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Effect of synchronous remote-based interventions on suicidal behaviours: protocol for a systematic review and meta-analysis

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ABSTRACT

Introduction Suicide is among the leading causes of preventable death worldwide. The impact of suicide affects the personal, social and economic levels. Therefore, its prevention is a priority for public health systems. Previous studies seem to support the efficacy of providing active contact to people who have made a suicide attempt. The current systematic review and meta-analysis aims to investigate the efficacy of distance suicide prevention strategies implemented through synchronous technology-based interventions.

Methods and analysis This protocol is designed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols. The bibliographical searches were conducted in the databases PubMed, PsycINFO, Scopus and Web of Science in April 2022, with no restrictions on the time of publication and limited to publications in English or Spanish. The search strategy was performed using free-text terms and Medical Subject Headings terms: suicide, follow-up, synchronous, remote, telehealth, telephone, hotline, video-conference and text message. Two reviewers will independently conduct study screening, selection process, data extraction and risk of bias assessment. The analysis and synthesis of the results will be both qualitative and quantitative. A narrative synthesis, presented in a comprehensive table, will be performed and meta-analysis will be conducted, as appropriate, if sufficient data are provided.

Ethics and dissemination The present review and meta-analysis will not require ethical approval, as it will use data collected from previously published primary studies. The findings of this review will be published in peer-reviewed journals and widely disseminated.

PROSPERO registration number CRD42021275044.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Study screening, quality assessment and data extraction will be determined by transparency, precision and significance according to the Preferred Reporting Items for Systematic Review and Meta-Analysis.
⇒ The systematic review will focus on peer-reviewed articles, and findings will be limited to articles written in English or Spanish.
⇒ Randomised clinical trials, quasi-experimental trials and observational case–controlled studies will be included to obtain sufficient data and adequate statistical power for meta-analysis.
⇒ There is a potential limitation attributed to the expected small sample size of the included studies and the heterogeneity of the study designs.

INTRODUCTION

Suicide is a universal, complex and multifaceted public health problem that ranks annually among the leading causes of preventable death worldwide. More than 700 000 people die by suicide per year,[1] becoming the 17th leading cause of death in 2019 in global epidemiology.[2] Annual suicide rates account for 1.4% of all deaths worldwide.[3] Suicide rates in European regions (10.5 per 100 000) were higher than the global average (9.0 per 100 000) in 2019, while the lowest suicide rate was in the Eastern Mediterranean region (6.4 per 100 000).[2 3] For each suicide death, there are 20 suicide attempts,[4] constituting one of the leading causes of disease burden in the world.[5 6] While most of the world's suicides occur in low-income and middle-income countries, high-income countries have the highest age-standardised suicide rate (10.9 per 100 000).[2 3] Moreover, suicide represents the fourth leading cause of death among people aged 15–29 years in global epidemiology.[1 3] The number of adolescent deaths due to suicide has increased dramatically, with data reflecting that suicide represents a rate per year of 0.19/100 000 in people under 15 years of age and a rate per year of 2.23/100 000 in the 15–19 age group, according to the Spanish National Institute of Statistics.[7]

Suicide prevention is an emerging priority for the public health system due to its high

social burden.[8] Evidence suggests that a prior suicide attempt is one of the most important risk factors for suicide, which supports the efforts to protect patients who attempt suicide during the acute period following an episode of self-harm.[9 10] It is estimated that 20% of people who had engaged in suicidal behaviour showed a subsequent episode, and that 88% of these reattempts occurred within 2 years of the initial episode.[11] Furthermore, a lack of follow-up care provided by healthcare professionals has been identified as a risk factor for repeat suicide attempts in patients discharged from the emergency department (ED).[12]

Over the last decades, the relevance of developing evidence-based prevention strategies focused on reducing the likelihood of suicide attempts in high-risk patients has become evident.[13–16] Suicide prevention programmes include a wide range of follow-up actions that promote connectivity between the patient and the mental health provider (sending letters, conducting telephone calls, texting via SMS (Short Message Service), providing follow-up visits in specialised healthcare centres or implementing 24/7 hotlines).[17 18] The development of information and communication technologies has created opportunities and challenges in prevention, research and clinical practice. eHealth interventions represent tools that allow reaching a larger number of at-risk populations, facilitating proactive follow-up compared with face-to-face treatments.[19]

