



AKADÉMIAI KIADÓ

Treatment for the concerned significant others of gamblers: A systematic review

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REVIEW ARTICLE



ABSTRACT

Background and aims: Research recognizes the extent of harm experienced by concerned significant others (CSOs) of gamblers. This systematic review's aims are to examine the interventions for CSOs, evaluate potential benefits, and thematically describe treatment processes. The Stress-Strain-Coping-Support model (SSCS) served as the theoretical framework. *Methods:* Database searches were conducted in: MEDLINE, CINAHL Complete, Web of Science Core Collection, Social Services Abstracts, Applied Social Science Index and Abstracts, Cochrane Central Register of Controlled Trials, and APA PsycInfo (between 01/Jan 2011–10/Jun 2021). Other search methods were also utilized. Inclusion criteria: interventions for CSOs with CSO specific outcomes. The Evidence Project Risk of Bias Tool was used for assessment. *Results:* 19/768 records were included. Nine interventions were utilized: 3 CSO directed, 4 for couples, and 2 low threshold online interventions. A quantitative synthesis ($N = 7$ studies) of effect size estimates for depression and anxiety measures didn't indicate any intervention to have better outcomes than others. Core themes in the treatment process identified in the qualitative synthesis ($N = 7$) included: information and understanding, social support, coping skills, communication, and strain. Limitations in the evidence related to sampling, control-conditions and outcome measurements. *Discussion and conclusion:* Several interventions were identified, yet no specific interventions appeared more beneficial than others. Using the SSCS model, commonalities and differences in intervention content were identified, along with themes that influence treatment processes. The need for tailored interventions is discussed. Future treatment efficacy research should carefully select study designs and outcome measurements. PROSPERO (CRD42021229408).

KEYWORDS

systematic review, problem gambling, concerned significant others, treatment, intervention, synthesis

INTRODUCTION

Problem gambling (PG) has a negative impact on the gambler, concerned significant others (CSOs) and society at large (Goodwin, Browne, Rockloff, & Rose, 2017; Kalischuk, Nowatzki, Cardwell, Klein, & Solowoniuk, 2006; Langham et al., 2016). The prevalence of CSOs and the types of harm they experience is an area of research receiving an increasing amount of attention, with prevalence estimates varying from 2% to 19%, depending on the methods used for estimation (Hing et al., 2021; Salonen, Castrén, Alho, & Lahti, 2014, 2016, 2018; Svensson, Romild, & Shepherdson, 2013; Wenzel, Øren, & Bakken, 2008).

There are a multitude of types of harm experienced by the CSOs of individuals experiencing gambling problems including, financial concerns, emotional, health, work and study

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harm, as well as relationship conflicts (Blaszczynski, Swanton, & Gainsbury, 2020; Goodwin et al., 2017; Langham et al., 2016; Salonen, Alho, & Castrén, 2016, 2020). To elucidate, experiencing gambling debt in the family and bailing out debts often leads to financial hardship, anxiety and deterioration of relationships among family members (Downs & Woolrych, 2010; Jeffrey et al., 2019; Li, Browne, Rawat, Langham, & Rockloff, 2017; McComb, Lee, & Sprenkle, 2009). The emotional and health related harm may also, for instance, entail depression, insomnia and headaches (Jeffrey et al., 2019; Li et al., 2017; Patford, 2009). Furthermore, the social harm experienced may include child neglect and intimate partner violence perpetration and victimization, while work related harm may entail absenteeism from work (Dowling et al., 2016; Hing et al., 2020). It is also noteworthy that the harm experienced by CSOs, such as social isolation and psychological distress, may continue to impact their well-being long after the gambling behavior has ceased (Langham et al., 2016).

The aforementioned diversity of harms highlights the need for interventions directed towards CSOs (Kalischuk et al., 2006; Kourgiantakis, Saint-Jacques, & Tremblay, 2013). CSOs are in need of a wide range of guidance, for instance knowledge about problem gambling, how to cope with the harm experienced, and the means of supporting an individual with a gambling problem (Bond et al., 2016; Landon, Grayson, & Roberts, 2018), and these services need to be provided in an evidence-based manner.

Previous reviews of CSO interventions

Despite acknowledgment of the plight experienced by CSOs of individuals experiencing gambling problems, research on interventions has displayed shortcomings (Kalischuk et al., 2006; Kourgiantakis et al., 2013). Prior reviews indicate that the majority of interventions available for CSOs are adaptations of treatments developed in other fields of addiction, and these interventions often maintain a focus centered around the gambler rather than providing treatment to the CSO in their own right (Kalischuk et al., 2006; Kourgiantakis et al., 2013). Both reviews nonetheless conclude that addressing coping skills with family members is a promising approach (Kalischuk et al., 2006; Kourgiantakis et al., 2013). Furthermore, Kourgiantakis et al. (2016) concluded that no studies have assessed prevention programs directed towards the children of parents experiencing gambling problems.

Kourgiantakis et al. (2013) systematic review covered the years 1998–2013 and identified 8 studies that assessed family involvement in the treatment of PG. Four of these studies (Hodgins, Shead, & Makarchuk, 2007; Hodgins, Toneatto, Makarchuk, Skinner, & Vincent, 2007; Makarchuk, Hodgins, & Peden, 2002; Peden, 2011), utilized adaptations of the Community Reinforcement and Family Training (CRAFT) intervention (Meyers, Miller, Hill, & Tonigan, 1998; Miller, Meyers, & Hiller-Sturmhöfel, 2003), and evaluated the effects of teaching coping skills to CSOs. One study evaluated a Coping Skill Training (CST) program (Rychtarik & McGillicuddy, 2006). Additionally, two studies examined the

efficacy of Congruence Couples Therapy (CCT) (Lee, 2002; Lee & Rovers, 2008) and one study (Ingle, Marotta, McMillan, & Wisdom, 2008) evaluated the effects of family involvement on PG treatment outcome.

More recently, reviews concerning interventions directed towards CSOs of individuals with variable addictions have been published (Archer, Harwood, Stevelink, Rafferty, & Greenberg, 2020; Kourgiantakis, Ashcroft, Mohamud, Fearing, & Sanders, 2021; Merkouris, Dowling, & Rodda, 2020). A systematic review evaluating CRAFT interventions for several addictions (Archer et al., 2020) identified 3 gambling studies (Hodgins, Toneatto, et al., 2007; Makarchuk et al., 2002; Nayoski & Hodgins, 2016) where noteworthy observations were made, highlighting the difficulties and potential pitfalls of adapting treatments developed for other addictions to the gambling context where certain unique characteristics of gambling may be inadequately taken into account or important elements of treatment may be left out. Furthermore, a recent scoping review of family focused interventions in addiction treatment (including alcohol, drugs and gambling) (Kourgiantakis et al., 2021) concluded that more theory-driven research needs to be conducted, with a larger focus on harm reduction, and that there are still a lack of interventions directed specifically towards CSOs. Lastly, a recent systematic review and meta-analysis (Merkouris et al., 2020) utilizing studies evaluating intervention effectiveness for CSOs affected by problematic alcohol use, substance use and gambling concluded that the most consistent evidence was available for CRAFT, identifying beneficial treatment effects for depressive symptomatology, coping, treatment entry of an individual with an addiction, and relationship discord with effect size estimates ranging from medium to large (Merkouris et al., 2020). However, as only 7/40 of the included studies concerned CSOs of gamblers, the majority of this evidence is based on studies related to CSOs affected by problematic alcohol and substance use (Merkouris et al., 2020). The present systematic review adds to this growing literature base evaluating interventions for CSOs by incorporating quantitative and qualitative studies of all types, including unpublished literature, and by maintaining a focus specifically on interventions for the CSOs of gamblers.

Theoretical framework

In order to coherently and systematically appraise available treatments, a common framework is instrumental. The stress-strain-coping-support model (SSCS) (Orford, Copello, Velleman, & Templeton, 2010) provides a suitable conceptual framework for understanding how CSOs may be supported. Essentially the SSCS model postulates that being the CSO of an individual with an addiction is highly stressful, with detrimental consequences to health and well-being (i.e., strain) (Orford, Copello, et al., 2010). Importantly, the SSCS model promotes agency for CSOs (Orford, Copello, et al., 2010). According to the model, the degree of strain experienced is influenced by the availability and access to 3 partially overlapping resources: coping skills, social support, and



information and understanding (Orford, Velleman, Copello, Templeton, & Ibanga, 2010; Orford, Velleman, Natera, Templeton, & Copello, 2013; Orford, Copello, et al., 2010), where the inclusion of information and understanding was put forth in the more recent work (Orford et al., 2013).

Aims of the systematic review

Since the systematic review by Kourgiantakis et al. (2013), important developments have been made within the PG research, including a better comprehension of the wide spectrum of gambling related harm, and thus it is timely to provide an update.

The aims of this systematic review are to provide an updated overview of available studies concerning interventions directed towards CSOs of individuals experiencing gambling problems (1), provide a description of the interventions' content (2), to evaluate the benefits of these interventions (3), and to provide a thematic description of treatment processes (4). Overarching goals include the generation of knowledge for clinicians on supporting the well-being of CSOs, and to inform the development of CSO interventions and research.

METHOD

The present systematic review followed the PRISMA 2020 statement and guidelines (Page, McKenzie, et al., 2021; Page, Moher, et al., 2021). The protocol was registered to PROSPERO (CRD42021229408).

Search strategy and timing of searches

Searches covered the years 2011–2021 using the work by Kourgiantakis et al. (2013) as a starting point; here 2011 was included to account for the possible gap (2011–2012) with the previous systematic review. Searches were conducted by author PP.

The databases used were: MEDLINE (Ovid), CINAHL Complete (EbscoHost), the Web of Science Core Collection, Social Services Abstracts (ProQuest), the Applied Social Science Index and Abstracts (ProQuest) (January 22, 2021), the Cochrane Central Register of Controlled Trials (Wiley Cochrane Library) (January 26, 2021), and APA PsycInfo (OVID) (March 12, 2021).

