rejection*; (ii) *Impaired Autonomy & Performance*; (iii) *Excessive Responsibility & Standards*, and (iv) *Impaired Limits* (Bach, Lockwood, & Young, 2018). Despite these recent advances, most studies included in this review are informed by the five-domain model of schemas detailed in Table 1.

Numerous studies have found positive associations between early maladaptive schemas and personality disorders (Dadomo, Panzeri, Caponcello, Carmelita, & Grecucci, 2018; Sempértegui, Karreman, Arntz, & Bekker, 2013) as well as other mental health difficulties (Aloi et al., 2020; Basile, Tenore, Luppino, & Mancini, 2017). In addition, there have been a growing number of research studies examining the relationship between schemas and substance-use disorders (although to date, there have been no reviews). In one study (Shorey, Anderson, & Stuart, 2012a, 2012b) which examined the relationship between opioid use and early maladaptive schemas among 169 young adults, the schemas scored most often as high or very high among female participants were insufficient self-control, self-sacrifice, abandonment, and mistrust/abuse. In contrast, male participants scored high or very high on the schemas of insufficient self-control, punitiveness, unrelenting standards, and self-sacrifice. However, McDonnell, Hevey, McCauley, and Ducray (2018) found a positive association between opioid dependence and the EMSs of mistrust/abuse, emotional deprivation,

Table 1
Schema domains and early maladaptive schemas (Young & Brown, 2003).

Schema domain	Early maladaptive schemas	Features
Disconnection and Rejection	<ul style="list-style-type: none"> Abandonment / Instability Mistrust / Abuse Emotional Deprivation Social Isolation / Alienation Defectiveness / Shame Dependence / Incompetence 	Insecure attachment and lack of stability in interpersonal relationships
Impaired Autonomy and Performance	<ul style="list-style-type: none"> Vulnerability to Harm or Illness Enmeshment / Underdeveloped Self Failure Entitlement / Grandiosity 	Lack of sense of self and autonomy
Impaired Limits	<ul style="list-style-type: none"> Insufficient Self-Control / Self-Discipline 	Difficulties with setting both personal and interpersonal limits
Other Directedness	<ul style="list-style-type: none"> Subjugation Self-Sacrifice 	Excessive preoccupation with the reactions, opinions, and approval of others
Over-Vigilance and Inhibition	<ul style="list-style-type: none"> Emotional Inhibition Unrelenting Standards / Hypercriticalness 	Internalized rigid rules and moral values as well as suppression of emotional experiences

defectiveness/shame, vulnerability, subjugation, and pessimism.

With regards to alcohol use, Shorey, Anderson, and Stuart (2012a, 2012b) found that the four EMSs rated most often as high or very high for males were self-sacrifice, unrelenting standards, punitiveness, and insufficient self-control, whereas among females the EMSs of self-sacrifice, unrelenting standards, insufficient self-control, and punitiveness received the higher scores. In addition, Shorey, Stuart, and Anderson (2013) compared the early maladaptive schemas among females with opioid dependence and females with alcohol dependence diagnosis. The findings suggested that females with an opioid dependence diagnosis had higher scores on the EMSs punitiveness and dependence when compared to women with alcohol dependence diagnosis, with the latter reporting high or very high on the EMSs of negativity/pessimism, unrelenting standards, and insufficient self-control. Finally, a study conducted in Morocco (Idrissi et al., 2018) examining EMSs among heroin addicts undergoing methadone treatment found that the EMSs that scored highest during the activation period were fear of losing control, unrelenting standards, vulnerability, and emotional deprivation. However, the most activated EMSs during the treatment period were failure, mistrust/abuse, and fear of losing control.

Despite the growing number of studies investigating the relationship between EMSs and substance misuse, few have investigated the relationship with behavioural addiction. Therefore, the present review aimed to synthesize the literature related to the relationship between early maladaptive schemas and behavioural addiction.

2. Method

2.1. Data sources and strategy

The review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendations (Moher et al., 2015). The literature search was conducted February 6–10, 2023, and involved reviewing electronic databases and bibliographic references of retrieved papers. A comprehensive literature search of English language papers in the *OneSearch* (the authors' university search engine which include many databases including *PubMed*) *Scopus*, and *ProQuest* was conducted. The present review was pre-

registered with PROSPERO in February 2023.

Reference lists from each study found in the database were also evaluated until no new studies could be found. A combination of the following terms was used to search each database: ("maladaptive schemas" OR schem*) AND (behav* OR disorder* OR addict* OR compuls* OR impuls* OR depend* OR problem* OR obsess* OR excess* OR internet OR sex* OR porn* OR pornography OR "social media" OR smartphone OR "mobile phone" OR "cell phone" OR gambling OR gambl* OR betting OR "video gam*" OR "social network*" OR Twitter OR Instagram OR YouTube OR Facebook OR WhatsApp OR TikTok OR Snapchat OR Tinder OR exercis* OR "physical activity" OR food OR "being eating" OR shopping OR buying).

2.2. Inclusion and exclusion criteria

Papers were reviewed for meeting the following inclusion criteria. The studies: (i) assessed the relationship between EMSs (Young et al., 2003) and addictive behaviours (including sex addiction / compulsive sexual behaviour, binge eating / food addiction, internet addiction, exercise dependence, smartphone addiction, gambling addiction, social network addiction, problematic video gaming, and multiple addictive behaviours); (ii) were published in English and in a peer-reviewed journal; and (iii) contained empirical primary data. Publications were not excluded based on research design (i.e., experimental) or target population (i.e., clinical, or non-clinical; male or female). The exclusion criteria were studies: (1) not published in English; (2) where the output was a review paper, conference abstract, poster paper, letter, commentary, or editorial; (3) that primarily concerned substance addiction and its derivatives (e.g., alcohol); and (4) that primarily concerned sexual offending behaviour.

2.3. Study selection and data extraction

Paper selection initially resulted in 245 papers from *OneSearch*, 211 papers from *Scopus*, and 238 papers from *ProQuest*. Titles and abstracts of all search results were reviewed for inclusion. If a paper was deemed potentially relevant, full-text copies were attained and compared against the eligibility criteria. The search resulted in 20 studies meeting the inclusion criteria. The following data was extracted from the 20 studies: sample characteristics (e.g., size, gender, location), type of addictive behaviour assessed (e.g., internet addiction, gambling addiction), measures (i.e., screening instruments used), and key findings. Study selection was carried out by the first author and then all selected studies were shared with a second member of the research team to discuss whether the study should be included in the review based on the inclusion/exclusion criteria.

2.4. Quality assessment of included studies

The methodological quality of the full-text studies was assessed using the Newcastle-Ottawa Quality Assessment Scale, adapted for Cross-Sectional studies. The first author rated the methodological quality criteria individually and these were discussed and agreed upon with the other authors. The authors used a modified Newcastle-Ottawa Quality Assessment scale adapted for cross-sectional studies, which consisted of seven criteria to assess quality (Table 1). For five criteria, a score of 1 was endorsed for fully meeting the criterion, and a score of 0 for not meeting the criterion. For the remaining two criteria, a score of 2 was endorsed for fully meeting the criterion, a score of 1 for partly meeting the criterion, and 0 for not meeting the criterion. The methodological quality score was calculated for each study by summing the total score of all relevant criteria and dividing it by the total possible score.

Following best practice guides (Siddaway, Wood, & Hedges, 2019), the present review went through several stages to guarantee a high-quality review. These stages were: (i) formulating research questions, (ii) identifying relevant literature, (iii) assessing literature eligibility,

(iv) analysing eligible literature, and (v) reporting the results of the review.

3. Results

The search of electronic databases identified a total of 694 papers, with 343 remaining after removing duplicates. Following the initial screening against the inclusion criteria, 32 papers proceeded to full-text review. After a full-text review, seven papers were excluded. A final total of 20 papers were subsequently included in the review. A PRISMA flowchart of the search strategy, depicting the selection of papers, is presented in Fig. 1.

3.1. Quality assessment

With a possible maximum score of 9, 15 studies had a total score of 6, one study had a total score of 5, and the remaining four studies had a total score of 7. Studies with a score higher than 6 were deemed high-quality papers. The authors used a modified version from the Newcastle-Ottawa Assessment scale for cohort studies to perform a quality assessment of cross-sectional studies (Modesti et al., 2016a, 2016b). Table 2 provides the details of the quality assessment for included studies.

3.2. Overview of included studies

Table 3 provides an overview of included studies. All studies were published over the past 17 years, with the majority being over the last five years ($n = 16$). The total number of participants across all studies was 13,932, comprising both male and female participants (5932 males and 8000 females) from both clinical and non-clinical settings. In relation to specific behavioural addiction, the 20 studies examined: binge-eating/food addiction ($n = 6$), sexual addiction/compulsive sexual behaviours ($n = 3$), multiple addictive behaviours ($n = 2$), internet addiction ($n = 2$), smartphone addiction ($n = 2$), social networking/Facebook addiction ($n = 2$), exercise dependence ($n = 1$), gambling ($n = 1$), and videogame addiction ($n = 1$).

3.3. Location of studies

Most of the studies in the present review were conducted in Iran ($n = 4$) and Italy ($n = 4$). Other countries included US ($n = 2$), Australia ($n = 2$), Israel ($n = 2$), Turkey ($n = 2$), Poland ($n = 2$), Brazil ($n = 1$), and China ($n = 1$).

3.4. Design

Most studies were cross-sectional ($n = 18$), with two case-control studies. No randomised control trials were identified.