Considering that remotely delivered distance-based programmes can reach affected people regardless of their location, it is reasonable to expect that these interventions could be part of future suicide prevention efforts.[17 18] Remotely, brief contact-based interventions can be a cost-effective strategy for suicide prevention in healthcare settings.[20–22] In a recent meta-analysis, Inagaki *et al*[12] found that secondary prevention programmes involving active contact and follow-up can be effective in reducing the risk of a repeat suicide attempt within 6 months of admission to an ED for suicidal behaviour. Moreover, promising results seem to be reported in studies that conduct telephone follow-up interventions for individuals at risk as a suicide prevention strategy.[23–30] Telephone management in a clinical practice setting could be a useful and not expensive programme to implement in mental health centres.[23 31]

In 2015, Milner *et al*[32] conducted a systematic review and meta-analysis of 14 randomised controlled trials (RCTs) using brief contact interventions and found that considerable differences in outcomes are likely to exist depending on the intervention condition and time period over which the study was conducted (ie, studies that reported on the effectiveness of the intervention condition in reducing suicide attempts were conducted some decades ago and were rated as having a high risk of bias (RoB), whereas recent studies find more conservative results). Given the possible benefits, low cost and unlikely adverse effects, large-scale trials in clinical populations would be worthwhile; however, the authors do not recommend widespread clinical implementation of brief contact interventions. In 2016, Noh *et al*[33] examined five RCTs comparing telephone-delivered interventions for preventing suicide reattempts with no telephone intervention. The results suggest that, in the case of providing telephone-delivered intervention only, more aggressive, structured and theory-based telephone interventions led by mental health professionals should be designed and examined in the form of large-scale RCTs. It should be noted that there is an overlap in the studies included in the Milner *et al*[32] and Noh *et al*[33] meta-analyses.

Although there is no clear consensus on the effect of these programmes in previous systematic reviews and meta-analyses,[32 33] there are data that appear to support the efficacy of providing active contact to individuals who have made a suicide attempt.[12 17 34] Overall, there are studies with positive results in the reduction of suicide-related outcomes[23 26 29 30] and others that have found conflicting or inconclusive evidence,[25 35 36] suggesting the suitability of conducting a systematic review with meta-analysis of the current scientific literature. Despite evidence describing a broad range of telecommunications-based suicide prevention approaches,[21 37] we are not aware of any publications that provide a synthesis of the literature on interventions that develop the use of synchronous strategies in suicide prevention. Based on the concept of connectivity,[34] combined with a component of immediacy in the communication system, synchronous communication can increase accessibility, adherence and treatment efficacy.

This study aims to collect and synthesise information on the efficacy and effectiveness of remote suicide prevention strategies implemented through technology-based synchronous interventions (ie, via digital tools that allow interactive and immediate real-time communication conducted remotely).

METHODS AND ANALYSIS

The primary source used to describe the methods of this protocol was the Cochrane Handbook for Systematic Reviews of Interventions (V.6.2),[38] specifically Part 2: Core methods 'Chapter 2: Determining the scope of the review and the questions it will address' to 'Chapter 10: Analysing data and undertaking meta-analyses'. The protocol was constructed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols[39 40] (see online supplemental file 1). A version of the protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO), under identification number CRD42021275044.

Systematic review question

The research question was built according to PICOS criteria (Population, Intervention, Comparison, Outcomes and deSign).[41] In adolescents and adults (≥12 years of age) with suicidal ideation or prior suicide attempts (P), what is the efficacy and effectiveness of synchronous remote-based interventions (I) in the prevention of non-fatal

suicide attempts and suicide deaths (O) compared with active or inactive control groups (C) with any follow-up length?

Criteria for included and excluded studies

Types of studies

The review will consider published empirical research with the following study designs: randomised clinical trials, quasi-experimental trials and observational case–controlled studies. Primary data from cohort study designs or qualitative studies and secondary sources (eg, systematic reviews, meta-analyses) will be excluded.