Grey literature was sought by contacting authors of included studies and experts in the field ($n = 32$) by email between April and June of 2021. Grey literature was also sought on Google Scholar and the EBSCO Discovery Service (29–30.3.2021). The Google Scholar search was conducted for titles only, using a limited set of keywords. The EBSCO Discovery Service search results were limited to reports, conference materials, dissertations and electronic resources. Limitations to the Google Scholar and EBSCO Discovery Service searches were influenced by resource limitations and considered justified on account of the extensive international network of experts in the field that were contacted.

Furthermore, reference lists of included reports were manually screened by two reviewers independently (RE, SC, SR).

Search terms for population included *gambler(s)* and *gambling* combined with terms for significant others, e.g., *significant other(s)*, *family*, *spouse(s)*, *child*, *friend(s)* and *colleague*. Search terms for interventions included, e.g., *Community Reinforcement and Family Training* and *Congruence Couple Therapy*, and general terms related to interventions or evaluations of interventions, e.g., *intervention(s)*, *counseling*, *self-help*, *outcome assessment*, *evaluation study*, and *feasibility study*. See [Supplementary material 1 \(osf.io/hr7s6/\)](https://osf.io/hr7s6/) for the full search strategy. Searches were limited to articles published in English. The search strategy was constructed to filter out articles including terms for *gambling tasks* and *Parkinson's disease*, but not terms for *gamblers* or *problem gambling*. This decision was based on prior experience of similar searches and was tested thoroughly for performance.

In order to identify new or newly indexed studies, we updated the database searches on June 9–10, 2021. Search alerts for all databases were created utilizing original search strategies (without the limit for gambling tasks and Parkinson's disease).

Reference management and deduplication

The search results were exported into RefWorks (Legacy) for deduplication. Deduplication was performed using the RefWorks deduplication function and manually.

Selection process

For inclusion, records/reports needed to be related to gambling (1), include an intervention assessment (2), report a CSO-related outcome (3) and be written in English (4). In addition to peer reviewed articles, thesis papers and unpublished research manuscripts were eligible. See the flow diagram for a depiction of the selection process (Fig. 1). Double screening by independent duplicate checking was conducted (RE, SC, SR) for screening of all records and full-text report assessments. All disagreements were resolved by discussion. If record screening could not be done based on the information provided in the abstract, the full text was reviewed.

Data extraction

Data was extracted by a single author (RE), and 30% of the studies' data were double checked (SR). The selection of relevant information for extraction was informed by the taxonomy for intervention characteristics designed for psychological PG interventions (Rodda et al., 2018). During the process of extracting information on intervention content, various sources were utilized in addition to the included reports.

Researchers were contacted by email and requested to provide additional information in 3 instances (Lee & Awo-soga, 2015; Nayoski & Hodgins, 2016; Nilsson, Magnusson, Carlbring, Andersson, & Hellner, 2020). All information was



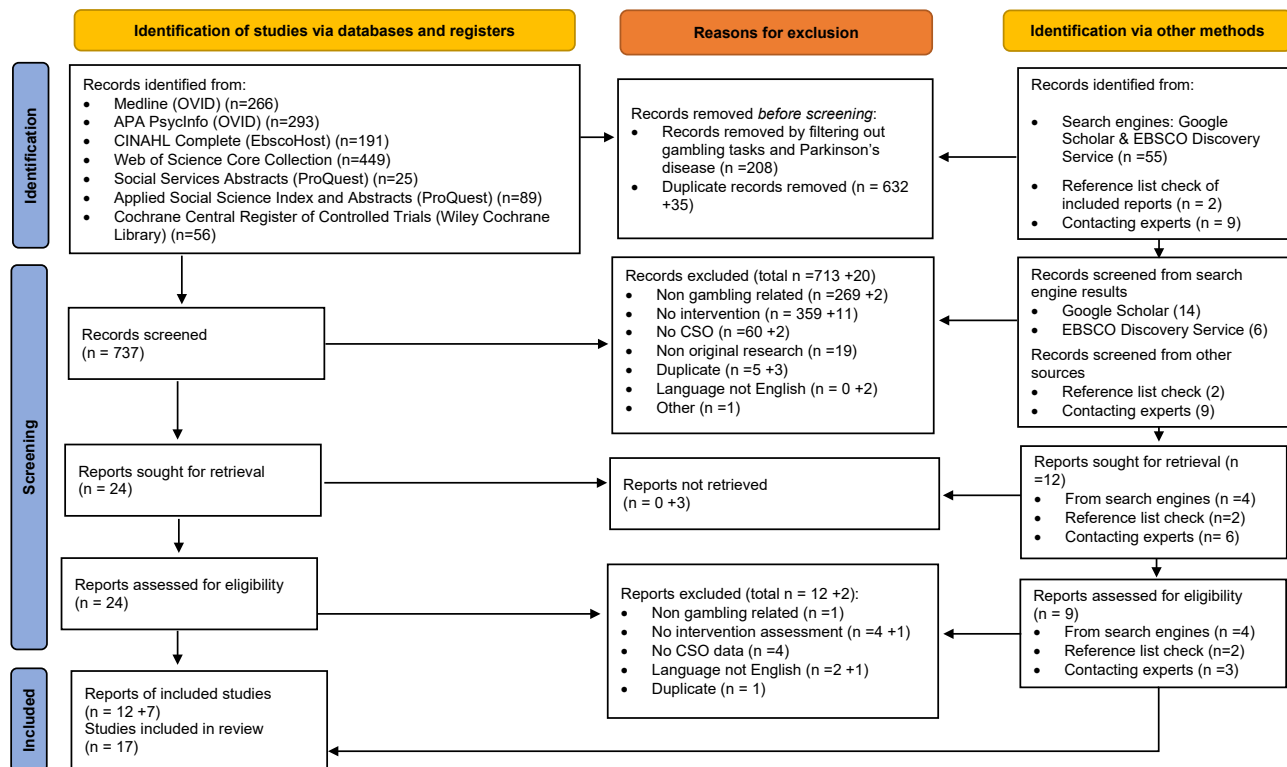


Fig. 1. Flow diagram of study selection process. Adapted from the PRISMA 2020 statement (Page, McKenzie, et al., 2021; Page, Moher, et al., 2021). Numbers reported after “+” sign refer to excluded records and reports identified via other methods. Full database-specific search strategies, procedure for contacting experts, details on exclusion and inclusion criteria, and noteworthy exclusions are available in the online Supplementary material 1. (osf.io/hr7s6/). Abstract and full text appraisal guidelines are available in the online Supplementary material 3. (osf.io/hr7s6/)

obtained successfully. The study data by Nilsson, Magnusson, Carlbring, Andersson, and Gumpert (2018) was prepared for presentation using an algebraic manipulation which converted the reported confidence intervals of outcome measures into standard deviations.

Risk of bias assessment

The risk of bias was assessed by two reviewers independently (RE, SC, SR) utilizing the Evidence Project Risk of Bias Tool (Kennedy et al., 2019). Disagreements were settled by discussion. The risk of bias tool was tested on a subset of four articles by three authors, after which amendments were made to the guidelines. The initial inter-rater agreement of the final assessment was 87.5%. Supplementary analyses were conducted to confirm equivalence of comparison groups on socio-demographics and baseline outcomes with *t*-tests and chi-square tests in three instances (Lee & Awo-soga, 2015; Magnusson, Nilsson, Andersson, Hellner, & Carlbring, 2019; Nilsson et al., 2020).

Data synthesis

The terms used to describe the intervention content were tabulated and organized according to the SSCS model's three concepts: information and understanding, coping skills, and social support. During this extraction process a new category for communication skills was created, because this was central

to interventions. An additional “Other” category was used for intervention content that did not fit into previously defined categories. Subsequently the list of intervention content items was condensed by merging terms referring to the same concepts (e.g., positive reinforcement and reinforcing non-gambling behavior) and creating superordinate concepts where appropriate (e.g., “Additional psychoeducation” referring to several forms of psychoeducation other than content directly related to gambling and problem gambling).

The intervention content checklist created (RE) was then utilized to record the intervention content (present or not) across the various interventions included in the review. SC independently filled the content checklist for 5/9 of the interventions. The initial interrater agreement was 78%. Disagreements were resolved by discussion.

The methodological decisions for the syntheses of quantitative and qualitative studies were made based on the quality of the extracted data. The most commonly used quantitative outcome measures and time points of data collection across the studies informed the decision making. Effect size estimates (unbiased Hedge's *g*) were calculated for studies reporting mean differences between treatment arms ($n = 6$). For the remaining study (Orford, Cousins, Smith, & Bowden-Jones, 2017) with a within-subject design, the effect size was calculated with the unbiased estimate of the mean difference. All the effect size calculations were conducted manually in Microsoft Excel (Excel 2016).



For the qualitative synthesis, commonalities in the research questions guided the grouping of the studies. This approach formed two groups: treatment studies ($n = 7$) and low threshold online interventions ($n = 3$).

The qualitative synthesis of reports concerned with the treatment process was approached by systematically extracting text from the reports (from the results and discussion sections) which referred to the treatment processes. This phase mimicked the data extraction of meta-ethnography (France et al., 2019), and included extracting second order constructs (i.e., descriptions and interpretations by study authors; quotations from participants were not extracted). The extracted texts were categorized according to the elements of the SSCS model, first within studies, and then across studies. A category for *communication* was also utilized, and further categories created throughout the process as needed. Data extraction and categorization was conducted (RE) using Microsoft Word (Word 2016). For 3/7 reports, the extracted data was double-checked (SC). For 4/7 reports, the texts were independently categorized by a second author (SC). Disagreements were resolved by discussions. See online [Supplementary material 2 \(osf.io/hr7s6/\)](https://osf.io/hr7s6/) for further details on the syntheses processes.