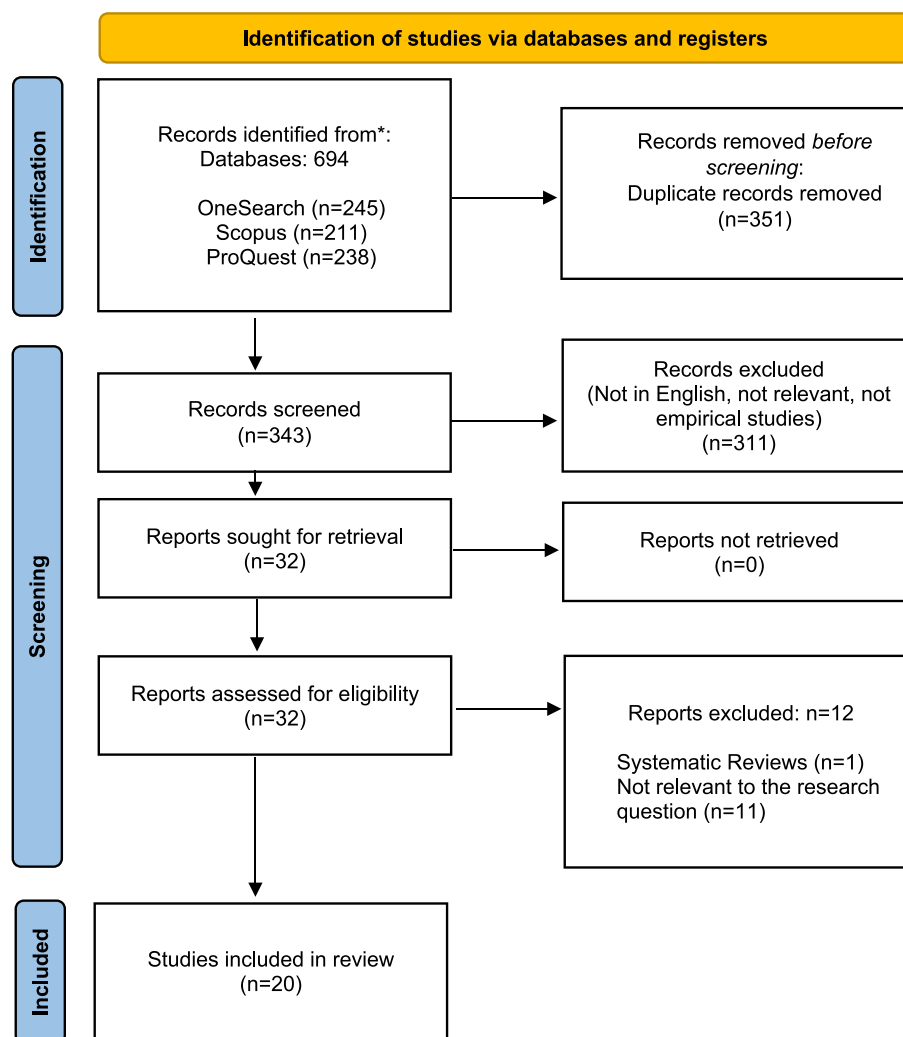


Fig. 1. PRISMA flowchart of study selection process. Based on guidelines by Page et al. (2021).

Table 2
Quality assessment of included studies ($n = 20$) using a modified version of the Newcastle-Ottawa Assessment Scale.

Authors	Design	Quality Assessment							
		Representativeness	Sample Size	Non-Respondents	Ascertainment of Exposure	Design & Analysis	Assessment of the Outcome	Statistical Test	Decision
		1 - Representative & Random Sampling 0 - Not representative	1 - > 100 0 - < 100	1 – Satisfactory 0 - Not satisfactory	2 - Validated Tools 1 - Only through recalls 0 - Not detailed	1 - Control for key factors 0 - No control group	2 - Independent Lab assessment 1 - Self Reports	1 - Appropriate Test used 0 - Not appropriate test	
Azemat, Mohammadian, Abaid, and Mohammadkhani (2016)	Case Control	0	0	1	2	1	1	1	6
Aloi et al., 2020, Aloi et al. (2020)	Cross-Sectional	0	1	1	2	0	1	1	6
Aloi, Rania, et al., 2020, Aloi, Verrastro, et al. (2020)	Cross-Sectional	0	1	1	2	1	1	1	7
Anderson, Rieger, and Caterson (2006)	Cross-Sectional	0	0	1	2	1	1	1	6
Arpaci (2021)	Cross-Sectional	0	1	1	2	0	1	1	6
Arpaci (2022)	Cross-Sectional	0	1	1	2	0	1	1	6
Basile, Tenore, and Mancini (2019)	Cross-Sectional	0	0	1	2	1	1	1	6
Cudo, Maçik, Griffiths, & Kuss, 2020, Cudo, Torój, Misiuro, and Griffiths (2020)	Cross-Sectional	0	1	1	2	0	1	1	6
Cudo, Dobosz, Griffiths, and Kuss (2022)	Cross-Sectional	0	1	1	2	0	1	1	6
Efrati, Shukron, and Epstein (2021)	Cross-Sectional	0	0	1	2	1	1	1	6
Efrati, Kolubinski, Marino, and Spada (2022)	Cross-Sectional	0	1	1	2	0	1	1	6
Elmqvist, Shorey, Anderson, and Stuart (2016)	Cross-Sectional	0	1	1	2	1	1	1	7
Imperator et al. (2017)	Cross-Sectional	0	0	1	2	0	1	1	5
Kahouei et al. (2020)	Cross-Sectional	0	1	1	2	0	1	1	6
da Luz et al. (2017)	Case Control	0	1	1	2	1	1	1	7
Ostovar, Bagheri, Griffiths, and Hashima (2021)	Cross-Sectional	0	1	1	2	0	1	1	6
Rankin, Read, Walker, and Rankin (2021)	Cross-Sectional	0	1	1	2	0	1	1	6
Shajari, Sohrabi, and Jomehri (2016)	Cross-Sectional	0	1	1	2	0	1	1	6
Shorey, Stuart, and Anderson (2012)	Cross-Sectional	0	1	1	2	1	1	1	7
Zhu et al. (2016)	Cross-Sectional	0	1	1	2	0	1	1	6

3.5. Sample

Sample sizes ranged from 60 to 2172 participants. Considering the heterogeneous nature of sample characteristics across populations (e.g., students, clinical and non-clinical settings), the generalisability of findings becomes limited. Most studies used non-clinical samples ($n = 13$) whereas the remaining studies used clinical samples ($n = 7$).

3.6. Measures

Overall, studies used a variety of measures to assess behavioural addiction and early maladaptive schemas. To assess early maladaptive schemas, all studies used the Young Schema Questionnaire (YSQ;

Schmidt, Joiner, Young, & Telch, 1995) or its derivatives (YSQ-L3; Young & Brown, 2005), with the Young Schema Questionnaire–Short Form Version 3 (YSQ–S3; Young & Brown, 2005) being the most common ($n = 10$). Most studies ($n = 12$) were informed by the original five-domain organization of schemas, as opposed to the four-domain model proposed by Bach et al. (2018).

A wide range of instruments were employed to assess the different types of behavioural addiction, such as the Sexual Addiction Screening Test-Revised (SAST-R; Carnes, Green, & Carnes, 2010) ($n = 2$) for compulsive sexual behaviour, the Binge Eating Scale (BES; Gormally, Black, Daston, & Rardin, 1982) ($n = 3$) and Yale Food Addiction Scale 2.0 (YFAS 2.0; Aloi et al., 2017) ($n = 2$) for food addiction and binge-eating, the South Oaks Gambling Screen (SOGS; Lesieur & Blume,

Table 3

– Overview of included studies ($n = 20$).

Addiction	Authors	Aims	Sample	Measures	Key Findings
Sex addiction	Azemat et al. (2016)	Examine and compare EMSs in male sexual addicts and normal participants	30 men with sexual addiction, and 30 normal men as the control group	Sexual Addiction Screening Test-Revised (SAST-R) Young schema questionnaire – Short-version (YSQ-S3)	The study results indicate that 5 schemas, including dependence/incompetence, mistrust/abuse, subjugation, vulnerability, and emotional deprivation are the best predictors of sexual addiction.
Compulsive sexual behaviour	Elmqvist et al. (2016)	To examine the relationship between EMSs and compulsive sexual behaviours in a sample of men and women in residential treatment for a substance-use dependence.	198 men and 62 women who were admitted to a residential substance use treatment center Patients' mean age was 41.4 years (SD = 10.36) and mean years of education was 13.88 (SD = 2.00)	Young schema questionnaire – Long Version (YSQ-L3) Sexual Addiction Screening Test-Revised (SAST-R) Alcohol Use Disorders Identification Test (AUDIT) Drug Use Disorders Identification Test (DUDIT)	Results demonstrated that the CSB and Non-CSB groups significantly differed on EMS domains, $F(5, 240) = 16.27, p < .001$. The CSB group scored significantly higher than the Non-CSB group on the domains of disconnection/rejection, impaired autonomy, and impaired limits.
Compulsive sexual behaviours	Efrati et al. (2021)	To explore the possible associations between compulsive sexual behaviours and cognitive distortions in the form of EMSs among two groups with sexual-related disorder: individuals who seek treatment for CSB [i.e., members of a Sexaholic Anonymous (SA) group] (Study 1) and sex offenders (in comparison to violence offenders; Study 2).	Study 1 – Participants Jewish Israeli members of a Sexaholic Anonymous (SA) who ranged in age from 18 to 61 years ($M = 32.26, SD = 14.98$). Study 2–103 sex offenders and 81 violent offenders	Individual-Based Compulsive Sexual Behaviour (I-CSB) Hypersexual Behaviour Inventory (HBI) Young Schema Questionnaire—Short Form-3 (YSQ—S3) Sensation Seeking and Impulsivity	Studies 1 and 2 indicated that EMSs are highly indicative of CSB severity among members of Sexaholic Anonymous (SA) groups—individuals with clinical levels of CSB—and among sex and violence offenders—individuals with subclinical levels of CSB. Individuals with higher CSB (subclinical and clinical) have impaired internal and interpersonal limits that might explain, on the one hand, the lack of behavioural control and the constant uncontrolled engagement with sexual fantasies, urges, and behaviours.
Binge eating	Anderson et al. (2006)	A comparison of maladaptive schemata in treatment-seeking obese adults and normal-weight control participants	91 participants Obese Group = 52 (14 men and 38 women) Control Group = 30 (10 men and 29 women)	The Questionnaire on Eating and Weight Patterns—Revised (QEWP-R) Young schema questionnaire – Short Version (YSQ—S) Binge Eating Scale (BES) The Profile of Mood States—Adolescents (POMS-A) Balanced Inventory of Desirable Responding (BIDR)	Results from the one-way ANOVA indicated that the obese group obtained a significantly higher total score on the YSQ-S as compared with the normal-weight control group [$F(1, 89) = 8.743, P = .004$] The results of the regression model indicated that obese status was significantly associated with the severity of maladaptive schemata ($P = .003$) after controlling for BED/subclinical BED status, age, and household income. A significant positive correlation of a large effect size was obtained between the YSQ-S and POMS-A scores within the obese group ($r = 0.607, P = .001$) and the control group ($r = 0.566, P = .001$). Within the obese group, a significant positive correlation of a medium effect size ($r = 0.487, P = .001$) was obtained between YSQ-S and BES scores. The association between YSQ-S and BES scores within the control group was not significant ($r = 0.172, P = .295$). There was no significant correlation between YSQ-S scores and BMI within the obese group ($r = 0.089, P = .531$). However, a significant positive correlation of a medium effect size ($r = 0.339, P = .035$) was obtained between YSQ-S scores and BMI within the control group.
Binge eating	da Luz et al. (2017)	To examine whether individuals with morbid obesity differed with regard to dysfunctional cognitions when compared to individuals of normal weight, when mental health status was controlled for	111 participants Morbid Obesity = 53 (41 women, 12 men). Normal Weight = 58 (45 women, 13 men).	Mini Mental State Examination (MMSE) Young Schema Questionnaire (YSQ) Cognitive Distortions Questionnaire (CD-Quest) Depression, Anxiety and Stress Scale (DASS-21)	Scores for the early maladaptive schema of insufficient self-control/self-discipline were significantly higher in participants with morbid obesity compared to participants of normal weight There were no other statistically significant differences between participants with morbid obesity and participants of normal weight with respect to scores on EMSs