Types of participants

The population of interest will include adolescents and adults, defined as anyone over the age of 12 years, who have reported suicidal ideation or prior suicide attempts. No restriction will be placed on gender, geographical provenance or diagnosis. Participants with non-suicidal self-injury will be excluded.

Types of interventions

Synchronous remote-based interventions will be defined as programmes delivered through a technology device that is characterised by (a) ensuring interactive and immediate communication, and (b) not requiring the patient to be at the same physical location as the mental health provider. Interventions should aim to reduce suicide risk by communicating with patients through telephone follow-up or active contact (ie, contact with healthcare services made spontaneously by participants at elevated risk of suicidal behaviour, such as a phone call or hotline), instant text messaging or video-conference. The synchronous remote communication should include some, but not necessarily all, of the following elements: improving compliance with medication and follow-up appointments, addressing any problems, stressors or risk factors, and reducing reattempts. No restriction will be placed on the intensity or duration of the intervention.

We will include interventions delivered via synchronous remote-communication technologies; however, synchronous remote-based programmes that include minimal face-to-face contact (ie, in-person contact for a maximum of one session) or are complemented with multimedia-delivered materials will be also considered. Studies using asynchronous telecommunication devices such as online forums and communities, social networking sites, video sharing sites, automated one-way text or voice messages, and self-directed web-based programmes will be excluded. Studies that describe treatments focused on the prevention of non-suicidal self-harm will be excluded. In addition, the interventions for issues such as psychosis, eating disorders and depression, which are not intended to specifically address suicidal behaviour, are out of the scope of this review.

All comparisons identified in the eligible studies will be included, such as treatment as usual (TAU), enhanced TAU, no treatment, placebo, waiting list and historical control. Therefore, the review will include active (ie, participants engaged in some tasks unrelated to suicide prevention during the study period) or inactive control groups. The control group may involve a combination of strategies: visits to mental health services, non-psychological therapies (eg, pharmacotherapy) and other expected interventions. Studies that do not include a control group will be excluded (eg, cross-sectional trials).

Types of outcome measures

The main outcomes will be the repetition of suicide attempt, suicide ideation and suicide death. Suicide is defined as a self-inflicted and potentially injurious behaviour that is performed as a deliberate method to die.[42] Suicide attempts are defined as self-inflicted harm with a non-fatal outcome for which there is evidence, explicit or implicit, of the intention to die.[3] Furthermore, suicidal ideation is described by thoughts, ideas or ruminations about the possibility of ending one's life.[43]

The assessment can be conducted post-intervention with no limit on the length of follow-up, employing quantitative measurement of suicidal-related outcomes. The suicidal ideation outcome may be measured using different validated instruments (table 1). According to a recent systematic review,[44] the most common instruments are the Beck Scale for Suicide Ideation and the Columbia Suicide Severity Rating Scale. The non-fatal suicide attempts outcome will be measured by the number of suicide attempts a person has made within a certain time frame. The suicide death outcome will be measured by the number of people who have died by suicide.

Data collection and analysis

Information sources and search strategy

Literature searches were conducted in the following electronic databases: PubMed (by National Center for Biotechnology Information-National Library of Medicine-National Institutes of Health website), PsycINFO (by ProQuest), Scopus (by ww.scopus.com) and Web of Science Core Collection. Grey literature and unpublished records were searched on the following websites: ClinicalTrials.gov and Google Scholar.

Authors of published articles will be contacted to retrieve relevant information about their study that was either not reported or unclear. The references cited in the included articles will be considered for data collection. We will also examine the reference lists of existing systematic reviews on similar topics to identify other relevant articles. In addition, the personnel files of the workgroup members will be checked and experts in the field of suicide will be consulted regarding relevant publications.