For the remaining 3 studies no unified synthesis was utilized due to variable research questions and study designs. In one case (Rodda, Lubman, Dowling, & McCann, 2013), the previously described qualitative synthesis was applied. For the remaining two studies (Buchner, Koytek, Wodarz, & Wolstein, 2019; Rodda, Lubman, & Dowling, 2017) the findings were narratively summarized.

Ethics

APA ethical standards were followed in the conduct of the study.

RESULTS

In accordance with the aims of the systematic review, the results are presented in the following manner. First, an overview of the selected studies is provided (1) and followed by descriptions of each intervention (2). Subsequently the quantitative synthesis assesses the potential benefits of the interventions (3), followed by the qualitative synthesis presenting thematic descriptions of treatment processes (4). The Results section ends with narrative descriptions of the low threshold online intervention studies.

Results of the selection process

Database searches yielded 1,369 search results in total. After duplicate removal, 757 titles and abstracts were screened. See Fig. 1 for the flow diagram of the article selection process, which also details the reasons why records and reports were excluded. From the database search results, 12/24 reports were included. One report (Peden, 2011) was included in a review by Kourgiantakis et al. (2013), but was retained

because a more recent report based on the same study (Nayoski & Hodgins, 2016) was also identified.

Regarding the search via other methods, the search engine searches (including Google Scholar and EBSCO Discovery Services) yielded 55 results. After duplicate removal, 20 records identified via search engines were screened, followed by the screening of 4 full reports, and the inclusion of 2 reports. The reference list check yielded an additional 2 reports (Kourgiantakis, 2017; Rodda et al., 2013). Contacting study authors and experts brought us 9 records. Out of these, 6 were eligible but 3 were not retrieved: 2 CCT reports undergoing review, and unpublished data (5-step method) (B. Lee, personal communication, 15th June 2021; R. Velleman, personal communication, 14th May 2021). Thus, 3 unpublished studies (Bastardo Gaelzer, 2019; Nilsson, 2020; Shi, 2021) were included as a result of contacting experts.

In sum, 19 reports were included in the review. 2 PhD theses (Nilsson, 2019; Peden, 2011) were merged with reports based on the same studies, totaling 17 studies.

The result of the search update (not shown in Fig. 1) came to 71 references, and all of these records were already identified in the original search. After the completion of the systematic review, the publication alerts set for the databases identified 2 relevant records (last update 19.11.2021). Namely, a previously unpublished manuscript by Nilsson (2020) was published (Nilsson, Simonsson, & Hellner, 2021). Additionally, 1 new record was identified (Marionneau & Järvinen-Tassopoulos, 2021) which dealt with how gamblers and CSOs had experienced changes in services as a consequence of the COVID-19 pandemic; this article however was not deemed eligible due to the primary focus being the effects of the pandemic. However, it is worthy to mention that study participants had often reported that the low threshold of access to online services was a positive development that ought to be maintained after the pandemic eases (Marionneau & Järvinen-Tassopoulos, 2021).

Overview of study characteristics

Geographically studies were conducted in Canada ($n = 9$), Sweden ($n = 4$), Australia ($n = 2$) and one in England and Germany. For the majority of studies ($n = 12$) research was conducted during the year 2015 or earlier. More recently conducted research (2015–2020) originated from Sweden ($n = 4$) and Canada (Shi, 2021). 4/9 interventions were online interventions (online Cognitive Behavioral Therapy (CBT), Behavioral Couples Therapy (BCT), Efa (Verspiel nicht mein Leben – Entlastung für Angehörige; Eng. “Don’t gamble away my life – Support for Affected Others”) & Gambling help online (GHO)). 5/9 interventions were directed at CSOs alone (CRAFT, online CBT, 5-step method, Efa, GHO), and 4 were directed towards couples/dyads (BCT, CCT, Integrative Couple Treatment for Pathological Gambling [ICT-PG], and standard treatment).

5 studies were RCTs (Lee & Awosoga, 2015; Magnusson et al., 2019; Nayoski & Hodgins, 2016; Nilsson et al., 2018, 2020), 4 were case studies (Bastardo Gaelzer, 2019; Lee, 2012, 2015; Shi, 2021), 2 were explorative surveys (Rodda



et al., 2013, 2017), and 2 were based on post-treatment/follow-up interviews (Nilsson, 2020; Tremblay et al., 2018). One study (2 reports) utilized a mixed method approach (Kourgiantakis, 2017; Kourgiantakis, Saint-Jacques, & Tremblay, 2018), one utilized within-subject quantitative data (Orford et al., 2017), and one was a feasibility study (Buchner et al., 2019).

Overall, the studies included 808 participants. The participants were predominantly females (83.9%). 47% of participants were partners of gamblers, 23% were parents, about 5% consisted of adult children, siblings and friends and for 25% the relationship was undefined. In Table 1 the study characteristics are presented.

Risk of bias of included studies

Table 2 presents the risk of bias assessments for all the studies in three categories, quantitative ($n = 7$), qualitative ($n = 7$) and low threshold online interventions ($n = 3$). The assessments are based on the study design (cohort, control group, data collection, participant assignment to group), sampling, follow-up rate (i.e., retention) and comparison of the group equivalence concerning demographics and baseline outcomes.

Description of included studies and interventions

The following section describes all the included studies, the interventions utilized, and the results pertinent to intervention evaluation. See Table 3 for the CSO intervention content checklist.

CRAFT: *Nayoski & Hodgins, 2016; Peden, 2011.* The CRAFT intervention (Makarchuk et al., 2002) provides psychoeducation, and supports CSOs in using adaptive coping strategies. When dealing with gambling, coping strategies are categorized as either reinforcing gambling behavior or reinforcing non-gambling behavior. Coping is supported by utilizing a functional analysis. Information on what to do in case of domestic violence was included, as well as guidance on how to encourage the gambler to enter treatment.

Online CBT: *Magnusson et al., 2019.* CRAFT-based online CBT (Makarchuk et al., 2002) provides psychoeducation about gambling and protecting the economy of the CSO. Coping is approached through reinforcement strategies, and improving well-being is encouraged through self-care. Inviting the gambler into treatment is also included. Principles from Motivational Interviewing are used in communication skills training. Some of the treatment content (e.g., reconnecting with values) were interpreted to represent “self-care” and reinforcement strategies.

5-Step method: *Orford et al., 2017.* The 5-step method places emphasis on devoting time for CSOs to tell their stories, and to be heard and not judged. The method has a unique approach to coping skills, aiming to help CSOs make informed decisions on coping with conflicting feelings

(opposed to teaching predetermined coping skills). Additionally, “future planning” by discussing further needs and facilitating contact with services is included.

The method (Copello, Templeton, Orford, & Velleman, 2010), consists of 5 modules that can be covered over 5 (or fewer) sessions: (1) listen, reassure and explore concerns; (2) provide relevant, specific, and targeted information; (3) explore coping responses; (4–5) discuss: social support, and explore further needs.

“Standard treatment”: *Kourgiantakis et al., 2018; Kourgiantakis, 2017.* The treatment content was variable, such that CSOs could attend individual and family psychoeducational-support group sessions. The treatment content was described briefly to cover psychoeducation, social support, and learning of communication and coping skills.

Standard treatment was relatively strong in providing information, focused on social support, and addressed coping skills moderately along with communication.

BCT: *Nilsson et al., 2018, 2020, 2021.* Online Behavioral Couples Therapy (BCT) consisted of 2 studies documented in 3 reports: 1 pilot RCT report (Nilsson et al., 2018), 1 RCT report (Nilsson et al., 2020) and 1 qualitative study (Nilsson et al., 2021).

The BCT modules contained text, images, short films and exercises. Additionally, the participants had access to moderated forums for peer support. BCT provided psychoeducation on financial recovery. Coping skills training was approached through functional analysis and reinforcing non-gambling. BCT provides treatment for the gambler. BCT moderately addressed information, and focused on social support and targeting coping skills enhancement.

CCT: *Bastardo Gaelzer, 2019; Lee, 2012, 2015; Lee & Awosoga, 2015; Shi, 2021.* CCT was investigated in 5 reports. Two case study reports documented the treatment process (Lee, 2012, 2015). Two reports (1 quantitative and 1 qualitative) dealt with a multisite 2-parallel pilot RCT (Bastardo Gaelzer, 2019; Lee & Awosoga, 2015), and one qualitative report related to an unpublished RCT (Shi, 2021).

CCT aims to develop mutual support via increased mutual comprehension. CCT has a strong focus on communication skills training for couples. CCT provides a high level of therapeutic contact and utilizes the participants’ personal narratives in treatment. CCT does not explicitly incorporate coping skills training into the treatment and places a strong emphasis on understanding the self and other. CCT presumes recovery to take place through 5 recursive circuits (see Table 1. Study characteristics).