(continued on next page)

Table 3 (continued)

Addiction	Authors	Aims	Sample	Measures	Key Findings
Binge eating	Basile et al. (2019)	To investigate maladaptive schemas, modes and dysfunctional coping strategies, and their association with dysfunctional eating behaviours (i.e., bingeing, purging) and other psychological variables, in overweight and obese individuals	Seventy-five Caucasian volunteers were recruited through an online survey Normal weight sample ($n = 37$), 45.9% female Overweight sample ($n = 48$), 54.1% female	Eating Disorder Inventory 3 (EDI-3) Centre for Epidemiological Studies – Depression Scale (CES–D) Young Schema Questionnaire – Short form (YSQ-SF) Young – Rygh Avoidance Inventory (YRAI) Young Compensation Inventory (YCI) Schema Mode Inventory (SMI)	Overweight and obese participants reported significantly more pervasive Abandonment ($t(83)/4-2.22, p < .05$), Dependency ($t(83)/4-2.82, p < .005$), Subjugation ($t(83)/4-2.54, p < .01$), and Insufficient self-control schemas ($t(83)/4-2.91, p < .005$) Among schema modes, the Vulnerable and Impulsive child and the Detached Protector coping mode ($t(83)/4-2.19, p < .05$), were higher, whereas the Happy child ($t(83)/4-2.55, p < .05$), and the Healthy adult ($t(83)/4-3.45, p < .001$), were stronger in the normal weight participants Binge frequency was positively associated with all maladaptive schemas and dysfunctional modes. Positive correlations between schemas, modes and copying styles were also observed in relation to bingeing, bulimic symptoms' severity, vomit frequency and an overall risk of developing an eating disorder. Frequency of bingeing was predicted by the Abandonment, Enmeshment/ undeveloped self and Failure schemas ($F(3,44)/438.84, p < .000, R^2/0.70$), by the Impulsive and Undisciplined child and the Punitive parent modes ($F(2,45)/431.38, p < .000, R^2/0.58$), and by the intra-psychoic avoidance coping ($F(1,46)/453.37, p < .000, R^2/0.53$). The partial correlations, controlling for gender, age and BMI, revealed that binge eating was positively and significantly correlated with life event stress, EMSs and impulsivity ($r = 0.29, r = 0.35$, and $r = 0.41$, respectively; $ps < 0.01$). These results suggest that students with greater life event stress, more EMSs and higher levels of impulsivity engaged in more severe binge eating.
Binge eating	Zhu et al. (2016)	To examine (1) how EMSs mediate the relationship between life event stress and binge eating and (2) how impulsivity might moderate these relationships	2172 middle and high school students, of whom 941 were boys (43.3%) and 1231 were girls (56.7%).	Adolescent Self-Rating Life Events Check List Binge-Eating Inventory (designed by the service) Young Schema Questionnaire-Short Form Revised Neuroticism-Extraversion-Openness Personality Inventory	The partial correlations, controlling for gender, age and BMI, revealed that binge eating was positively and significantly correlated with life event stress, EMSs and impulsivity ($r = 0.29, r = 0.35$, and $r = 0.41$, respectively; $ps < 0.01$). These results suggest that students with greater life event stress, more EMSs and higher levels of impulsivity engaged in more severe binge eating.
Binge eating	Aloi, Rania, et al., 2020, Aloi, Verrastro, et al. (2020)	To assess and compare obese women with and without BED in relation to personological facet sand EMSs. The second aim was to identify the variables among personality facets and EMSs associated with the severity of BED by means of linear regression.	100 female participants (55 with BED and 45 without BED)	Eating Disorder Examination Interview (EDE) Binge Eating Scale (BES) Beck Depressive Inventory (BDI-II) Personality Inventory for DSM-5 (PID-5) Young Schema Questionnaire Short Form-3 (YSQ-S3)	Obese BED patients showed significantly higher scores than their counterparts in the following EMSs: emotional deprivation, abandonment, social isolation, defectiveness/shame, dependence/incompetence, and insufficient self-control. The total BES score was associated with depressively of the PID-5 and emotional deprivation and defectiveness of the YSQ-S3
Food addiction	Imperatorii et al. (2017)	To assess, in overweight and obese women, (i) the association between dysfunctional eating patterns (i.e., FA and binge eating) and EMSs, and (ii) the association between FA and EMSs after controlling for potential confounding variables (e.g., binge eating severity and psychopathology)	70 overweight and obese women	Yale Food Addiction Scale (YFAS) Young Schema Questionnaire Long Form, Third Edition (YSQ-L3) Binge Eating Scale (BES) Hospital Anxiety and Depression Scale (HADS)	On the YSQ-L3, binge eating severity was positively associated with disconnection/rejection ($r = 0.41; p < .01$), impaired limits ($r = 0.26; p < .05$), and other-directedness domains ($r = 0.27; p < .05$). Binge eating symptoms were also significantly associated with depressive symptoms ($r = 0.38; p < .01$) and BMI ($r = 0.28; p < .05$).
Internet addiction	Ostovar et al. (2021)	To assess the role of EMSs in relation to internet addiction	714 participants (301 males and 413 females) from 19 provinces in Iran	Young Schema Questionnaire Short Form (YSQ-SF) Internet Addiction Scale (IAS)	The WarpPLS analysis supported the existence of statistically significant and positive relationships among two areas of EMSs ⊗i) disconnection/rejection domains (e.g., abandonment, mistrust/ abuse,

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Table 3 (continued)

Addiction	Authors	Aims	Sample	Measures	Key Findings
Internet addiction	Shajari et al. (2016)	To investigate the relationship between Early Maladaptive Schema and Internet Addiction among students	195 students, 45% of the participants were men and 55% were women	Generalized Pathological Internet Use Scale (GPIUS) Young Schema Questionnaire (YSQ)	social isolation, emotional deprivation, and defectiveness/shame areas) and (ii) impaired autonomy/performance schema domains (e.g., dependence/incompetence, vulnerability to harm and illness, enmeshment/undeveloped self and failure to achieve area) with internet addiction. Disconnection/rejection domains and impaired autonomy/performance had high prediction of the potential variance in IA. Pearson's correlation test was used to examine the relationship between each aspect of the early maladaptive schema and internet addiction. Error-level of each one of the fifteen aspects of the early maladaptive schema pertinent to the Internet schema was <0.05 and all the coefficients were positive In addition, the correlation level between "other directedness" and internet addiction was higher than that of other domains of the early maladaptive schema
Exercise dependence	Rankin et al. (2021)	To examine whether higher levels of early maladaptive schema (EMS) and negative implicit self-esteem were predictive of self-reported exercise dependent behaviour.	136 adult Australian cyclists The gender distribution of the current sample was 72% males and 28% females	Young Schema Questionnaire Short Form Revised (YSQ-S3) Exercise Dependence Scale Revised (EDS-21) Implicit Association Test for self-esteem (SE-IAT)	The linear regression model revealed that individuals' YSQ-S3 total scores predicted EXD, $R^2 = 0.26$, $F(1, 134) = 47.75$, $p < .001$, 95% CI [19.89, 38.40]. The adjusted R^2 value of 0.26 indicates that over a quarter of the variability in EXD is predicted by an individual's YSQ-S3 score. This result indicates that EMS positively predicted EXD. A second multiple regression analysis was conducted to determine which/if any of the YSQ-S3 EMS domain subscales were significantly involved in the prediction of EXD. This analysis revealed the domain subscales other directedness ($\beta = 0.29$, $p < .03$) and impaired limits ($\beta = 0.34$, $p = .001$) significantly predicted EXD. A stepwise linear regression analysis was conducted, using backward elimination method, to determine which of the five EMS that make up the EMS domains other directedness and impaired limits were significantly involved in the prediction of EXD. The best fitting model revealed that YSQ-S3 EMS subscales subjugation ($\beta = 0.22$, $p = .009$) and approval/recognition seeking* ($\beta = 0.21$, $p < .03$), and entitlement/grandiosity ($\beta = 0.28$, $p = .001$) were predictive EXD, $R^2 = 0.34$, $F(1, 134) = 22.35$, $p < .001$, 95% CI [15.39, 33.46]. The EMS subscales self-sacrifice and insufficient self-control/ self-discipline were non-significant.
Smartphone addiction	Arpaci (2022)	To predict problematic smartphone use based on EMSs (EMS) and five schema domains.	1000 smartphone users, 726 (72.6%) women and 274 (27.4%) men	Young Schema Questionnaire-Short Form-3 (YSQ-SF3) Smartphone Addiction Inventory (SPAI)	The second model predicted the low and high-risk smartphone users based on five schema-domains (i.e., "disconnection and rejection, impaired autonomy and performance, impaired limits, other-directedness, and over-vigilance and inhibition"). The results indicated that the schemas related to the "impaired autonomy and performance" domain (i.e., "enmeshment/dependence, vulnerability to harm, and failure") had a better performance in explaining the low and high-risk smartphone users. Further, Multi-Class Classifier ensured a

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Table 3 (continued)