The search strategy was performed using relevant subject headings and search syntax appropriate to each database, including variations and combinations of free-text terms and thesaurus of psychological index terms (American Psychological Association) or Medical Subject Headings terms, combining with appropriate Boolean operators. The general structure of search syntax was:

Table 1 Instruments most cited in the literature for assessing suicide risk

Instrument	Reference
Beck Scale for Suicide Ideation	Beck *et al*[62]
Columbia Suicide Severity Rating Scale	Posner *et al*[63]
Beck Suicidal Intent Scale	Beck *et al*[64]
Paykel Suicide Scale	Fonseca-Pedrero and Pérez de Albéniz[65]
Beck Suicide Scale–worst ever version	Beck and Steer[66]
Suicidal Ideation Questionnaire (SIQ; SIQ-Junior)	Reynolds[67]
Mini-International Neuropsychiatric Interview	Sheehan *et al*[68]
Risk of Suicide Questionnaire (RSQ; RSQ-Revised)	Horowitz *et al*[69]
Suicide Score Scale	Innamorati *et al*[70]
Suicide Opinion Questionnaire	Domino *et al*[71]
World Mental Health Composite International Diagnostic Interview	Kessler and Ustün[72]
InterSePT Suicide Scale	Lindenmayer *et al*[73]
Plutchik Suicide Risk Scale	Koslowsky *et al*[74]
Harkavy-Asnis Suicide Scale	Friedman and Asnis[75]
Suicide Probability Scale	Cull and Gill[76]

(suicid* OR self-injur* OR self-harm OR "self-destructive behavio*" OR self-poisoning) AND (intervention OR therap* OR treatment OR psychotherap* OR prevention OR follow-up OR contact OR post-discharge) AND (synchron* OR remote OR non-presential OR non-face-to-face OR distance OR digital OR online OR telehealth OR telemedicine OR eHealth OR mHealth OR telephone OR phone OR call OR hotline OR helpline OR "suicide line" OR chat OR videoconferen* OR App OR text messag* OR SMS) AND ("randomised controlled trial" OR "controlled clinical trials" OR "clinical studies") NOT (review OR protocol). The drafted electronic search strategy for PubMed database is included in the online supplemental file 2.

The search was scheduled to be completed by April 2022. All searches have been rerun, before publication of the article, as more than 12 months have elapsed since the date of the initial search. The search was limited to English or Spanish and was performed with no restrictions on the time of publication.

The search strategy was developed by the research team with the collaboration of an experienced health science librarian (GC), adhering to the Peer Review of Electronic Search Strategies.[45] Sensitivity (ie, retrieval rate) and specificity (ie, precision rate) criteria were considered in the development of the literature search strategy[46 47]; however, sensitivity was prioritised.

Data management

Results from the literature search will be imported into Rayyan Systems,[48] an internet-based software program that facilitates collaboration and pursuit accelerated screening process. During the review process, this tool will be used to identify duplicate records and manage the data. Mendeley (V.1.19.8) will be employed as reference management software.

Selection process

In the first phase, duplicate articles in the databases will be automatically removed by Rayyan Systems and manually by the first reviewer (LC). In the second phase, two authors (LC and MPJV) will blind-screen all articles based on titles, abstracts and keywords. In the third phase, the two reviewers (LC and MPJV) will independently evaluate the full-text articles according to eligibility criteria. The reasons for excluding articles will be recorded. If necessary, a third reviewer (AS) will be requested for discrepancies that may not be resolved by a consensus among the two reviewers (LC and MPJV). Inter-rater agreement will be calculated by Cohen's kappa in the second and third phases, prior to reaching a consensus on the discrepancies between the two reviewers or contrasting them with a third reviewer. The article selection process will be described in a Preferred Reporting Items for Systematic Review and Meta-Analysis flow diagram.[49]

Data collection process

Data extraction will be conducted independently by two authors (LC and MPJV), using a standard extraction form in line with the template from the Cochrane Collaboration.[50] Data will be managed using Microsoft Excel (V.16.56). For missing information or data that need to be clarified, first or corresponding authors of primary studies will be contacted by email; one follow-up email will be sent if no response is received to the first email.

Data items

Data will be extracted from the following categories: (a) general characteristics of the study (authors, date of publication, setting and geographical location, research design, sample size, participant sociodemographic and baseline characteristics), (b) intervention and control group details (type of intervention or control group,

sample sizes, follow-up time, dropout rates), (c) outcomes (descriptive and comparative statistical indexes of efficacy and effectiveness, assessment measures and procedures) and (d) limitations reported by study authors.