ICT-PG: *Tremblay et al., 2018.* ICT-PG is a couples intervention that aims to develop mutual support via increased mutual comprehension and increased shared enjoyable activities (Tremblay et al., 2015). Communication skills training is essential, and coping skills are approached through avoiding the reinforcement of gambling and encouraging the reinforcement of non-gambling. ICT-PG provides treatment to the gambler in the presence of the



Table 1. Study characteristics

Author (year); Country	Study design; Data collection	CSO sample size (total); Sampling method; Context; Inclusion/exclusion criteria	Treatment arm; Treatment length; Control arm	Clinician qualifications; Training; Supervision; Integrity; Manual	Main findings for treatment process and efficacy
Studies in quantitative synthesis					
Peden (2011)/Nayoski and Hodgins (2016); Canada	<ul style="list-style-type: none"> • 2-parallel RCT • Baseline, post-treatment and 3 month follow-up 	<ul style="list-style-type: none"> • $N = 31$ • Purposive sampling • 90% non-clinical context • Inclusion: age ≥ 18, CSO has minimum 3 days week contact with gambler, CSO is close relative or partner of gambler, gambler resistant to treatment, gambler scores ≥ 4 on DSM-IV; • Exclusion: CSO or gambler has attended gambling related treatment in the 2 months prior to screening, CSO does not have gambling problem (CPGI score = 0), participation in study poses elevated risk of possible abuse 	<ul style="list-style-type: none"> • CRAFT individual treatment • length 8 modules (8–12 sessions) • Control arm: CRAFT self-help workbook 	<ul style="list-style-type: none"> • 4 master-level therapists; • Therapists received 6h training session • Weekly supervision provided by CBT clinical psychologist who reviewed tape-recorded sessions and provided feedback; • Therapist integrity checklist were used • Manualized, based on CRAFT 	<ul style="list-style-type: none"> • There was no group difference for gambler treatment entry. • There were no significant group differences for mental health or relationship satisfaction outcomes. • Effect sizes indicated that individual treatment may be more beneficial than workbook but this needs to be interpreted with caution.
Magnusson et al. (2019); Sweden	<ul style="list-style-type: none"> • 2-parallel RCT • Baseline, post-treatment, 3, 6, 12 month follow up 	<ul style="list-style-type: none"> • $N = 100$; • Purposive sampling • Non-clinical • Inclusion: PGSI score ≥ 8 for gambler rated by CSO, age ≥ 18, gambler is unwilling to start treatment; Inclusion: CSO and gambler known each other for at least 3 months, literate in Swedish, psychotropic medication has been stable for at least 3 months; • Exclusion: No treatment related to gambling in past 3 months (for CSO or gambler), CSO has PGSI score ≥ 8; psychotic or bipolar disorder (for CSO or gambler) 	<ul style="list-style-type: none"> • Online CBT • 9 modules (10 weeks) • Control: waitlist (only baseline and post-treatment measurements) 	<ul style="list-style-type: none"> • Counselors trained in motivational interviewing ($n = 3$), and master-level clinical psychologist ($n = 1$) • Training: NR • Weekly supervision by 2 of study authors • Integrity: NR • Manualized, based on CRAFT and CBT 	<ul style="list-style-type: none"> • Online CBT improved psychological well-being compared to waitlist control in terms of emotional consequences, relationship satisfaction, anxiety and depression. • Intervention effects on PG treatment seeking and gambling outcomes were small and inconclusive.

(continued)



**Table 1. Continued**

Author (year); Country	Study design; Data collection	CSO sample size (total); Sampling method; Context; Inclusion/exclusion criteria	Treatment arm; Treatment length; Control arm	Clinician qualifications; Training; Supervision; Integrity; Manual	Main findings for treatment process and efficacy
Nilsson et al. (2018); Sweden	<ul style="list-style-type: none"> • 2-parallel pilot RCT • Baseline, post-treatment, 3, 6 month follow-up 	<ul style="list-style-type: none"> • $N = 18$ (36); • Purposive sampling • Recruitment both non-clinical and clinical • Inclusion: PGSI score ≥ 8 for gambler, age ≥ 18, CSO and gambler known each other for at least 3 months, lives in Sweden, literate in Swedish; • Exclusion: CSO has PGSI score ≥ 8; symptoms of severe psychiatric disorder 	<ul style="list-style-type: none"> • Online BCT (for gambler and CSO separately) • 10 modules (10–12 weeks) • Control: CSOs waitlist, CBT for gambler; CBT content mirrored the BCT treatment content for gamblers 	<ul style="list-style-type: none"> • Master-level clinical psychology students and experienced counsellors with MI training; • Training in study manual and Internet-delivered therapy; • Bi-weekly supervision by experienced CBT therapist; • Integrity: NR • Manualized 	<ul style="list-style-type: none"> • Treatment group CSOs showed improvement in depression and anxiety which was maintained at 6 months follow-up. • Findings suggest having CSO in treatment may improve treatment engagement of gambler.
Nilsson et al. (2020); Sweden	<ul style="list-style-type: none"> • 2-parallel RCT • Baseline, post-treatment, 3, 6, 12 month follow-up 	<ul style="list-style-type: none"> • $N = 68$ (136); • Purposive sampling • Recruitment both non-clinical and clinical • Inclusion: PGSI score ≥ 8 for gambler, age ≥ 18, CSO and PG known each other for at least 3 months, lives in Sweden, literate in Swedish; • Exclusion: CSO has PGSI score ≥ 8, symptoms of severe psychiatric disorder; simultaneous participation in other PG treatment 	<ul style="list-style-type: none"> • Online BCT (for gambler and CSO separately) • 10 modules (10–12 weeks); • Control: CSOs waitlist, CBT for gambler; CBT content mirrored the BCT treatment content for gamblers 	<ul style="list-style-type: none"> • Master-level clinical psychology students and experienced counsellors with MI training; • Training in study manual and Internet-delivered therapy; • Bi-weekly supervision by experienced CBT therapist • Integrity: NR • Manualized 	<ul style="list-style-type: none"> • More gamblers in CBT group completed less than 2 modules than gamblers in BCT group, suggesting CSO involvement may improve adherence. • There was minimal benefit for CSOs by taking part in treatment.
Lee and Awosoga (2015); Canada	<ul style="list-style-type: none"> • Multi-site pilot RCT • Baseline, post-treatment, 2 month follow-up 	<ul style="list-style-type: none"> • $N = 15$ (30) • Purposive sampling • Recruitment 70% non-clinical and 30% clinical • Inclusion: age ≥ 18; one or both spouses DSM-IV-TR score ≥ 5, has gambled in past 2 months, committed couple relationship (self-definition); 	<ul style="list-style-type: none"> • CCT • Gambler and CSO participate in joint treatment • 12 sessions; 12 weeks • Control: No treatment or variable TAU (including group counselling, individual counselling, couple counselling ($n = 1$, not CCT)) 	<ul style="list-style-type: none"> • Counsellors experienced with PG treatment; • Training program (3 days) prior to study • Supervision: NR • Integrity rated by trained observers of videotaped CCT sessions using "Stages of CCT" interventions checklist • Manualized 	<ul style="list-style-type: none"> • Significant improvement was evident for mental distress and family systems functioning between treatment and control groups in favor of treatment group. Within group improvement was evident for mental distress, family systems functioning and dyadic adjustment

(continued)

Table 1. Continued

Author (year); Country	Study design; Data collection	CSO sample size (total); Sampling method; Context; Inclusion/exclusion criteria	Treatment arm; Treatment length; Control arm	Clinician qualifications; Training; Supervision; Integrity; Manual	Main findings for treatment process and efficacy
Kourgiantakis (2017)/ Kourgiantakis et al. (2018; part of qualitative synthesis); Canada	<ul style="list-style-type: none"> Mixed method case studies Baseline and post-treatment measurements Semi-structured interviews 3 months after treatment initiation 	<ul style="list-style-type: none"> Exclusion: past month suicidal ideation or attempt, past month psychotic symptoms, recurring intimate partner violence, other treatment during study, involvement with loan sharks $N = 11$ (22) Purposive sampling Clinical context Inclusion: both PG and CSO needed to be involved in treatment; age ≥ 18; PGSI score ≥ 3; Exclusion: symptoms or signs of psychosis, had participated in PG treatment in past year, CSO also had a gambling problem 	<ul style="list-style-type: none"> Individual standard treatment services (for CSO and gambler separately), including family psycho-educational-support group sessions Individual sessions attended $M = 3$, $SD = 2$; Group sessions attended $M = 1$, $SD = 2$ Control: CSO waitlist and standard treatment for gambler 	<ul style="list-style-type: none"> Qualifications: NR Training: NR Supervision: NR Integrity: NR Manual: NR 	<ul style="list-style-type: none"> CSO involvement and quality of involvement in treatment was facilitated by communication, support and coping skills. Barriers to treatment involvement include conflict, isolation, and mental health and/or substance use concerns. Higher CSO involvement was associated with better treatment outcomes and adherence for gamblers.
Orford et al. (2017); England	<ul style="list-style-type: none"> Part of service evaluation project Baseline and follow-up (between 3 and 6 months) surveys 	<ul style="list-style-type: none"> $N = 89-96$ (n varies by questionnaires completed); Purposive sampling Clinical context Inclusion: Having family member with PG, motivation to participate in a study Exclusion: None 	<ul style="list-style-type: none"> 5-step method workbook; potentially monthly educational support groups and when appropriate further interventions e.g. financial management, couples counselling, family therapy Treatment length: NR Control arm: None 	<ul style="list-style-type: none"> Qualifications: NR Training: NR Supervision: NR Integrity: NR 5-step method is manualized 	<ul style="list-style-type: none"> Family burden decreased (including decreased impacts and symptoms experienced and changes in coping strategies used) Formal social support increased at follow-up.