Addiction	Authors	Aims	Sample	Measures	Key Findings
Smartphone addiction	Arpaci (2021)	To investigate the relationships between the EMSs and smartphone addiction. Further, this study investigated the moderating role of mindfulness in the relationships between the EMSs and smartphone addiction.	650 mobile users in Turkey. The sample consisted of 179 males (27.1%) and 481 females (72.9%) with a mean age of 22.88 years (SD = 4.57, range = 17–32)	Young Schema Questionnaire-3 (YSQ-3) Smartphone addiction inventory (SPAI) Mindful Attention Awareness Scale (MAAS)	<p>better prediction based on the schemas related to the “impaired autonomy and performance” domain with an accuracy of 66.2%.</p> <p>Multi-Class Classifier predicted the users based on the schemas related to the “disconnection and rejection” domain (i.e., “abandonment, emotional deprivation, defectiveness, social isolation/mistrust”) with an accuracy of 65.2%.</p> <p>Results indicated that approval seeking ($\beta = 0.16, p < .05$) and entitlement/insufficient self-control ($\beta = 0.25, p < .01$) were positively, but self-sacrifice ($\beta = -0.33, p < .001$), defectiveness ($\beta = -0.37, p < .001$), and emotional inhibition ($\beta = -0.21, p < .05$) were negatively, associated with smartphone addiction for addicted users</p> <p>The results indicated that social isolation/mistrust ($\beta = 0.11, p < .05$), approval seeking ($\beta = 0.27, p < .001$), and abandonment ($\beta = 0.12, p < .05$) were positively, but the schema of unrelenting standards ($\beta = -0.12, p < .05$) was negatively, associated with smartphone addiction for intermittent users.</p> <p>On the other hand, none of the schemas were significantly associated with smartphone addiction for average users. The results indicated that the EMS accounted for a total variance (R²) of 44%, 15%, and 1.7% in explaining smartphone addiction for addicted, intermittent, and average users, respectively</p>
Gambling addiction	Shorey, Anderson, and Stuart (2012a, 2012b)	To examine the EMSs of individuals with and without possible problematic gambling among a sample of men seeking treatment for alcohol dependence	628 patients (men) diagnosed with alcohol dependence	Gambling questionnaire (created by the treatment facility) The Young Schema Questionnaire – Long Form, Third Edition (YSQ-L3)	<p>Gambling was significantly and positively associated with 12 of the 18 EMSs. This included abandonment, approval-seeking, dependence, emotional deprivation, emotional inhibition, entitlement, insufficient self-control, mistrust/abuse, negativity/pessimism, punitiveness, social isolation, and vulnerability.</p> <p>All EMSs were positively and significantly associated with each other, with the majority of correlations falling into the 0.40 to 0.50 range.</p> <p>Potential problem gamblers scored significantly higher than non-problem gamblers on 11 of the 18 schemas. For potential problem gamblers the EMSs rated as high or very high most often were self-sacrifice (79.9%), unrelenting standards (65.4%), insufficient self-control (63.3%), punitiveness (57.2%), and emotional inhibition (51.1%). For non-problem gamblers the EMSs rated as high or very high most often were self-sacrifice (60.5%), unrelenting standards (57.0%), punitiveness (40.7%), insufficient self-control (37.3%), and negativity/pessimism (32.6%).</p> <p>The mean (or median) score for all domains (except the guided by others/attention) in students with addiction to social networks was higher so that the difference in the scheme of detachment and exclusion ($P = .004$), guided by others ($P = .024$), and self-regulation and impaired performance ($P = .002$) were significant.</p>
Social networking addiction	Kahouei et al. (2020)	To determine the relationship between EMSs and social network addiction among students	384 medical science students (219 female and 165 male students)	Young Schema Questionnaire (YSQ) Mobile-based Social Network Addiction Questionnaire	<p>The mean (or median) score for all domains (except the guided by others/attention) in students with addiction to social networks was higher so that the difference in the scheme of detachment and exclusion ($P = .004$), guided by others ($P = .024$), and self-regulation and impaired performance ($P = .002$) were significant.</p>

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Table 3 (continued)

Addiction	Authors	Aims	Sample	Measures	Key Findings
Social network (Facebook) addiction	Cudo, Maçik, et al., 2020, Cudo, Torój, et al. (2020)	To verify the extent to which Facebook use characteristics and EMSs contribute to explaining Problematic Facebook Use.	619 participants (568 females) aged 18–30 years (M = 21.34 years, SD = 2.41)	Facebook Intrusion Scale Young Schema Questionnaire (YSQ–S3)	There was a positive relationship between PFU and almost all EMSs, except emotional deprivation, social isolation/alienation, self-sacrifice, emotional inhibition, and unrelenting standards. Additionally, insufficient self-control/self-discipline and approval-seeking had significant positive beta weights, whereas social isolation/alienation and self-sacrifice had significant negative beta weights. There was a negative relationship between the self-sacrifice schema and PFU. More specifically, the lack of a tendency to take care of others instead of themselves [23] may contribute to increased problems with Facebook use. The correlation analysis showed that PFU was positively associated with the number of hours spent playing videogames per week, playing action videogames, anxiety, depression, and almost all EMS except self-sacrifice, entitlement/superiority, and admiration/recognition seeking among female gamers Additionally, PVG was positively associated with almost all EMSs except the self-sacrifice schema. For male gamers, vulnerability to harm or illness was positively related to PVG. Additionally, there was a positive association between subjugation and PVG as well as between enmeshment and PVG.
Problematic video gaming	Cudo et al. (2022)	To investigate the relationship between PVG and EMSs, and depression and anxiety as mediators of this relationship among female and male gamers.	673 participants (391 females) who had played videogames in the past year	Internet Gaming Disorder Scale–Short-Form (IGDS9-SF) Hospital Anxiety and Depression Scale (HADS) Young Schema Questionnaire (YSQ–S3)	High scores for addiction matched high scores for all but three maladaptive schemas. Only two exceptions were found. On the SSBA, no significant differences were found in impaired limits between high and low levels of cocaine or gambling, nor any difference in overvigilance between high and low levels of gambling on the SSBA.
Multiple Addictive Behaviours	Efrati et al. (2022)	To explore the possible associations between substance and addictive behaviours and cognitive distortions in the form of EMSs among Jewish adolescents in Israel	1948 participants (756 male and 1192 female) (Mean age = 16.20 years; SD = 1.83)	Screeener for Substance and Behavioural Addictions (SSBA) The Young Schema Questionnaire—Short Form 3 (YSQ-S3)	Participants who had positive scores with the YFAS 2.0 and the IAT showed significantly higher scores on all four-schema domains, whereas participants who were positive on the SOGS exhibited higher scores on the impaired autonomy and performance and impaired limits schema domains. Average scores of all domains increased with the association of two or more comorbid Bas.
Multiple Addictive Behaviours	Aloi, Rania, et al. (2020)	To assess the possible association of specific Bas (food addiction, internet addiction, and gambling addiction) with EMSs and gender	1075 participants (N = 637; 59.3% women) with a mean age of 19.69 ± 1.7 (17–24) years old	Young Schema Questionnaire Short Form-3 (YSQ–S3) Internet Addiction Test (IAT) South Oaks Gambling Screen (SOGS) Yale Food Addiction Scale 2.0 (YFAS 2.0) Short Form-12 Health Survey (SF-12)	Participants who had positive scores with the YFAS 2.0 and the IAT showed significantly higher scores on all four-schema domains, whereas participants who were positive on the SOGS exhibited higher scores on the impaired autonomy and performance and impaired limits schema domains. Average scores of all domains increased with the association of two or more comorbid Bas.

1987) (n = 1) for gambling addiction, and the Screener for Substance and Behavioural Addictions (SSBA; Schluter, Hodgins, Wolfe, & Wild, 2018) (n = 1) for multiple addictive behaviours.

Other screening tools used by the studies in the present review included the Exercise Dependence Scale Revised (EDS-21; Hausenblas & Downs, 2002) (n = 1) for exercise addiction, the Internet Addiction Test (IAT; Young, 1998) (n = 1), the Generalized Pathological Internet Use Scale (GPIUS; Caplan, 2002) (n = 1) for internet addiction, and the Smartphone Addiction Inventory (SPAI; Lin et al., 2014) (n = 2) for smartphone addiction.

3.7. Statistical analyses

A wide range of statistical analyses were used across studies (with some studies using more than one type of analysis). The statistical

analysis most used was correlation analysis (n = 13) to explore the relationship between early maladaptive schemas and behavioural addictions, and *t*-tests (n = 4) to evaluate differences between groups. Other statistical analysis included regression analysis (n = 8), discriminant analysis (n = 1), partial least squares regression analysis (n = 1), structural equation modelling (SEM) (n = 1), covariance-based SEM (CB-SEM) (n = 1), multi-class classification using machine learning algorithms (n = 1).

3.8. Outcomes

3.8.1. Binge eating and food addiction

Six studies examined the relationship between early maladaptive schemas and binge eating/food addiction. A study conducted in Australia by Anderson et al. (2006) attempted to establish whether

treatment-seeking obese adults ($n = 52$) presented a greater severity of schemas than the control group, consisting of normal-weight adults ($n = 39$). Results indicated that the obese group obtained a significantly higher total score on the Young Schema Questionnaire (YSQ) compared to the control group. In addition, within the obese group, a significant positive correlation of medium effect size was obtained between YSQ and Binge-Eating Scale (BES) scores. However, the association between YSQ and BES scores within the normal-weight group was not significant. It was also reported that the core maladaptive schemas which were associated with obese status were social isolation, defectiveness and shame, and failure.

Studies by both [da Luz et al. \(2017\)](#) ($n = 111$) in Brazil and [Basile et al. \(2019\)](#) ($n = 75$) in Italy reported higher scores in early maladaptive schemas among overweight and obese individuals, particularly concerning the insufficient self-control schema, when compared to control group consisting of normal-weight adults ($n = 58$ and $n = 37$ respectively). However, [Basile et al. \(2019\)](#) also reported high scores on the abandonment, dependence, and subjugation schemas. These maladaptive schemas were also found to have a strong association with binge-eating disorder in a study conducted by [Aloi, Rania, et al., 2020](#), [Aloi, Verrastro, et al. \(2020\)](#) with 100 adult women in Italy. In relation to schema modes, [Basile et al. \(2019\)](#) found that the Vulnerable and Impulsive child and the Detached Protector were higher in the overweight group, whereas the Happy child and the Healthy adult were stronger in the control group.

Despite not specifying each early maladaptive schema, a study conducted by [Zhu et al. \(2016\)](#), using a sample of 2172 middle and high-school Chinese students, reported that binge eating was positively and significantly correlated with life event stress, early maladaptive schemas, and impulsivity. Lastly, [Imperatori et al. \(2017\)](#) assessed the association between dysfunctional eating patterns (including food addiction and binge eating) and EMSs among 70 overweight and obese Italian women. Using the YSQ, the findings suggested that binge eating severity was positively associated with disconnection/rejection, impaired limits, and other-directedness domains.

The main limitations from these studies were the use of self-report questionnaires which may be affected by a social desirability bias and lack of discrimination between over-eaters with and without binge-eating disorder ([Basile et al., 2019](#)). In addition, the studies conducted by [Zhu et al. \(2016\)](#) ($n = 2172$) and [Imperatori et al. \(2017\)](#) ($n = 70$) did not discriminate which individual early maladaptive schemas were associated with binge-eating/food addiction, reporting wider scores on schema domains. This limits the understanding between the specific role of individual EMSs in the development and maintenance of food addiction.

3.8.2. Sexual addiction and sexual compulsive behaviours

Three studies assessed the relationship between early maladaptive schemas and sexual addiction/sexual compulsive behaviours. [Azemat et al. \(2016\)](#) examined and compared maladaptive schemas among male Iranian adult sexual addicts ($n = 30$) and the control group, consisted of 30 adult men with no sexual addiction. The findings of this study suggested that five specific schemas were the best predictors of sexual addiction, including Dependence/Incompetence, Mistrust/Abuse, Subjugation, Vulnerability to Harm, and Emotional Deprivation.