RoB assessment

The RoB assessment will be conducted independently by two reviewers (LC and MPJV), employing the revised Cochrane RoB tool for randomised trials (RoB 2.0)[51] and Risk-of-bias In Non-randomised Studies–of Interventions.[52]

Inter-rater agreement will be calculated by Cohen's kappa. Disagreements will be resolved by a consensus with a third blind reviewer (AS). Ratings of bias for each study will be classified as low, high or unclear RoB, according to standardised methodology. Intramethodological quality evaluation will be synthesised in tables that will comprise the summary of each study individually, identifying their RoB. Studies will not be excluded based on their level of RoB.

Data synthesis

A descriptive summary and explanation of the characteristics and findings of all included studies will be displayed in a comprehensive table. A narrative synthesis will be conducted, and a random-effects meta-analysis will be computed when a suicidal-related outcome is reported in at least three studies. To ensure that the data we are combining from different studies are comparable and can be appropriately synthesised, several adjustments may be necessary. These adjustments could involve contacting study authors to request more detailed data or transforming the data (eg, if we encounter a situation where some studies report suicide attempts as a binary outcome while others report them as a count); conducting sensitivity analyses to assess the impact of the articles; performing subgroup analyses for each type of data; or adopting a narrative synthesis approach when a quantitative combination of studies is not feasible. Any data transformations will be documented in the manuscript, and the limitations introduced by differences in data reporting between studies should be acknowledged.

Three types of meta-analyses will be conducted according to the type of outcome measure: count (incidence rate ratio between groups of the number of suicide attempts), quantitative (standardised mean differences of suicidal ideation) and binary (OR between groups in the proportion of deaths by suicide). All outcomes will be analysed at different follow-up time intervals, as indicated below in the description of subgroup analyses. Comparisons adjusted for confounders between groups will be included in meta-analyses when reported in studies, and the effect of these adjustments on the meta-analytical summary will be studied using sensitivity and subgroup analyses. Mean differences between the control group and intervention group will be transformed into Hedges' g standardised effect sizes,[53] which means different tools for measuring suicidal ideation will be combined. Effect sizes will be considered small (g≥0.2), medium (g≥0.5) or large (g≥0.8).[54] The Q and tau^2 statistics will be calculated to assess the statistical heterogeneity of effect sizes. Specific functions will be used to examine: (a) the profile likelihood plots of the variance components; (b) the potential outlying and influential studies and/or outcomes; and (c) the potential publication bias. All analyses will be performed using the Metafor package (V.4.0-0) for R.

Sensitivity analysis

The potential effect on the results due to the trial design (ie, pragmatic vs explanatory trials), the adjustment for confounding and the RoB of the studies will be analysed, if feasible.

Analysis of subgroups or subsets

Subgroup and subset analyses will be carried out if feasible and warranted to examine potential effect modifiers based on sociodemographic characteristics of participants, length, type of treatment, research design, adjustment for confounding and RoB assessment. Meta-regression will be performed to analyse quantitative potential effect modifiers or covariates that might influence the size of the intervention effect (eg, age). We plan to summarise and categorise the below subgroup or subset analyses if there are enough data:

a. Age: adolescents (12–17 years of age), adults (18–65 years of age) and older adults (over 65 years of age).
b. Type of intervention: type of synchronous remote-based interventions (telephone calls, instant text messaging, 24/7 hotlines, video-conferencing).
c. Number of follow-up contacts: hotline (24-hour consultation with a non-standardised number of follow-up contacts), one to three contacts, three to six contacts and more than six contacts.
d. Length of contact period: hotlines (24-hour consultation with a non-standardised period of follow-up contacts), up to 1-month follow-up, follow-up 1–3 months, follow-up 3–6 months and longer than 6-month follow-up.
e. Research design: RCTs, quasi-experimental trials and observational case–controlled studies.
f. Adjustment for confounding: adjusted for confounding variables or no adjustment.
g. RoB assessment: low, high and unclear RoB.