(continued)



**Table 1. Continued**

Author (year); Country	Study design; Data collection	CSO sample size (total); Sampling method; Context; Inclusion/exclusion criteria	Treatment arm; Treatment length; Control arm	Clinician qualifications; Training; Supervision; Integrity; Manual	Main findings for treatment process and efficacy
Studies in qualitative synthesis					
Nilsson (unpublished)/ Nilsson et al., (2021); Sweden	<ul style="list-style-type: none"> Qualitative semi-structured interviews 2–3 years after signing up to RCT (Nilsson et al., 2020) 	<ul style="list-style-type: none"> $N = 8$ Purposive Sampling ($n = 4$ from BCT group; $n = 4$ from control group) See Nilsson et al. (2020) for original sampling context Inclusion: Gambling significant other dropped out of Nilsson et al. (2020) study Exclusion: None 	<ul style="list-style-type: none"> NA (See Nilsson et al., 2020) 	<ul style="list-style-type: none"> NA 	<ul style="list-style-type: none"> Treatment drop-out was influenced by comorbid disorders, relapses, life circumstances, ambivalence and PG itself. The processes influencing drop-out reflect the overarching theme of the unstable path to recovery from PG.
Lee (2012); Canada	<ul style="list-style-type: none"> Case studies Post treatment interviews at 1 & 4 month follow-up 	<ul style="list-style-type: none"> $N = 8$ (16) Purposive sampling Clinical context Inclusion: one of spouses DSM-IV-TR score ≥ 5, gambler must have completed a 12-week cognitive restructuring group program, gambler was abstaining from gambling at the time of the study; Exclusion: history of psychosis 	<ul style="list-style-type: none"> CCT Gambler and CSO participate in joint treatment 12 sessions Control: None 	<ul style="list-style-type: none"> Counselor is registered professional; Training: NR Supervision: NR Sessions were video and audiotaped Manualized 	<ul style="list-style-type: none"> 4 recursive circuits (fault-lines, pressure points, escalation, and relapse) are presented, where external stressors and relationship processes contribute to PG. The recursive inter-relational difficulties are caused, upheld and worsened by communicational shortcomings, imbalance of roles in relationship and overwhelming stressors and distress.
Lee (2015); Canada	<ul style="list-style-type: none"> Case study post treatment interviews at 1 & 4 month follow-up 	<ul style="list-style-type: none"> $N = 1$ (2); Purposive sampling Clinical context Inclusion: one of spouses DSM-IV-TR score ≥ 5, gambler must have completed a 12-week cognitive restructuring group program, gambler was abstaining from gambling at the time of the study; Exclusion: history of psychosis 	<ul style="list-style-type: none"> CCT Gambler and CSO participate in joint treatment 12 sessions Control: None 	<ul style="list-style-type: none"> Counselor is registered professional Training: NR Supervision: NR Sessions were video and audiotaped Manualized 	<ul style="list-style-type: none"> The 5th interactional circuit (congruence) is presented as a radical transformation and recovery from previous circuits contributing to problem gambling. The couple reported being happy and content, with less stress and strain at home and expanded range and depth of communication.

(continued)

Table 1. Continued

Author (year); Country	Study design; Data collection	CSO sample size (total); Sampling method; Context; Inclusion/exclusion criteria	Treatment arm; Treatment length; Control arm	Clinician qualifications; Training; Supervision; Integrity; Manual	Main findings for treatment process and efficacy
Bastardo Gaelzer (2019; masters thesis) Canada	<ul style="list-style-type: none"> • Case studies • Secondary analysis of treatment session transcripts from Lee and Awosoga (2015) study 	<ul style="list-style-type: none"> • $N = 2$ (4) • Purposive sampling from RCT participants (Lee & Awosoga, 2015) • For original sampling context see Lee and Awosoga (2015) • Inclusion: Couples selected based on favorable treatment outcomes on DAS measurements. • Exclusion: None 	<ul style="list-style-type: none"> • CCT • Gambler and CSO participate in joint treatment • 12 sessions • Control: None 	<ul style="list-style-type: none"> • Counselor is registered professional • Training: NR • Supervision: NR • Sessions were video and audiotaped • Manualized 	<ul style="list-style-type: none"> • The 5 themes identified in thematic analysis describing the process of change were therapeutic alliance, understanding gambling patterns and timeline of addiction, connecting addiction with personal histories, exploring trauma in the context of relationships and healing from trauma and addiction through reconnection with self and others
Shi (2021; masters thesis); Canada	<ul style="list-style-type: none"> • Case studies • post treatment interviews with participants of unpublished RCT study 	<ul style="list-style-type: none"> • $N = 2$ (4) • Purposive sampling from participants from unpublished RCT • Inclusion: participants had completed assigned treatment in RCT • Exclusion: Recent risk of suicide 	<ul style="list-style-type: none"> • CCT • Gambler and CSO participate in joint treatment • 12 sessions • Control: variable treatment as usual, including individual counselling and mutual support groups (participant reports on TAU may also reflect experiences from outside of study treatment) 	<ul style="list-style-type: none"> • Addiction counsellors • 5-day training program prior to treatment • Ongoing consultation with CCT trainer • Integrity: Level of adherence rated by assessment of case notes and teleconference reports • Manualized 	<ul style="list-style-type: none"> • Thematic analysis of TAU experiences highlighted importance of received peer support, psychoeducation related to addiction, learning behavioral skills to support addicted individual, learning coping skills to enhance personal well-being, and improvement of self-worth. • CCT provided a safe space for expression and exploration of traumatic experiences, helped improve communication through practice, and increased awareness and acknowledgment of self and other. This process enabled the couple to be a natural source of support for both individuals.

(continued)



**Table 1. Continued**

Author (year); Country	Study design; Data collection	CSO sample size (total); Sampling method; Context; Inclusion/exclusion criteria	Treatment arm; Treatment length; Control arm	Clinician qualifications; Training; Supervision; Integrity; Manual	Main findings for treatment process and efficacy
Tremblay et al. (2018); Canada	<ul style="list-style-type: none"> • Semi-structured interviews • Follow up 9 months after admission to treatment 	<ul style="list-style-type: none"> • <i>N</i> = 21 (42); • Purposive sampling • Clinical context • Inclusion: age ≥18, couple living together for ≥6 months, 1 partner diagnosed with pathological gambling (WMH-CIDI), and requested help from 1 of 7 treatment centers participating in study; • Exclusion: couple reports alcohol or drug abuse problems (DEBA-Alcohol and Drugs) 	<ul style="list-style-type: none"> • ICT-PG • Gambler and CSO participate in joint treatment • 8-12 sessions, 90 min each; • Control: individual treatment (for both PG and CSO), CSO treatment included support in caring for self and psycho-education about PG 	<ul style="list-style-type: none"> • Qualifications: NR • Training: NR • Supervision: NR • Integrity: NR • Manualized 	<ul style="list-style-type: none"> • The therapeutic process was described as a need for mutual comprehension, which was enabled through effective communication. • ICT-PG participants benefitted from having a neutral person present, practicing communication, and having time allocated for respectful exchanges. • Having partner present in treatment strengthened motivation to remain in treatment for gamblers.
Low threshold online interventions					
Buchner et al. (2019); Germany	<ul style="list-style-type: none"> • Feasibility study on access and retention • Baseline demographics and server usage data 	<ul style="list-style-type: none"> • <i>N</i> = 126 • Self-selected online sampling • Promotion conducted in non-clinical and clinical settings • Inclusion: everyone who provided valid baseline data • Exclusion: None 	<ul style="list-style-type: none"> • Efa, psychoeducative online self-help material • 6 modules, with a minimum 5-day break between modules • Control: None 	<ul style="list-style-type: none"> • NA (Self-directed online modules) • Manualized 	<ul style="list-style-type: none"> • The majority of participants accessed Efa via direct link, highlighting importance of targeted promotion efforts. • Fewer treatment completers were daily internet users than non-completers.
Rodda et al. (2013); Australia	<ul style="list-style-type: none"> • Explorative post intervention survey 	<ul style="list-style-type: none"> • <i>N</i> = 63 • Self-selected online sampling • Non-clinical • Inclusion: CSOs who completed a counselling session and answered a post-intervention survey • Exclusion: None 	<ul style="list-style-type: none"> • Participants received a single session with counsellor via online chat on GHO website including counselling, information and support • Session length 45min • Control: None 	<ul style="list-style-type: none"> • Counsellors had qualifications in psychology or social work • Training in problem gambling and online counselling • Supervision: NR • Integrity: NR • Self-help material is manualized 	<ul style="list-style-type: none"> • CSOs reported choosing online counselling because of ease of access, potential for privacy and anonymity, ease of communication by writing online, and because it provides a pathway into the service system. • CSOs recommended online counselling because they perceived it as being helpful.

(continued)

Table 1. Continued

Author (year); Country	Study design; Data collection	CSO sample size (total); Sampling method; Context; Inclusion/exclusion criteria	Treatment arm; Treatment length; Control arm	Clinician qualifications; Training; Supervision; Integrity; Manual	Main findings for treatment process and efficacy
Rodda et al. (2017); Australia	<ul style="list-style-type: none"> • Explorative post intervention survey 	<ul style="list-style-type: none"> • $N = 62$ • Self-selected online sampling • Non-clinical • Inclusion: participant is a family member or friend of “problem gambler”, and has completed an e-therapy option • Exclusion: None 	<ul style="list-style-type: none"> • Variable e-therapy options on GHO, including counselling via chat or email, peer support and self-directed psychoeducation • Variable length, e.g. 9 self-help modules; 2-3 weekly emails for approx. 6 weeks; 45min chat session with counsellor • Control: None 	<ul style="list-style-type: none"> • Professional counsellors with backgrounds in psychology and social work deliver e-therapy; • Training: NR • Supervision: NR • Integrity: NR • Manual: NR 	<ul style="list-style-type: none"> • The most commonly accessed GHO content were website information, talking to counsellor via chat and reading/contributing to forums. • 54% of participants rated chat services as enough or definitely enough. • Corresponding sufficiency ratings given to website information and forum discussions were 49% and 36%, respectively

NA: not applicable; NR: not reported; CSO: concerned significant other; PG: problem gambling; RCT: randomized control trial; CCT: Congruence Couples Therapy; ICT-PG: Integrative Couple Treatment for Pathological Gambling; CRAFT: Community reinforcement and family training; CBT: cognitive behavioral therapy; BCT: behavioral couples therapy; GHO: Gambling Help Online; TAU: treatment as usual; PGSI: Problem Gambling Severity Index; DSM-IV-TR: Diagnostic Statistical Manual IV Text Revision; DAS: Dyadic Adjustment Scale; WMH-CIDI: World Mental Health Composite International Diagnostic Interview; DEBA: Dépistage/Évaluation du Besoin d'Aide.