Consistent with these findings, a study by [Elmquist et al. \(2016\)](#) in the US examined the relationship between EMSs and compulsive sexual behaviours among a sample of men and women in residential treatment for a substance-use dependence ($n = 260$). The Sexual Addiction Screening Test-Revised (SAST-R; [Carnes et al., 2010](#)) was used to assess the presence compulsive sexual behaviours. Participants whose cut-off scores were 6 or above were classified as exhibiting compulsive sexual behaviours, whereas the control group comprised those with scores below 6 and not classified as displaying compulsive sexual behaviours. [Elmquist et al. \(2016\)](#) found that those with compulsive sexual behaviours scored significantly higher than the control group in the domain of

Disconnection/Rejection. In addition, the study also suggested that individuals with problematic sexual behaviour scored higher on the domain of Impaired Limits.

In Israel, [Efrati et al. \(2021\)](#) conducted a similar study to explore associations between compulsive sexual behaviours and cognitive distortions in the form of early maladaptive schemas among individuals who sought treatment for compulsive sexual behaviour (Sexaholics Anonymous Group) ($n = 68$) and both violent ($n = 81$) and sex offenders ($n = 103$). Schema domains of Disconnection and Rejection, Impaired Autonomy and Performance, Other Directedness, and Overvigilance and Inhibition were indicative of the severity of compulsive sexual behaviours among both groups. The findings suggested that individuals with higher levels of compulsive sexual behaviour presented with impaired internal and interpersonal limits that might underpin both the lack of behavioural control and the persistent and compulsive engagement with sexual fantasies.

However, these studies were not without limitations and weaknesses. The study conducted by [Azemat et al. \(2016\)](#), despite its promising findings, only used male participants and a very small sample ($n = 30$). [Elmquist et al. \(2016\)](#) study presented its findings in terms of schema domains as opposed to specifying which early maladaptive schemas were positively correlated with compulsive sexual behaviours. There was also the recognition by the authors that there was no current agreement with regards to diagnostic criteria for compulsive sexual behaviours, which limits the assessment of this problematic behaviour. Similarly, in the study conducted by [Efrati et al. \(2021\)](#), participants from the Sexaholic Anonymous Group defined themselves as having compulsive sexual behaviours but no clinical interview was conducted to confirm the diagnosis.

3.8.3. Internet addiction

Two studies in Iran ([Ostovar et al., 2021](#); [Shajari et al., 2016](#)) examined the role of early maladaptive schemas in relation to internet addiction. Both studies found a positive relationship between maladaptive schemas and internet addiction. [Ostovar et al. \(2021\)](#) ($n = 714$ adults) reported a stronger relationship between the Disconnection/Rejection and Impaired Autonomy/Performance domains and the potential variance in internet addiction, highlighting the role of specific early maladaptive schemas such as abandonment, mistrust/abuse, emotional deprivation, social isolation/alienation, defective/shame, dependence/incompetence, vulnerability to harm and illness, enmeshment/undeveloped self, and failure. [Shajari et al. \(2016\)](#) ($n = 195$ University students), on the other hand, found that the association between Other Directedness domain and internet addiction was higher than that of other domains, followed by Impaired Autonomy, highlighting the role of the subjugation schema in this relationship.

These two studies showed promising findings in relation to the role of specific early maladaptive schemas in the development and maintenance of internet addiction. The main weaknesses of these two studies were the use of self-report questionnaires as opposed to structured interviews. In addition, no control group of non-internet addicts were used. Using control groups to compare the effect of the early maladaptive schemas between addicts and non-addicts would provide further data on the nature of the relationship and the role that early maladaptive schemas have on the development of this type of addiction.

3.8.4. Smartphone addiction

Two studies conducted by [Arpaci \(2021, 2022\)](#) in Turkey attempted to predict problematic smartphone use based on the presence of early maladaptive schemas. One of the studies ([Arpaci, 2022](#)) ($n = 1000$) suggested that EMSs such as enmeshment/dependence, vulnerability to harm, and failure were the strongest predictors of problematic smartphone use. The second study ([Arpaci, 2021](#)) ($n = 660$) classified smartphone users according to their score on the Smartphone Addiction Inventory (SPAI). Given a total score of the SPAI ranging from 26 to 104, smartphone users who scored between 26 and 51 points were defined as

an average user, whereas those who scored between 52 and 77 points were defined as an intermittent user. Participants who scored >78 points were classified as an addicted user. The findings of this study indicated that among smartphone addicts, approval-seeking, entitlement, and insufficient self-control were positively associated, whereas self-sacrifice, defectiveness, and emotional inhibition were negatively associated. Among intermittent users, social isolation/mistrust, approval seeking, and abandonment were the strongest predictors of problematic smartphone use, with the unrelenting standards schema being negatively associated. Moreover, none of the early maladaptive schemas were significantly correlated with problematic smartphone use for average users.

The main weaknesses from these two studies were that self-report scales may have led to bias in participants' responses and studies did not control for the effects of mental health (e.g., anxiety and depression), which may have played a role in the relationship between early maladaptive schemas and smartphone addiction. Lastly, these studies used participants from non-clinical samples. As such, the relationship between smartphone addiction and maladaptive schemas among clinical samples remains unclear.

3.8.5. Multiple addictive behaviours

Two studies have examined the possible associations between early maladaptive schemas and behavioural addiction, including gambling, shopping, gaming, eating, sex, and social networking. With a sample of 1948 Israeli adolescents, Efrati et al. (2022) reported that high scores on the addiction scale were correlated to high scores for all but three schema domains. Using the Screener for Substance and Behavioural Addictions (SSBA; Schluter et al., 2018), no significant differences were found in the Impaired Limits domain between high and low levels of cocaine or gambling, nor any variance in the Overvigilance domain between high and low levels of gambling. A study conducted by Aloi, Rania, et al., 2020, Aloi, Verrastro, et al. (2020), with a sample of 1075 Italian university and high-school students, indicated a positive relationship between food addiction and internet addiction, and all four schema domains (Disconnection and Rejection, Impaired Autonomy and Performance, Excessive Responsibility and Standards, and Impaired Limits) whereas gambling addiction was associated with higher scores on the Impaired Autonomy and Performance and Impaired Limits domains.

The main weaknesses from these two studies were that self-report measures were used which can be subject to response bias. In addition, both studies did not specify which specific early maladaptive schemas were positively associated with different addictive behaviours, only reporting overall scores on schema domains. Moreover, the sample recruited by Efrati et al. (2022) was limited to Jewish adolescents from the general population in Israel, whereas Aloi, Rania, et al., 2020, Aloi, Verrastro, et al. (2020) recruited a sample of adolescents and young adults from the general population of Italy. As such, consideration is to be taken when generalizing the results to other countries and cultural contexts.

3.8.6. Exercise dependence

Only one study (i.e., Rankin et al., 2021) has examined the relationship between early maladaptive schemas and exercise dependence. Using a sample of 136 adult Australian cyclists, Rankin et al. (2021) found that individual scores on the YSQ predicted exercise dependence, with the subscales Other Directedness and Impaired Limits being the strongest predictors. In relation to specific early maladaptive schemas, the schemas subjugation, approval seeking, and entitlement/grandiosity were the most significant predictors, with self-sacrifice and insufficient self-control being non-significant. However, it is worth noting the fact that the measures used in this study were a screening tool as opposed to structured interview protocols or clinical tools. This limits the understanding and the discussion of the relationship between exercise dependency and early maladaptive schemas.

3.8.7. Problem gambling

One study (i.e., Shorey, Anderson, & Stuart, 2012a, 2012b) has examined the relationship between early maladaptive schemas and problematic gambling among US men in treatment for alcohol dependence ($n = 628$). The substance use treatment facility created five questions to assess gambling symptom severity at intake. These questions were based on DSM-IV-TR criteria for pathological gambling, although they were not intended to fully capture the possible range of behaviours that comprise pathological gambling. Each patient was instructed to answer Yes/No to the following five questions, with a time frame of the past 12 months: (1) "I have gambled more than I intended"; (2) "I have claimed to be winning money when I was not"; (3) "I have felt guilty about the way I gamble or about what happens when I gamble"; (4) "I have had people criticize my gambling"; and (5) "I have had money problems that centered on my gambling". This measure was scored in two ways. First, a total score was obtained by summing all five items, with scores ranging from 0 to 5. Second, scores were dichotomized such that individuals who responded "Yes" to any of the five questions were given a score of "1" to indicate the presence of a possible gambling problem and individuals who answered 'No' to all questions were given a score of "0" to indicate the absence of a gambling problem.

The findings indicated that gambling was significantly and positively associated with all but six maladaptive schemas, including abandonment, approval-seeking, dependence, emotional deprivation, emotional inhibition, entitlement, insufficient self-control, mistrust/abuse, negativity/pessimism, punitiveness, social isolation, and vulnerability. For individuals who were at-risk of problematic gambling, the strongest schemas were self-sacrifice, unrelenting standards, insufficient self-control, punitiveness, and emotional inhibition. Among non-problem gamblers, the most significant schemas were self-sacrifice, unrelenting standards, punitiveness, insufficient self-control, and negativity/pessimism.

One of the main limitations of this study is related to the assessment of the gambling behaviour. The treatment facility did not use a standard measure of gambling behaviour, opting to create five questions to screen for this problem. The use of clinical interviews and of standard assessment tools is recommended for further research in this field because it would allow a precise way of classifying individuals as having gambling disorder. Another weakness of this study was related to a lack of measurement of alcohol use severity or frequency. This limits the understanding of the relationship between early maladaptive schemas and gambling behaviour at different severities and frequency of alcohol intake.

3.8.8. Social networking/Facebook addiction

One study (i.e., Kahouei et al., 2020) examined the relationship between early maladaptive schemas and social networking addiction among 384 Iranian medical science students. The findings indicated that the presence of entitlement, social isolation, and emotional inhibition EMSs were the best predictors of social networking addiction. However, the study did not specify which specific social networking platform was being studied and therefore caution should be used with regards to generalize to all social networking platforms. Another study (Cudo, Maçik, et al., 2020; Cudo, Torój, et al., 2020) conducted in Poland ($n = 619$ adult Facebook users) examined the extent to which Facebook use characteristics and early maladaptive schemas contributed to explaining problematic Facebook use. The findings indicated there was a positive relationship between problematic Facebook use and all maladaptive schemas apart from emotional deprivation, social isolation, self-sacrifice, emotional inhibition, and unrelenting standards. In addition, the study also reported a negative relationship between the early maladaptive schema of self-sacrifice and problematic Facebook use. Taking into consideration that problematic Facebook use is only one example of problematic social media use, similar to Kahouei et al.'s study, the findings should be interpreted with caution and not generalized to other social networking platforms.