Publication bias

Publication bias will be evaluated using Egger's test,[55] funnel plots,[56] and trim-and-fill approaches.[57]

Confidence in cumulative evidence

The overall quality of evidence will be evaluated according to the Grading of Recommendations Assessment, Development, and Evaluation[58 59] by two independent researchers (LC and MPJV). Discrepancies will be resolved in a discussion with a third researcher (AS).

Patient and public involvement

Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of this research.

DISCUSSION

The wide variety of remotely delivered distance-based programmes for suicide prevention[20 23 26–28] and the current lack of guidance on their implementation warrant further research to improve and standardise patient care.

To the best of the researchers' knowledge, no systematic review and meta-analysis has been reported that examined the efficacy of synchronous and remote telepsychiatry interventions, assessing suicide-specific outcomes. We aim to address a gap in research by examining the efficacy of synchronous remote-based interventions that are specifically designed for suicide prevention. The proposed approach is pertinent given the recent increase in the development and usage of technology communication devices for this purpose.[19]

It is anticipated that the systematic review will have predicted limitations that should be considered. The inconsistency of terms used in suicidology is a limiting factor regarding the search for articles and the subsequent eligibility of studies. In addition, suicide is a rare event, making the design of studies with high statistical power particularly challenging. Furthermore, people who attempt suicide are typified by poor treatment-seeking and limited adherence to treatment,[60] making it important to provide individuals at risk of suicide with appropriate and cost-effectiveness treatment options.

A limited number of available studies are expected, which explains why the search strategy prioritises sensitivity over specificity. Moreover, RCTs may not provide sufficient evidence to exclude data from non-randomised studies. The inclusion of studies examining a wide range of synchronous remote-communication technologies rather than a specific intervention is intended to address this issue. Similarly, including no restriction on the mental health condition should allow for the collection of comprehensive and relevant data. Research studies that meet eligibility criteria may have a substantial degree of heterogeneity. In response, we initially planned subgroup and subset analyses. However, the categorisation of interventions into different typologies may be difficult since multiple research studies combine several interventions simultaneously.

Aside from several limitations, there are potential strengths. The aim is to contribute to the body of evidence on suicide. The development of the research proposed in the present protocol will allow to analyse the quality and methodology used in the research of remote-based synchronous interventions for suicide prevention, synthesising scientific evidence, generating hypotheses and establishing lines of research. In addition, the study protocol per se will provide more transparency in the methods and processes involved, decrease the possibility of duplication and reduce bias. The meta-analysis of the studies found can allow the quantification of their global efficacy and effectiveness. Likewise, the subgroup or subset analyses can provide useful information to guide the design of more efficient and effective efficacy or effectiveness of remote-based synchronous programmes for suicide prevention in the future.

The current registration of the protocol for this review at PROSPERO may undergo changes, if approved by all authors. Any changes to the protocol will be described and explained in the final manuscript. The research has been previously presented at a conference and has been published as a conference abstract.[61]

ETHICS AND DISSEMINATION

Ethics approval is not needed, as systematic reviews are based on published studies. The results will be disseminated through peer-reviewed publications.

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Competing interests DP has received grants and also served as a consultant or advisor for Rovi, Angelini, Janssen, Lundbeck and Servier. The other authors declare no conflicts of interest.