Table 2. Risk of bias assessments conducted with Evidence Project risk of bias tool

Study	Cohort	Control or comparison group	Pre/post intervention data	Random assignment to intervention/control	Random selection of participants	Follow-up rate of 80% or more at post-treatment	Comparison groups equivalent on demographics	Comparison groups equivalent at baseline
<i>Answer options</i>	<i>Yes/No</i>	<i>Yes/No</i>	<i>Yes/No</i>	<i>Yes/No/NA/NR</i>	<i>Yes/No/NA/NR</i>	<i>Yes/No/NA/NR</i>	<i>Yes/No/NA/NR</i>	<i>Yes/No/NA/NR</i>
<i>Studies in quantitative synthesis</i>								
Nayoski and Hodgins (2016)	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Magnusson et al. (2019)	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Nilsson et al. (2018)	Yes	Yes	Yes	Yes	No	Yes	NR	No
Nilsson et al. (2020)	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Lee and Awosoga (2015)	Yes	Yes	Yes	Yes	No	Yes	NR	Yes
Kourgiantakis (2017)	Yes	Yes	Yes	Yes	No	No	No	No
Orford et al. (2017)	Yes	No	Yes	NA	No	No	NA	NA
<i>Studies in qualitative synthesis</i>								
Nilsson (2020)	Yes	No	No	NA	No	NA	NA	NA
Lee (2012)	Yes	No	No	NA	No	Yes	NA	NA
Lee (2015)	Yes	No	No	NA	No	NA	NA	NA
Bastardo (2019) ^a	Yes	No	Yes	NA	No	NA	NA	NA
Shi (2021) ^a	Yes	Yes	No	Yes	No	NA	NR	NR
Tremblay et al. (2018)	Yes	Yes	No	Yes	No	NR	NR	NR
Kourgiantakis et al. (2018)	Yes	No	No	NA	No	Yes	NA	NA
<i>Low threshold online interventions</i>								
Buchner et al. (2019)	Yes	No	No	NA	No	No	NA	NA
Rodda et al. (2013)	No	No	No	NA	No	NA	NA	NA
Rodda et al. (2017)	No	No	No	NA	No	NA	NA	NA

NA: not applicable, NR: not reported; ^a Study from Master's thesis; For risk of bias assessment guidelines see online [Supplementary material 3. \(osf.io/hr7s6/\)](https://osf.io/hr7s6/).

Table 3. CSO intervention content checklist

	Intervention content	CRAFT	online CBT ^a	5-step ^b	Std. treat. ^c	BCT ^d	CCT	ICT-PG ^e	Efa	GHO's e-therapy ^f
Information and understanding	Psychoeducation about problem gambling	x	x	x	x	x		x	x	x
	Additional psychoeducation	x	x	x	x		x		x	
	Information on protecting finances	x	x				x	x	x	x
	Information on available services	x	x	x					x	x
	Understanding self			x	x		x	x		
Social support	Understanding gambler	x	x			x	x	x		
	Professional provides advice and information	x	x	x	x	x	x	x		x
	Professional provides therapeutic response	x	x	x	x	x	x	x		
	Building and maintaining social support network	x		x	x				x	
	Peer support				x	x				x
Coping skills	Strengthen mutual support within couple relationship						x	x		
	Reinforce non-gambling behavior	x	x				x	x		
	Avoid reinforcing gambling	x	x				x	x		
	Encourage gambler into treatment	x	x							
	Explore coping strategies			x	x				x	x
	Problem solving skills	x	x					x		
	Dealing with adversities	x							x	
	Self-care	x	x		x		x		x	
Communication	Motivational enhancement	x	x			x		x		
	Plan for potential crisis								x	
	Communication skill training	x	x	x	x	x	x	x	x	
	How to talk about gambling and avoid resistance	x	x				x	x		
Other	Broaden and deepen comm. patterns within couple						x	x		
	Realistic expectations	x	x	x				x	x	
	Goal setting	x	x				x	x		
	Self-monitoring	x	x				x	x		
	Review of content		x						x	
	Future planning		x	x					x	x
	Problem gambling treatment				x	x	x	x		x

Additional sources (beyond included studies) used for intervention content details are indicated with superior letters: ^a Magnusson et al. (2015); ^b Copello et al. (2010); ^c Standard treatment, refers to intervention utilized in Kourgiantakis (2017); ^d Nilsson et al. (2016); ^e Tremblay et al. (2015); ^f www.gamblinghelponline.org.au; For elaboration to the intervention content checklist see online Supplementary material 2. (osf.io/hr7s6/).



CSO. ICT-PG provides a high level of therapeutic contact and utilizes the participants' personal narrative in the treatment. Based on the available description of PG treatment provided, this is presumed to include psychoeducation and motivational enhancement.

Efa: *Buchner et al., 2019*. Efa is an online self-help adaptation to ETAPPE (Entlastungstraining für Angehörige problematischer und pathologischer Glücksspieler – psychoedukativ; Eng. “Palliative Training for Affected Others of ‘Problem and Pathological Gamblers’ – Psychoeducative”) (*Buchner et al., 2019*). Efa provides psychoeducation with text, figures, interactive elements, animations and exercises targeting gambling and the role of being a CSO, stress and coping, social support, financial issues and communication skills. Efa provides guidance in case of domestic violence and places a high emphasis on responsibility, accountability, setting boundaries, and self-care. Efa is strong in providing information and relatively strong in enhancing coping skills and addressing communication.

GHO: *Rodda et al., 2013, 2017*. The first study (*Rodda et al., 2013*) evaluated the reasons for participating in single session chat consultations (or emailing with a counsellor) and the latter study (*Rodda et al., 2017*) explored the GHO e-therapy options more broadly. The website information is directed towards gamblers, but can be utilized by CSOs. The modules include information on gambling issues, building motivation for change and setting goals, and strategies for regaining control.

Quantitative synthesis

This part of the review synthesizes the results from RCT studies (*Lee & Awosoga, 2015; Magnusson et al., 2019; Nayoski & Hodgins, 2016; Nilsson et al., 2018, 2020*) and studies with quantitative data (*Kourgiantakis, 2017; Orford et al., 2017*). An assessment of the outcome instruments' reliability and validity is beyond the scope of the present review.

The most common outcome domains that were measured across studies were symptoms of depression and anxiety, (also framed as psychological symptoms and distress), where the common data collection time-point was post-treatment. Effect size estimates were calculated accordingly for all studies included in the quantitative synthesis (see [Table 4](#) for the effect size estimates). Generally, the studies were unable to confirm greater benefits of the treatment over control conditions, as the confidence intervals spread across the value zero. Nonetheless, a visual inspection of improvement over time seemed to favor treatment conditions. Subsequently outcome-specific findings are presented. Referenced trends in data are not displayed.

Kessler psychological stress scale (K10). In a quantitative study by *Kourgiantakis (2017)* with a treatment and control group, K10 (time frame past week) was used. Only combined results of dyads (gambler and CSO) were reported.

The effect size was small (-0.17). Although significant group differences were not detected, a decreasing trend was evident.

Patient health questionnaire (PHQ-9) & generalized anxiety disorder questionnaire (GAD-7). Three studies (*Magnusson et al., 2019; Nilsson et al., 2018, 2020*) used PHQ-9 and GAD-7. In the RCT pilot study by *Nilsson et al. (2018)* treatment groups were not equivalent in the baseline measures and the control group scored systematically higher on both scales, which translated into medium and large effect sizes (-0.36 and -0.52) favoring the treatment group.

Similarly, small effect sizes favoring treatment in the *Nilsson et al. (2020)* study on depression (-0.13) and anxiety (-0.04) symptoms were detected. In *Magnusson et al. (2019)* data, a decrease in depression symptoms equivalent to a medium effect (-0.29) were detected, as well as a decrease in anxiety symptoms equivalent to a small effect (-0.17) favoring treatment.

Brief symptom inventory (BSI). BSI was used in two studies, both with variable control groups (*Lee & Awosoga, 2015; Peden, 2011*). CSO specific BSI raw scores for the *Lee and Awosoga (2015)* study were retrieved from the author. In *Lee and Awosoga's (2015)* study the effect size estimate was large (-1.11), which is influenced by the fact that the treatment group scored systematically lower than the control group. In *Peden's (2011)* study, the treatment group scored systematically higher than the control group, which led to a small positive effect size (0.16) in the present synthesis. Here, both groups displayed downward trends in scores over time.

Inventory of consequences for the gambler and the CSO (ICS). The ICS subscales concerning CSOs (emotional and behavioral consequences) were selected as an additional outcome measure, because it was used in 3 studies (*Magnusson et al., 2019; Nilsson et al., 2020; Peden, 2011*). The subscale-specific scores from *Nilsson et al. (2020)* study were provided by the corresponding author. The effect size estimates for ICS subscales were of small to medium magnitude ($0.1-0.3$). The ICS subscale scores displayed a decreasing trend over time, and this trend was more pronounced in the treatment group, as also indicated by the effect size estimate. This same declining within group trend, which was more pronounced in the treatment group, was also evident in *Peden's (2011)* study and *Magnusson et al. (2019)* study; although in the latter study, the control group displayed slightly lower baseline scores on the behavioral subscale, which translated into a misleading positive effect size in the present synthesis.