3.8.9. Problematic gaming

One Polish study (i.e., Cudo et al., 2022) examined the relationship between problematic videogame playing and EMSs among female and male gamers. Using a sample of 673 participants, Cudo et al. reported that problematic gaming was positively associated with all early maladaptive schemas (emotional deprivation, defectiveness/unlovability, mistrust, social isolation/alienation, emotional inhibition, pessimism, vulnerability to harm, abandonment, enmeshment, failure, subjugation, unrelenting standards, self-punitiveness, insufficient self-control) except self-sacrifice, entitlement/superiority, and admiration-seeking among female gamers. Despite the promising findings, the study selected its sample from the Polish population. As such, consideration is to be taken when generalizing the results to other countries. In addition, taking into account that the study used self-report methods as opposed to clinical and diagnostic tools, the understanding of the relationship between problematic gaming and maladaptive schemas might be limited.

4. Discussion

Behavioural addiction and their relationship to early maladaptive schemas appear to become a subject of interest among both academics and clinicians, with significant implications for clinical formulations, treatment plans, and research. Early maladaptive schemas are thought to have a significant role in both personality and interpersonal functioning, being associated with a variety of mental health conditions, including personality disorders, anxiety and mood disorders, and addiction. The present review aimed to systematically review the evidence of studies that explored and assessed the relationship between maladaptive schemas and a wide range of addictive behaviours, including addictions to the internet, gambling, gaming, social networking, eating, sex, and exercise.

The present systematic literature review, which examined findings from 20 studies with both clinical and nonclinical samples, suggests behavioural addiction is positively associated with high scores in the subscales of the Young Schema Questionnaire (YSQ). The domain Disconnection and Rejection (which includes the schemas abandonment, emotional deprivation, defectiveness, mistrust and abuse, and social isolation) was the most strongly related domain across all behavioural addiction, followed by Impaired Limits (entitlement and insufficient self-control), Impaired Autonomy and Performance (dependence, vulnerability to harm, enmeshment, and failure), Other-Directedness (subjugation, self-sacrifice, and approval-seeking), and Overvigilance and Inhibition (negativity/pessimism, emotional inhibition, unrelenting standards, and punitiveness).

These findings are in line with previous studies which highlight the impact of unmet core needs and adverse childhood experiences in the development of early maladaptive schemas and respective maladaptive coping strategies, including addictive and compulsive behaviour (Ahmadpanah et al., 2017; Kaya & Aydin, 2021). Moreover, the Disconnection and Rejection schema domain was intrinsically associated with an insecure attachment style and with neglected core emotional needs such as love, support, and belonging. Early maladaptive schemas associated with this domain are related to traumatic childhood experiences, often characterized by rejection, social isolation, abuse, and unpredictability. Individuals with high scores in these schemas often develop several coping mechanisms to reduce psychological distress and emotional pain, including maladaptive self-soothing strategies such as compulsive pornography use, binge eating, gambling, problematic social media use, and risky sexual behaviours.

Impaired Limits, the second higher schema domain associated with behavioural addiction, is related to problems with setting both personal and interpersonal boundaries. Individuals with high scores in this schema domain are vulnerable to struggle in regulating their emotions, managing their impulses, and engaging in goal-orientated behaviours. The most strongly related early maladaptive schema in this domain across all studies was Insufficient Self-Control, which is characterized by

impaired emotional tolerance and self-discipline. This schema is associated with short-term gratification and with a lack of consequential thinking (Young et al., 2003). Consequently, individuals with high scores in this schema often engage in impulsive and behavioural addiction, despite the negative outcomes across different contexts in their lives. These findings are consistent with those from studies which have examined the relationship between EMSs and substance misuse (Shorey, Anderson, & Stuart, 2012a, 2012b; Shorey, Stuart, & Anderson, 2012). Both among opioid users (Shorey, Anderson, & Stuart, 2012a, 2012b) and alcohol users (Shorey, Stuart, & Anderson, 2012), the insufficient self-control schema appeared to be positively related with addiction and impulsive behaviours.

The overall findings from this review further strengthen the formulation of behavioural addiction and their underpinning early maladaptive schemas. It highlights the clinical significance of conceptualizing and understanding the way individuals with behavioural addiction perceive the world, themselves, and others. This formulation allows clinicians to not only address and reduce the expression of maladaptive coping responses but also to heal psychological distress and meet core emotional needs.

4.1. Clinical implications

A wide range of clinical implications is worthy of discussion and consideration. The present systematic literature review suggests a potential role of early maladaptive schemas in the aetiology and maintenance of behavioural addiction within the schema therapy model. As such, results of this review might inform further schema therapy interventions and formulations, particularly when considering which maladaptive schemas and schema modes to address in the consulting room. In addition, the review's findings suggest overlap between different types of behavioural addiction and their link to psychological vulnerability and emotional pain, for which schema therapy has shown to be an effective model of intervention. The findings also suggest the benefit of using schema-related psychometrics (e.g., YSQ and Schema Mode Inventory) to collate information about early maladaptive schemas which, in turn, can facilitate the development of appropriate treatment plans and clinical formulations for those with behavioural addiction. Lastly, the present paper summarised a wide range of assessment tools that assess behavioural addiction, including (among many others) the Individual-Based Compulsive Sexual Behaviour (I-CSB; Efrati & Mikulincer, 2018), the Binge Eating Scale (BES; Gormally et al., 1982), the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987), and the Internet Gaming Disorder Scale-Short Form (IGDS9-SF; Pontes & Griffiths, 2015). Such tools facilitate clinical discussions with those with behavioural addiction and inform psychological interventions, as well as supporting the expansion of academic research in the field.

4.2. Limitations

The present review systematically examined the evidence regarding the relationship between early maladaptive schemas and behavioural addiction. However, it is not without limitations. First, a large proportion of studies (19 out of 20) used a cross-sectional research design, which means the studies are unable to establish causation and temporality between maladaptive schemas and behavioural addiction. As such, the findings should be interpreted with caution, and longitudinal research is needed to determine the temporal relations between behavioural addiction and early maladaptive schemas over time. Second, some studies ($n = 9$) did not specify which particular schemas were associated with behavioural addiction, and only referred to the general schema domains. This limits the understanding of which specific individual schemas are best predictors of the different types of behavioural addiction and to what extent they might interact with each other. Third, despite most studies using mixed gender populations ($n = 18$) some studies only included males ($n = 3$) or only included females ($n = 4$).

Male-only studies tended to be biased toward sexual addiction/compulsive sexual behaviours, whereas studies which only included female participants tended to be biased toward food addiction. Also, the review incorporated only four studies that included participants who were under 17 years old. This limits the understanding of the interaction between early maladaptive schemas and behavioural addiction in the teenage years, which could provide both clinicians and researchers with insights concerning emerging personality traits of those who are vulnerable in developing behavioural addiction.

Fourth, two studies (Shorey, Anderson, & Stuart, 2012a, 2012b; Zhu et al., 2016) used non-validated scales to screen behavioural addiction as opposed to using structured interviews or diagnostic tools. Self-report questionnaires were used across studies to diagnose specific behavioural addiction, which does not allow further questioning and clarification concerning individual responses as would be the case in interview-based methods. Fifth, with regards to sample characteristics, studies that comprised treatment-seeking samples had the limitation of the findings not necessarily being generalized to the community non-clinical population and vice-versa. Sixth, the samples in each study were also specific to the context and country where the research was carried out (e.g., Polish, Iranian), limiting the generalizability of the findings to other countries and cultural contexts. Finally, the representation of each addiction in this review was not even. Whereas for binge-eating/food addiction the present review included six studies, for other addictions, such as exercise dependence and gambling, only one study for each addiction was included. This limits both generalizability of the findings as well as a deeper analysis on the differences between specific addictions and their relationship with EMSs.

Taking these limitations into account, the findings in the present review should be discussed and interpreted with caution. While all studies suggested a positive relationship between early maladaptive schemas and behavioural addiction, they also highlight the complexity of both predisposing and perpetuating factors that contribute to this specific phenomenon, with different studies highlighting different early maladaptive schemas in the aetiology of behavioural addiction.

5. Conclusion

Behavioural addiction are often linked to the experience of mental health difficulties, including depression, anxiety, and relationship problems. There has been ongoing research on the mechanisms underpinning such addictive behaviour and on the development of evidence-based interventions to effectively address them. Schema therapy formulates psychological problems and distress as being closely related to the development of early maladaptive schemas and unmet emotional needs. The present systematic review assessed and discussed the current state of research regarding the relationship between maladaptive schemas and behavioural addiction. Although the findings cannot be applied to the general population, the present review suggests a positive relationship between schema activation and several addictive behaviours, including addictions to gambling, gaming, social media use, sex, exercise, and food. Diverse samples, longitudinal methodological designs, and different statistical analyses are crucial to further clarify this relationship, continuing to inform treatment plans and interventions for those who struggle with behavioural addiction.

Declaration of Competing Interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article except MDG. MDG has received research funding from *Norsk Tipping* (the gambling operator owned by the Norwegian government). MDG has received funding for a number of research projects in the area of gambling education for young people, social responsibility in gambling and gambling treatment from Gamble Aware (formerly the Responsibility in Gambling Trust), a charitable body which funds its research program based on

donations from the gambling industry. MDG undertakes consultancy for various gambling companies in the area of social responsibility in gambling.