Short questionnaire for family members affected by addiction (SQFM-AA). In the study with a repeated measures design (*Orford et al., 2017*) the SQFM-AA subscale total symptoms was used. This subscale was deemed appropriate for the synthesis, because it is proposed to measure the strain experienced as part of the SSCS model (*Orford, Templeton, Velleman, & Copello, 2005; Orford, Templeton, Velleman, &*



Table 4. Effect size estimates for outcomes of psychological distress and gambling related harm

Study	Intervention/control	Outcome instr.	<i>n</i> (CSO)	<i>M</i> diff	SD* <i>pooled</i>	Hedge's <i>g</i>	CI95
Kourgiantakis (2016)	“TAU”/waitlist	K10	11	−1.42	7.73	−0.17	[−1.54; 1.20]
Magnusson et al. (2019)	online CBT/waitlist	PHQ-9	68	−1.83	6.34	−0.29	[−0.77; 0.20]
Magnusson et al. (2019)	online CBT/waitlist	GAD-7	68	−0.97	5.69	−0.17	[−0.65; 0.32]
Nilsson et al. (2018)	BCT/waitlist	PHQ-9	16	−3.63	9.63	−0.36	[−1.45; 0.73]
Nilsson et al. (2018)	BCT/waitlist	GAD-7	16	−4.30	7.80	−0.52	[−1.62; 0.58]
Nilsson et al. (2020)	BCT/waitlist	PHQ-9	114	−0.70	5.26	−0.13	[−0.50; 0.24]
Nilsson et al. (2020)	BCT/waitlist	GAD-7	114	−0.20	4.67	−0.04	[−0.41; 0.33]
Lee and Awosoga (2015)	CCT/waitlist and variable TAU	BSI	15	−17.83	15.10	−1.11	[−2.32; 0.10]
Peden (2011)	individual CRAFT/workbook	BSI	24	4.47	27.08	0.16	[−0.69; 1.01]
Peden (2011)	individual CRAFT/workbook	ICS emot.	24	−0.64	6.04	−0.10	[−0.95; 0.74]
Peden (2011)	individual CRAFT/workbook	ICS behav.	24	−0.63	4.38	−0.14	[−0.99; 0.71]
Magnusson et al. (2019)	online CBT/waitlist	ICS emot.	68	−2.36	7.27	−0.32	[−0.81; 0.17]
Magnusson et al. (2019)	online CBT/waitlist	ICS behav.	68	0.78	6.04	0.13	[−0.36; 0.61]
Nilsson et al. (2020)	BCT/waitlist	ICS emot.	114	−0.68	7.81	−0.09	[−0.46; 0.29]
Nilsson et al. (2020)	BCT/waitlist	ICS behav.	114	−1.05	4.12	−0.25	[−0.63; 0.12]
Orford et al. (2017)	5-step workbook and variable TAU	Total symptoms	89	−1.76	2.82	−0.62	[−1.21; −0.03]

Hedges' *g* is calculated for post-treatment measurements comparing treatment and control arms for all studies except Orford et al. (2017) where effect size is calculated with the unbiased estimate of the mean difference. See online [Supplementary material 2. \(osf.io/hr7s6/\)](https://osf.io/hr7s6/) for details to effect size calculations; *M* diff = Mean difference (intervention - control).



Copello, 2010). Of note, follow-up measurements were conducted between 3 and 6 months' post treatment. The total symptoms decreased so that the effect size estimate was medium (−0.62). As the participants received variable treatment in addition to the 5-step workbook, the explanation for change remains unclear.

Statistical power. Leaning to the presumption that the true effect size is medium (0.5) in size (using one tailed tests with equal group sizes), achieving a power of 0.95 in magnitude would require a total sample size of 176 (G*Power, version 3.1.9.7). The present sample sizes of the included studies generally fall well below this number.

Qualitative synthesis of treatment processes

Categorizing treatment process descriptions according to the conceptualization presented in the SSCS model (Orford et al., 2013) led to the identification of all these themes (information and understanding; support; coping skills; strain). This highlights the centrality of the SSCS model's concepts for understanding treatment processes. Communication was also a central theme evident in all reports. The central themes described, however, did not capture all the descriptions of treatment processes evident in the reports. Consequently, 8 additional themes were defined (see Table 5). The first three additional themes are specific to

dyadic treatment formats. The remaining themes are considered to influence the treatment process of all interventions regardless of target group. Each theme influences the treatment process at two extremes, with beneficial effects on one end and disadvantageous effects on the other. Figure 2 provides a visualization of the overall synthesis process.

Narrative description of low threshold online intervention studies

This part of the review narratively describes the findings from the three low threshold online interventions (Buchner et al., 2019; Rodda et al., 2013, 2017).

In the Efa feasibility study (Buchner et al., 2019), the majority (82.5%) of participants accessed the site via a direct link. 67.5% of the participants had not sought any professional support or self-help previously, suggesting that promotion efforts were effective in reaching new clientele. 32% of the participants did not finish a single module, 31% finished some but not all modules, and 37% completed all modules. The findings suggest that sending out motivational reminder emails after prolonged non-engagement with the program may reduce the drop-out rates.

GHO counselling (chat and email support) were evaluated in Rodda et al. (2013) report. In terms of the qualitative

Table 5. Descriptions to themes generated in qualitative synthesis of treatment processes

Core themes

Information and understanding: Refers to gaining a better understanding of the gamblers behavior, and heightened mutual comprehension and self-awareness. Approached through psychoeducation and open communication.

Social Support: Includes mutual support within dyad, professional support received in treatment, and social support facilitated through treatment (i.e. peer support groups or online forum discussions).

Coping skills: Provision of strategies for communication, emotion regulation, problem-solving, reinforcing non-gambling, avoiding reinforcement of gambling, self-care, changing maladaptive cognitions and learning to utilize available social support.

Communication: Development of communication patterns to become more reciprocal, open and honest. Proposed to be a key factor in achieving sustained change in relation to gambling and interpersonal problems.

Strain: Negative emotions and thoughts that were attributed to gambling or interpersonal problems. Addressing strain was often a target of interventions.

Additional themes

Gambling behavior: Prominent when the gambler is involved in treatment, where abstinence may be a motivator to treatment entry and part of treatment goals. Abstinence and relapse may influence treatment drop-out. ^{a, b, c, d}

Interpersonal nature of the problem: Prominent in couple's treatment, where treatment goals relate to improving communication and mutual comprehension and utilizing relationship as a natural source of support. ^{a, c, d, e, f, g}

Motivation to change: Relates to how CSO involvement influences gambler motivation. Gambler motivation towards change was also described to influence treatment adherence independently of the CSO. ^{a, b, c, e}

Comorbidity: Refers to participants dealing with multiple conditions that complicate the treatment process. ^{c, e}

Personal history: Refers to addressing past hardships as part of the treatment process. This also includes the exploration of intergenerational trauma and past communication patterns. ^{a, c, d, f, g}

Cognitive functioning: Refers to the processing styles participants have which may influence what avenues are fruitful in treatment (e.g. ability to address past relationships). ^a

Barriers: Refers to life circumstances (e.g. divorce) and resource related factors (e.g. time requirements for face-to-face participation) that influence treatment engagement. ^{b, c}

Content and format: Subtheme to support, which highlights the potential benefits and pitfalls to different ways of delivering treatment. Partially dependent on personal preferences. ^{a, b, c, d}

All included reports contributed to the core themes. Reports that contributed to additional themes are indicated with superior letters: ^aBastardo Gaelzer, 2019; ^bNilsson, 2020; ^cShi, 2021; ^dTremblay et al., 2018; ^eKourgiantakis et al., 2018; ^fLee, 2012; ^gLee, 2015; For elaborated descriptions to themes see Supplementary material 2. (osf.io/hr7s6/).



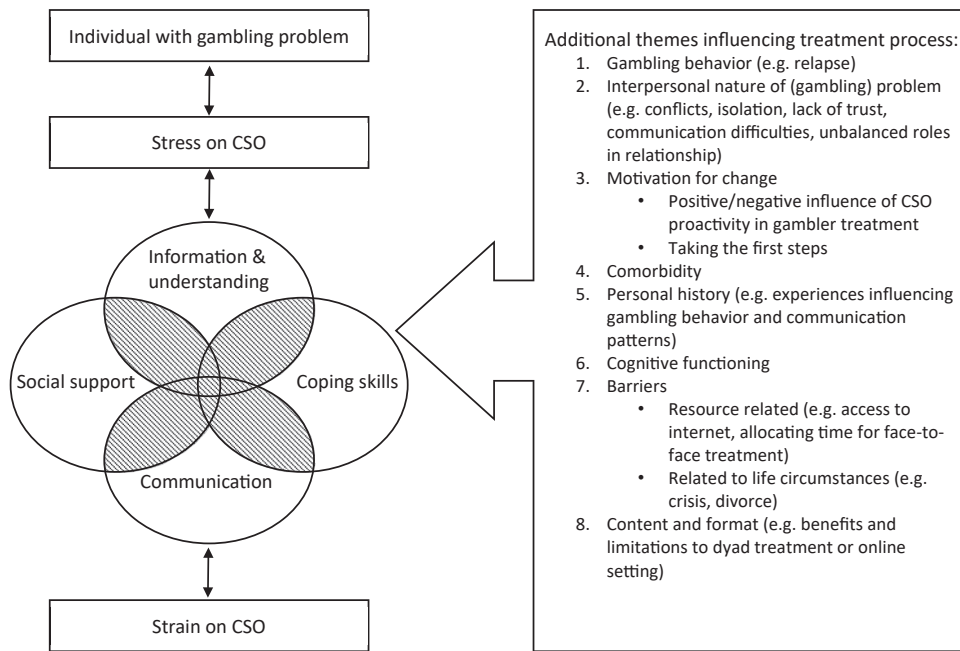


Fig. 2. Conceptual visualization of qualitative synthesis findings utilizing the stress-strain-coping-support model (Orford et al., 2013) as the theoretical framework

synthesis methodology, all central themes were identified (information and understanding, social support, coping skills, communication and strain). Out of the additional themes, content, format, and barriers were identified. The therapeutic alliance (active and emphatic listening and being non-judgmental) contributed towards perceiving the counselling as helpful, as did the provision of information and guidance. The findings highlighted how the online format contributed toward help-seeking because of its easy and immediate access, anonymity, ease of written communication, and access to further services.