References

- Ahmadpanah, M., Astinsadaf, S., Akhondi, A., Haghghi, M., Sadeghi Bahmani, D., Nazaribadie, M., Jahangard, L., Holsboer-Trachslers, E., & Brand, S. (2017). Early maladaptive schemas of emotional deprivation, social isolation, shame and abandonment are related to a history of suicide attempts among patients with major depressive disorders. *Comprehensive Psychiatry*, 77, 71–79. <https://doi.org/10.1016/j.comppsych.2017.05.008>
- Alimoradi, Z., Lotfi, A., Lin, C. Y., Griffiths, M. D., & Pakpour, A. H. (2022). Estimation of behavioral addiction prevalence during COVID-19 pandemic: A systematic review and meta-analysis. *Current Addiction Reports*, 9(4), 486–517. <https://doi.org/10.1007/s40429-022-00435-6>
- Aloi, M., Rania, M., Caroleo, M., Carbone, E. A., Fazio, G., Calabrò, G., & Segura-García, C. (2020). How are early maladaptive schemas and DSM-5 personality traits associated with the severity of binge eating? *Journal of Clinical Psychology*, 76(3), 539–548. <https://doi.org/10.1002/jclp.22900>
- Aloi, M., Rania, M., Rodríguez Muñoz, R. C., Jiménez Murcia, S., Fernández-Aranda, F., De Fazio, P., & Segura-García, C. (2017). Validation of the Italian version of the Yale food addiction scale 2.0 (I-YFAS 2.0) in a sample of undergraduate students. *Eating and Weight Disorders*, 22(3), 527–533. <https://doi.org/10.1007/s40519-017-0421-x>
- Aloi, M., Verrastro, V., Rania, M., Sacco, R., Fernández-Aranda, F., Jiménez-Murcia, S., ... Segura-García, C. (2020). The potential role of the early maladaptive schema in behavioral addictions among late adolescents and young adults. *Frontiers in Psychology*, 10, 3022. <https://doi.org/10.3389/fpsyg.2019.03022>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5™* (5th ed.). American Psychiatric Publishing.
- Anderson, K., Rieger, E., & Catterton, I. (2006). A comparison of maladaptive schemata in treatment-seeking obese adults and normal-weight control subjects. *Journal of Psychosomatic Research*, 60(3), 245–252. <https://doi.org/10.1016/j.jpsychores.2005.08.002>
- Arpaci, I. (2021). Relationships between early maladaptive schemas and smartphone addiction: The moderating role of mindfulness. *International Journal of Mental Health and Addiction*, 19(3), 778–792. <https://doi.org/10.1007/s11469-019-00186-y>
- Arpaci, I. (2022). Predicting problematic smartphone use based on early maladaptive schemas by using machine learning classification algorithms. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*. <https://doi.org/10.1007/s10942-022-00450-6>. Advance online publication.
- Azemat, E., Mohammadian, A., Abaid, N., & Mohammadkhani, P. (2016). A comparative examination of maladaptive schemas in sex addicts and normal individuals. *Journal of Practice in Clinical Psychology*, 4(3), 159–166. <https://doi.org/10.15412/J.JPCP.06040303>
- Bach, B., Lockwood, G., & Young, J. E. (2018). A new look at the schema therapy model: Organization and role of early maladaptive schemas. *Cognitive Behaviour Therapy*, 47(4), 328–349. <https://doi.org/10.1080/16506073.2017.1410566>
- Barazandeh, H., Kissane, D. W., Saeedi, N., & Gordon, M. (2016). A systematic review of the relationship between early maladaptive schemas and borderline personality disorder/traits. *Personality and Individual Differences*, 94(1), 130–139. <https://doi.org/10.1016/j.paid.2016.01.02>
- Basile, B., Tenore, K., Luppino, O. I., & Mancini, F. (2017). Schema therapy mode model applied to OCD. *Clinical Neuropsychiatry*, 14, 407–414.
- Basile, B., Tenore, K., & Mancini, F. (2019). Early maladaptive schemas in overweight and obesity: A schema mode model. *Heliyon*, 5(9), Article e02361. <https://doi.org/10.1016/j.heliyon.2019.e02361>
- Brand, M., Wegmann, E., Stark, R., Müller, A., Wölfling, K., Robbins, T. W., & Potenza, M. N. (2019). The interaction of person-affect-cognition-execution (I-PACE) model for addictive behaviors: Update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neuroscience & Biobehavioral Reviews*, 104, 1–10. <https://doi.org/10.1016/j.neubiorev.2019.06.032>
- Calado, F., Alexandre, J., & Griffiths, M. D. (2017). Prevalence of adolescent problem gambling: A systematic review of recent research. *Journal of Gambling Studies*, 33(2), 397–424. <https://doi.org/10.1007/s10899-016-9627-5>
- Calado, F., & Griffiths, M. D. (2016). Problem gambling worldwide: An update and systematic review of empirical research (2000–2015). *Journal of Behavioral Addictions*, 5(4), 592–613. <https://doi.org/10.1556/2006.5.2016.073>
- Caplan, S. E. (2002). Problematic internet use and psychosocial well-being: Development of a theory-based cognitive-behavioral measurement instrument. *Computers in Human Behavior*, 18(5), 553–575. [https://doi.org/10.1016/S0747-5632\(02\)00004-3](https://doi.org/10.1016/S0747-5632(02)00004-3)
- Carnes, P., Green, B., & Carnes, S. (2010). The same yet different: Refocusing the sexual addiction screening test (SAST) to reflect orientation and gender. *Sexual Addiction & Compulsivity*, 17(1), 30–37. <https://doi.org/10.1080/10720161003604087>
- Cheng, C., Lau, Y. C., Chan, L., & Luk, J. W. (2021). Prevalence of social media addiction across 32 nations: Meta-analysis with subgroup analysis of classification schemes and cultural values. *Addictive Behaviors*, 117, 106845. <https://doi.org/10.1016/j.addbeh.2021.106845>
- Cowlshaw, S., Merkouris, S., Chapman, A., & Radermacher, H. (2014). Pathological and problem gambling in substance use treatment: A systematic review and meta-analysis. *Journal of Substance Abuse Treatment*, 46(2), 98–105. <https://doi.org/10.1016/j.jsat.2013.08.019>

- Cudo, A., Dobosz, M., Griffiths, M. D., & Kuss, D. J. (2022). The relationship between early maladaptive schemas, depression, anxiety and problematic video gaming among female and male gamers. *International Journal of Mental Health and Addiction*. <https://doi.org/10.1007/s11469-022-00858-2>. Advance online publication.
- Cudo, A., Maçik, D., Griffiths, M. D., & Kuss, D. J. (2020). The relationship between problematic Facebook use and early maladaptive schemas. *Journal of Clinical Medicine*, 9(12), 3921. <https://doi.org/10.3390/jcm9123921>
- Cudo, A., Toró, M., Misiuro, T., & Griffiths, M. D. (2020). Problematic Facebook use and problematic video gaming among female and male gamers. *Cyberpsychology, Behavior and Social Networking*, 23(2), 126–133. <https://doi.org/10.1089/cyber.2019.0252>
- Dadomo, H., Panzeri, M., Caponcello, D., Carmelita, A., & Grecucci, A. (2018). Schema therapy for emotional dysregulation in personality disorders: A review. *Current Opinion in Psychiatry*, 31(1), 43–49. <https://doi.org/10.1097/YCO.0000000000000380>
- Efrati, Y., Kolubinski, D. C., Marino, C., & Spada, M. M. (2022). Early maladaptive schemas are associated with adolescents' substance and behavioral addictions. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*. <https://doi.org/10.1007/s10942-022-00478-8>. Advance online publication.
- Efrati, Y., & Mikulincer, M. (2018). Individual-based compulsive sexual behavior scale: Its development and importance in examining compulsive sexual behavior. *Journal of Sex & Marital Therapy*, 44(3), 249–259. <https://doi.org/10.1080/0092623X.2017.1405297>
- Efrati, Y., Shukron, O., & Epstein, R. (2021). Early maladaptive schemas are highly indicative of compulsive sexual behavior. *Evaluation & the Health Professions*, 44(2), 142–151. <https://doi.org/10.1177/0163278720983428>
- Elmqvist, J., Shorey, R. C., Anderson, S., & Stuart, G. L. (2016). A preliminary investigation of the relationship between early maladaptive schemas and compulsive sexual behaviors in a substance-dependent population. *Journal of Substance Use*, 21(4), 349–354. <https://doi.org/10.3109/14659891.2015.1029021>
- Fam, J. Y. (2018). Prevalence of internet gaming disorder in adolescents: A meta-analysis across three decades. *Scandinavian Journal of Psychology*, 59(5), 524–531. <https://doi.org/10.1111/sjop.12459>
- Flink, N., Honkalampi, K., Lehto, S. M., Leppänen, V., Viinamäki, H., & Lindeman, S. (2018). Comparison of early maladaptive schemas between borderline personality disorder and chronic depression. *Clinical Psychology & Psychotherapy*, 25(4), 532–539. <https://doi.org/10.1002/cpp.21188>
- Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity among obese persons. *Addictive Behaviors*, 7(1), 47–55. [https://doi.org/10.1016/0306-4603\(82\)90024-7](https://doi.org/10.1016/0306-4603(82)90024-7)
- Grant, J. E., Potenza, M. N., Weinstein, A., & Gorelick, D. A. (2010). Introduction to behavioral addictions. *American Journal of Drug and Alcohol Abuse*, 36(5), 233–241. <https://doi.org/10.3109/00952990.2010.491884>
- Griffiths, M. (1996). Behavioural addiction: An issue for everybody? *Employee Counselling Today*, 8(3), 19–25. <https://doi.org/10.1108/13665629610116872>
- Hausenblas, H., & Downs, D. S. (2002). Exercise dependence: A systematic review. *Psychology of Sport and Exercise*, 3, 89–123. [https://doi.org/10.1016/S1469-0292\(00\)00015-7](https://doi.org/10.1016/S1469-0292(00)00015-7)
- Hoseinifar, J., Zirak, S. R., Shaker, A., Meamar, E., Moharami, H., & Siedkalan, M. M. (2011). Comparison of quality of life and mental health of addicts and non-addicts. *Procedia - Social and Behavioral Sciences*, 30, 1930–1934. <https://doi.org/10.1016/j.sbspro.2011.10.375>
- Idrissi, S. W., Ghailan, T., Ahami, A., Azzou, F.-Z., Karjouh, K., & Mammad, K. (2018). Medición de esquemas tempranos de mala adaptación en adictos a la heroína tratados con metadona en el norte de Marruecos. *European Journal of Investigation in Health, Psychology and Education*, 8(3), 185. <https://doi.org/10.30552/ejihpe.v8i3.278>
- Imperatori, C., Innamorati, M., Lester, D., Continisio, M., Balsamo, M., Saggino, A., & Fabricatore, M. (2017). The association between food addiction and early maladaptive schemas in overweight and obese women: A preliminary investigation. *Nutrients*, 9(11), 1259. <https://doi.org/10.3390/nu9111259>
- Kahouei, M., Paknazar, F., Alimohammadi, M., & Mosayebi, G. (2020). Relationship between the early maladaptive schema and social networks addiction among Semnan University of Medical Sciences Students. *Iranian Journal of Psychiatry and Clinical Psychology*, 26(2), 228–239. <https://ijpcp.iuims.ac.ir/article-1-3051-en.html>
- Kaya, Y., & Aydin, A. (2021). The mediating role of early maladaptive schemas in the relationship between attachment and mental health symptoms of university students. *Journal of Adult Development*, 28, 15–24. <https://doi.org/10.1007/s10804-020-09352-2>
- Kim, H. S., Son, G., Roh, E. B., Ahn, W. Y., Kim, J., Shin, S. H., ... Choi, K. H. (2022). Prevalence of gaming disorder: A meta-analysis. *Addictive Behaviors*, 126, 107183. <https://doi.org/10.1016/j.addbeh.2021.107183>
- Kotyuk, E., Farkas, J., Magi, A., Eisinger, A., Király, O., Vereczkei, A., ... Demetrovics, Z. (2019). The psychological and genetic factors of the addictive behaviors (PGA) study. *International Journal of Methods in Psychiatric Research*, 28(1), Article e1748. <https://doi.org/10.1002/mpr.1748>
- Kunst, H., Lobbestael, J., Candel, I., & Batink, T. (2020). Early maladaptive schemas and their relation to personality disorders: A correlational examination in a clinical population. *Clinical Psychology & Psychotherapy*, 26(4), 418–429. <https://doi.org/10.1002/cpp.2467>
- Lesieur, H. R., & Blume, S. B. (1987). The south oaks gambling screen (SOGS): A new instrument for the identification of pathological gamblers. *American Journal of Psychiatry*, 144, 1184–1188. <https://doi.org/10.1176/ajp.144.9.1184>
- Lin, Y. H., Chang, L. R., Lee, Y. H., Tseng, H. W., Kuo, T. B. J., & Chen, S. H. (2014). Development and validation of the smartphone addiction inventory (SPAI). *PLoS One*, 9(6). <https://doi.org/10.1371/journal.pone.0098312>
- Lorains, F. K., Cowlishaw, S., & Thomas, S. A. (2011). Prevalence of comorbid disorders in problem and pathological gambling: Systematic review and meta-analysis of population surveys. *Addiction*, 106(3), 490–498. <https://doi.org/10.1111/j.1360-0443.2010.03300.x>
- Lu, L., Xu, D.-D., Liu, H.-Z., Zhang, L., Ng, C. H., Ungvari, G. S., ... Xiang, Y.-T. (2018). Internet addiction in Tibetan and Han Chinese middle school students: Prevalence, demographics and quality of life. *Psychiatry Research*, 268, 131–136. <https://doi.org/10.1016/j.psychres.2018.07.005>
- da Luz, F. Q., Sainsbury, A., Hay, P., Roekenes, J. A., Swinbourne, J., da Silva, D. C., & da Oliveira, M. S. (2017). Early maladaptive schemas and cognitive distortions in adults with morbid obesity: Relationships with mental health status. *Behavioral Science*, 7(1), 10. <https://doi.org/10.3390/bs7010010>
- Maraz, A., Griffiths, M. D., & Demetrovics, Z. (2016). The prevalence of compulsive buying: A meta-analysis. *Addiction*, 111(3), 408–419. <https://doi.org/10.1111/add.13223>
- McDonnell, E., Hevey, D., McCauley, M., & Ducray, K. N. (2018). Exploration of associations between early maladaptive schemas, impaired emotional regulation, coping strategies and resilience in opioid dependent poly-drug users. *Substance Use & Misuse*, 53(14), 2320–2329. <https://doi.org/10.1080/10826084.2018.1473438>
- Mehroof, M., & Griffiths, M. D. (2010). Online gaming addiction: The role of sensation seeking, self-control, neuroticism, aggression, state anxiety, and trait anxiety. *Cyberpsychology, Behavior and Social Networking*, 13(3), 313–316. <https://doi.org/10.1089/cyber.2009.0229>
- Meng, S. Q., Cheng, J. L., Li, Y. Y., Yang, X. Q., Zheng, J. W., Chang, X. W., ... Shi, J. (2022). Global prevalence of digital addiction in general population: A systematic review and meta-analysis. *Clinical Psychology Review*, 92, 102128. <https://doi.org/10.1016/j.cpr.2022.102128>
- Modesti, P. A., Reboldi, G., Cappuccio, F. P., Agyemang, C., Remuzzi, G., Rapi, S., ... ESH Working Group on CV Risk in Low Resource Settings. (2016a). Panethnic differences in blood pressure in Europe: A systematic review and meta-analysis. *PLoS One*, 11(1), Article e0147601. <https://doi.org/10.1371/journal.pone.0147601>
- Modesti, P. A., Reboldi, G., Cappuccio, F. P., Agyemang, C., Remuzzi, G., Rapi, S., ... ESH Working Group on CV Risk in Low Resource Settings. (2016b). Panethnic differences in blood pressure in Europe: A systematic review and meta-analysis. *PLoS One*, 11(1), Article e0147601. <https://doi.org/10.1371/journal.pone.0147601>
- Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., ... Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, 4, 1–9. <https://doi.org/10.1186/2046-4053-4-1>
- Montiel, I., Ortega-Barón, J., Basterra-González, A., González-Cabrera, J., & Machimbarrena, J. M. (2021). Problematic online gambling among adolescents: A systematic review about prevalence and related measurement issues. *Journal of Behavioral Addictions*, 10(3), 566–586. <https://doi.org/10.1556/2006.2021.00055>
- Ostovar, S., Bagheri, R., Griffiths, M. D., & Hashima, I. H. M. (2021). Internet addiction and maladaptive schemas: The potential role of disconnection/rejection and impaired autonomy/performance. *Clinical Psychology & Psychotherapy*, 28(6), 1509–1524. <https://doi.org/10.1002/cpp.2581>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, 71. <https://doi.org/10.1136/bmj.n71>
- Pontes, H. M., & Griffiths, M. D. (2015). Measuring DSM-5 internet gaming disorder: Development and validation of a short psychometric scale. *Computers in Human Behavior*, 45, 137–143. <https://doi.org/10.1016/j.chb.2014.12.006>
- Potenza, M. N. (2006). Should addictive disorders include non-substance-related conditions? *Addiction*, 101(Suppl. 1), 142–151. <https://doi.org/10.1111/j.1360-0443.2006.01591.x>
- Rankin, R. M., Read, P. A., Walker, B. R., & Rankin, P. M. (2021). Other directedness and impaired limits: The impact of early maladaptive schema on exercise dependence. *Current Psychology*, 40(5), 2161–2173. <https://doi.org/10.1007/s12144-019-0139-1>
- Schluter, M. G., Hodgins, D. C., Wolfe, J., & Wild, T. C. (2018). Can one simple questionnaire assess substance-related and behavioural addiction problems? Results of a proposed new screener for community epidemiology. *Addiction*, 113(8), 1528–1537. <https://doi.org/10.1111/add.14166>
- Schmidt, N. B., Joiner, T. E., Young, J. E., & Telch, M. J. (1995). The Schema questionnaire: Investigation of psychometric properties and the hierarchical structure of a measure of maladaptive schemas. *Cognitive Therapy and Research*, 19(3), 295–321. <https://doi.org/10.1007/BF02230402>
- Sempértégui, G. A., Karreman, A., Arntz, A., & Bekker, M. H. (2013). Schema therapy for borderline personality disorder: A comprehensive review of its empirical foundations, effectiveness and implementation possibilities. *Clinical Psychology Review*, 33(3), 426–447. <https://doi.org/10.1016/j.cpr.2012.11.006>
- Shajari, F., Sohrabi, F., & Jomehri, F. (2016). Relationship between early maladaptive schema and internet addiction: A cross-sectional study. *Asian Journal of Pharmaceutical Research and Health Care*, 8(3), 84–91. <https://doi.org/10.18311/ajphrc/2016/4334>
- Shorey, R. C., Anderson, S., & Stuart, G. L. (2012b). Gambling and early maladaptive schemas in a treatment-seeking sample of male alcohol users. *Addictive Disorders & Their Treatment*, 11(4), 173–182. <https://doi.org/10.1097/ADT.0b013e31823eda8f>
- Shorey, R. C., Anderson, S. E., & Stuart, G. L. (2012a). Gender differences in early maladaptive schemas in a treatment-seeking sample of alcohol-dependent adults. *Substance Use & Misuse*, 47(1), 108–116. <https://doi.org/10.3109/10826084.2011.629706>
- Shorey, R. C., Stuart, G. L., & Anderson, S. (2012). The early maladaptive schemas of an opioid-dependent sample of treatment seeking young adults: A descriptive investigation. *Journal of Substance Abuse Treatment*, 42(3), 271–278. <https://doi.org/10.1016/j.jsat.2011.08.004>

- Shorey, R. C., Stuart, G. L., & Anderson, S. (2013). Differences in early maladaptive schemas in a sample of alcohol and opioid dependent women: Do schemas vary across disorders? *Addiction Research & Theory*, *21*(2), 132–140. <https://doi.org/10.3109/16066359.2012.703266>
- Siddaway, A. P., Wood, A. M., & Hedges, L. V. (2019). How to do a systematic review: A best practice guide for conducting and reporting narrative reviews, meta-analyses, and meta-syntheses. *Annual Review of Psychology*, *70*, 747–770. <https://doi.org/10.1146/annurev-psych-010418-102803>
- Starcevic, V., & Khazaal, Y. (2017). Relationships between behavioural addictions and psychiatric disorders: What is known and what is yet to be learned? *Frontiers in Psychiatry*, *8*, 53. <https://doi.org/10.3389/fpsy.2017.00053>
- Stevens, M. W., Dorstyn, D., Delfabbro, P. H., & King, D. L. (2021). Global prevalence of gaming disorder: A systematic review and meta-analysis. *The Australian and New Zealand Journal of Psychiatry*, *55*(6), 553–568. <https://doi.org/10.1177/0004867420962851>
- Wang, W., Zhou, D. D., Ai, M., Chen, X. R., Lv, Z., Huang, Y., & Kuang, L. (2019). Internet addiction and poor quality of life are significantly associated with suicidal ideation of senior high school students in Chongqing, China. *PeerJ*, *7*, Article e7357. <https://doi.org/10.7717/peerj.7357>
- Young, J., & Brown, G. (2003). *Young schema questionnaire*. Sarasota, FL: Professional Resource Exchange.
- Young, J., Klosko, J., & Weishaar, M. (2003). *Schema therapy: A practitioner's guide*. Guilford Press.
- Young, J. E., & Brown, G. (2005). *Young schema questionnaire-short form; version 3 (YSQ-S3, YSQ)* [database record]. APA PsycTests. <https://doi.org/10.1037/t67023-000>
- Young, K. S. (1998). Internet addiction: The emergence of a new clinical disorder. *Cyberpsychology & Behavior*, *1*(3), 237–244. <https://doi.org/10.1089/cpb.1998.1.237>
- Zeeck, A., Stelzer, N., Linster, H. W., Joos, A., & Hartmann, A. (2011). Emotion and eating in binge eating disorder and obesity. *European Eating Disorders Review*, *19*(5), 426–437. <https://doi.org/10.1002/erv.1066>
- Zhu, H., Luo, X., Cai, T., He, J., Lu, Y., & Wu, S. (2016). Life event stress and binge eating among adolescents: The roles of early maladaptive schemas and impulsivity. *Stress and Health*, *32*(4), 395–401. <https://doi.org/10.1002/smi.2634>