An explorative study of GHO e-therapy options (Rodda et al., 2017) revealed that 93% of CSOs had sought help from various sources: e.g., gambling hotlines (68%) and face-to-face counselling (42%). 54% of the participants rated the sufficiency of talking to a counsellor via chat as enough or definitely enough. Of those who received information or referral from a counsellor, 73–83% reported they would follow up on what they received.

The reasons for seeking help included: seeking information, approaching the gambler, encouraging help and supporting change. The findings indicate that interventions should strive to provide psychoeducation, improve coping skills and social support, and reduce the impacts of PG.

DISCUSSION

This systematic review provided an overview of available studies concerning interventions directed towards CSOs of individuals experiencing gambling problems and provided a description of the interventions' content. Moreover, the systematic review evaluated the benefits of these

interventions with a quantitative synthesis and provided a thematic description of treatment processes with a qualitative synthesis. In total, the evidence of 17 studies documented in 19 reports was summarized. The present study adds to the literature along with recent reviews (Archer et al., 2020; Kourgiantakis et al., 2021; Merkouris et al., 2020), by including qualitative studies and unpublished literature. In the time since Kourgiantakis et al. (2013) review, numerous novel interventions have emerged (online CBT, BCT, ICT-PG) including also low threshold online interventions (Efa, GHO). Furthermore, research on CCT has continued, and the use of the 5-step method has been broadened to the gambling context. However, new studies on CRAFT (with reports written in English) or CST have not been conducted.

Intervention content and purpose

The intervention content checklist created as part of the synthesis process is essentially a summary of topics included in the interventions reviewed and it facilitates a comparison of the treatment options.

A common starting point is providing psychoeducational information on gambling and PG, with variable practices for providing further psychoeducation. Our results revealed divergent approaches to delivering training on coping and communication skills. For instance, CRAFT provides advice on adaptive and maladaptive coping strategies which are predefined; the 5-step method on the other hand approaches coping skills from the presumption that the utility of strategies depends on contextual and situational factors. CCT addresses the enhancement of coping skills by broadening communication, which ultimately provides support from within the couple's relationship. The interventions varied in

the degree of professional *support* provided, and the facilitation of informal *social support* also varied between interventions, including access to online forums (BCT) and face-to-face group meetings (standard treatment).

No single intervention appears preferable to others in terms of content—although a clearly defined structure and content makes certain interventions more appealing in terms of systematic implementation and for studying the mechanisms of change. Specifically, CRAFT, online CBT, BCT and ICT-PG appear to be more appealing than the 5-step approach, standard treatment, or CCT in this regard. Furthermore, as the identified interventions have divergent target populations and aims, it is of utmost importance to direct treatments accordingly by developing a tool to identify treatment needs and provide tailored support, as noted recently (Merkouris et al., 2020).

Quantitative findings

Generally, the studies were unable to confirm greater benefits of the treatment compared to the control conditions. Recent meta-analyses based on studies concerning CSOs affected predominantly by problematic alcohol and substance use concluded the evidence for change over time to be most consistent for CRAFT, although there was no clear evidence of greater benefits compared to other active interventions (Merkouris et al., 2020), which is in line with our results. Merkouris et al. (2020) further concluded that the 5-step method was mostly evaluated with one-arm study designs and displayed mixed findings, which is also in line with present findings. While the trends in the observed data seemed to indicate gradual improvement, it is important to keep in mind that this may also be the result of regression to the mean (Barnett, van der Pols, & Dobson, 2005). In terms of statistical power and based on sample sizes, it is reasonable to question whether the reviewed studies were adequately equipped to detect the true effects. Our study highlights the importance of achieving sufficient statistical power, extending follow-up periods, and planning RCTs rigorously. Furthermore, using other methodological approaches which may shed light on treatment processes, such as n-of-1 study designs (Berli, Inauen, Stadler, Scholz, & Shrout, 2021; Lakens, 2013; McDonald et al., 2017) should be considered.

Detecting the treatment effects also relies heavily on measurement procedures. The present review showed that the use of variable outcome measures hampers evaluation, as similarly detected by Merkouris et al. (2020). Validated instruments with clinical utility should be preferred. Measuring the harm experienced in a unified manner may provide an appropriate way forward. The harm caused by gambling can be assessed with subjective outcomes, such as quality of life, as opposed to the measurement of symptoms (Bonfils et al., 2019).

The harm experienced by CSOs varies markedly depending on the relationship to the gambler, and as such tailored interventions that meet specific needs are necessary, which may lead to better adherence and outcomes (Magnusson, 2019). Poor efficacy ratings for CSO interventions may indicate that current interventions are not meeting the

needs of CSOs, and this calls for further research to identify help-seeking preferences, effective intervention content, and usage of appropriate instruments to evaluate the outcomes (Dowling, 2020).

Framework of treatment processes

Findings from the qualitative synthesis are presented in Table 5 and Fig. 2. This presentation is grounded in the SSCS model, which served as the starting point for interpreting findings. The SSCS conceptualization has been elaborated upon by suggesting a reciprocal association between the CSOs and gambler (opposed to a one-directional model where the CSO is influenced by the gambler) as also previously proposed (Kourgiantakis et al., 2018). Figure 2 also highlights the evident overlap between the themes (or components) that influence the *strain experienced* (i.e., mechanisms of change). The addition of *communication* as a fourth central theme conforms with the Cocreating Life Pathways model, which identifies communication as a key enabler of change (Kalischuk, 2010). The core themes identified also align with the fact that psychoeducation, coping skills training and peer/professional support are considered cornerstones of family interventions (Lucksted, Mcfarlane, Downing, & Dixon, 2012). The additional 8 themes identified further elaborate upon aspects which influence treatment processes.

The findings displayed in Table 5 and Fig. 2 can be utilized in the implementation and development of CSO support services and may inspire CSO intervention research with the displayed acknowledgment of reciprocal associations. Comprehensive techniques and exercises that overlap several themes are represented within the shaded area of Fig. 2. For example, the functional analysis from CRAFT is “situated” in the overlapping area of *information and understanding* and *coping skills*. Similarly, engaging in rewarding activities with the gambler entails an overlap of *coping skills* and *social support*, and facilitating communication within a couple enhances *communication skills* and mutual *understanding*. Taken one step further, techniques grounded in the shaded area can be presumed to influence the strain experienced by CSOs more effectively than techniques outside of the shaded area. For example, reading about *coping skills* does not necessarily lead to their application. The right question to ask then, is how do we determine who benefits sufficiently from self-directed interventions and who needs more intensive support? In terms of implementation, this again turns to the need for tailored interventions combined with screening of the participants, as noted previously (Merkouris et al., 2020).

Mode of delivery

Self-directed interventions, either in the form of workbooks or online modules, have been put forward as a low-cost minimal form of treatment with good ease of access. The present findings indicate that low threshold online interventions (e.g., Efa and GHO) may successfully reach new clientele and satisfy their needs. Moreover, as seen within



the reviewed studies, this approach has also been coupled with counsellor interaction as a means to enhance the motivation and adherence to treatment, as well as to enhance comprehension of the material (e.g., online CBT). Further, online treatment formats enable the easy utilization of peer support with moderated online forums (e.g., BCT and GHO), although it remains unclear how helpful participants perceive reading and contributing to forum discussions to be. In sum, it is important to tailor the modality of interventions to meet the needs of subgroups, support adherence where needed, minimize the drop-out rate, identify the mechanisms of change in interventions, and evaluate the duration of beneficial effects of interventions, as also noted previously (Cunningham, Gulliver, Farrer, Bennett, & Carron-Arthur, 2014).

Study strengths and limitations

The strengths of this systematic review were the exhaustive search strategy and lenient inclusion criteria which resulted in a wide array of included reports. Additionally, thorough screening and assessment procedures minimized the risk of bias. However, the inclusion of unpublished research may have introduced bias, as such work has presumably not been appraised to the extent of published research. Utilizing a theoretical framework in the interpretation of the results enabled creating a coherent synthesis of a variety of studies, including a qualitative synthesis, which is a novel contribution to the literature. The chosen risk of bias tool enabled an assessment of all type of studies correspondingly, however, it may not have been as rigorous as tools tailored per methodology. A novel intervention content checklist was created, but limitations should be noted. The checklist does not provide information on the techniques used to approach these themes or the time and effort used to explore them. Furthermore, the checklist relies entirely on descriptions provided elsewhere, and therefore cannot be presumed to comprehensively capture all treatment content, and not all items are mutually exclusive. Of note, limiting searches to reports written in English excluded at least 3 relevant studies. The strength of evidence in the quantitative synthesis is low due to methodological issues, and the clinical significance of the findings were not discussed. Future studies pursuing the identification of relevant grey literature should also consider utilizing additional resources such as the Greo Specialized Resources (Greo, 2021).

CONCLUSIONS

A range of interventions with different aims, target groups and modes of delivery were identified in the systematic review. The included studies utilized variable methodologies so that no specific intervention appeared to have better outcomes than the others. The commonalities and differences in intervention content were identified, along with the themes that influenced treatment processes. For the variable needs of CSOs to be met, interventions need to be tailored

accordingly. Assignment to treatment types is suggested to be based on screening procedures. Future research needs to carefully plan study designs and outcome measures in order to accurately assess mechanisms of change and treatment efficacy.

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Authors' contribution: Conceptualization and planning: RE, PP, SR, SC; Methodology: RE, PP, SC; Formal Analysis: RE, SR, SC; Statistical analysis: RE; Writing original draft: RE; Writing RE, SC; Interpretation of results: RE, SC, SR; Review and editing: RE, PP, SR, SC; Visualization: RE; Study supervision: SC; Supplementary materials 1.: RE, PP; 2: RE; 3: RE.

All authors had full access to all data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Conflicts of interest: All authors (RE, PP, SR, SC) declare that they have no conflicts of interest.

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SUPPLEMENTARY MATERIAL

Supplementary data to this article can be found online at <https://doi.org/10.1556/2006.2021.00088> and also at osf.io/hr7s6/.

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