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REFERENCES

1 World Health Organization. Suicide. 2021. Available: https://www.who.int/news-room/fact-sheets/detail/suicide [Accessed 30 Jan 2022].
2 World Health Organization. Suicide worldwide in 2019. 2021. Available: https://www.who.int/publications-detail-redirect/9789240026643 [Accessed 30 Jan 2022].
3 World Health Organization. Suicide in the world: global health estimates. 2019. Available: https://apps.who.int/iris/bitstream/handle/10665/326948/WHO-MSD-MER-19.3-eng.pdf?sequence=1&isAllowed=y [Accessed 30 Jan 2022].
4 Artieda-Urrutia P, Parra Uribe I, Garcia-Pares G, *et al*. Management of suicidal behaviour: is the world upside down? *Aust N Z J Psychiatry* 2014;48:399–401.
5 Mokdad AH, Forouzanfar MH, Daoud F, *et al*. Global burden of diseases, injuries, and risk factors for young people's health during 1990-2013: a systematic analysis for the global burden of disease study 2013. *Lancet* 2016;387:2383–401.
6 Parra Uribe I, Blasco-Fontecilla H, García-Parés G, *et al*. Attempted and completed suicide: not what we expected? *J Affect Disord* 2013;150:840–6.
7 Instituto Nacional de Estadística. Defunciones Según La Causa de Muerte 2017. 2021. Available: https://www.ine.es/jaxi/Datos.htm?path=/t15/p417/a2017/l0/&file=05008.px [Accessed 11 Mar 2022].
8 Zalsman G, Hawton K, Wasserman D, *et al*. Evidence-based national suicide prevention taskforce in Europe: a consensus position paper. *Eur Neuropsychopharmacol* 2017;27:418–21.
9 Olfson M, Wall M, Wang S, *et al*. Suicide following deliberate self-harm. *Am J Psychiatry* 2017;174:765–74.
10 Shand F, Vogl L, Robinson J. Improving patient care after a suicide attempt. *Australas Psychiatry* 2018;26:145–8.
11 Parra-Uribe I, Blasco-Fontecilla H, Garcia-Parés G, *et al*. Risk of re-attempts and suicide death after a suicide attempt: a survival analysis. *BMC Psychiatry* 2017;17:163.
12 Inagaki M, Kawashima Y, Yonemoto N, *et al*. Active contact and follow-up interventions to prevent repeat suicide attempts during high-risk periods among patients admitted to emergency departments for suicidal behavior: a systematic review and meta-analysis. *BMC Psychiatry* 2019;19:44.
13 Ganz D, Braquehais MD, Sher L. Secondary prevention of suicide. *PLoS Med* 2010;7:e1000271.
14 World Health Organization. The European mental health action plan 2013–2020. 2013. Available: https://www.euro.who.int/__data/assets/pdf_file/0020/280604/WHO-Europe-Mental-Health-Acion-Plan-2013-2020.pdf [Accessed 15 Feb 2022].
15 World Health Organization. Preventing suicide: A global imperative. 2014. Available: https://www.who.int/mental_health/suicide-prevention/exe_summary_english.pdf?ua=1 [Accessed 15 Feb 2022].
16 World Health Organization. Comprehensive mental health action plan 2013–2030. 2021. Available: https://apps.who.int/iris/rest/bitstreams/1371507/retrieve [Accessed 15 Feb 2022].
17 Inagaki M, Kawashima Y, Kawanishi C, *et al*. Interventions to prevent repeat suicidal behavior in patients admitted to an emergency Department for a suicide attempt: a meta-analysis. *J Affect Disord* 2015;175:66–78.
18 Zalsman G, Hawton K, Wasserman D, *et al*. Suicide prevention strategies Revisited: 10-year systematic review. *Lancet Psychiatry* 2016;3:646–59.
19 Lin T, Stone SJ, Heckman TG, *et al*. Zoom-in to zone-out: therapists report less therapeutic skill in Telepsychology versus face-to-face therapy during the COVID-19 pandemic. *Psychotherapy* 2021;58:449–59.
20 Gilat I, Shahar G. Emotional first aid for a suicide crisis: comparison between Telephonic Hotline and Internet. *Psychiatry* 2007;70:12–8.
21 Seong JM, Cho Y, Cho GC, *et al*. Effects of mobile messenger counseling on case management success for individuals engaging in self-harm or suicide attempts who were discharged from emergency departments. *Clin Exp Emerg Med* 2021;8:48–54.
22 Vijayakumar L, Umamaheswari C, Shujaath Ali ZS, *et al*. Intervention for suicide attempters: a randomized controlled study. *Indian J Psychiatry* 2011;53:244–8.
23 Cebrià AI, Parra I, Pàmias M, *et al*. Effectiveness of a telephone management programme for patients discharged from an emergency department after a suicide attempt: controlled study in a Spanish population. *J Affect Disord* 2013;147:269–76.
24 Cedereke M, Monti K, Ojehagen A. Telephone contact with patients in the year after a suicide attempt: does it affect treatment attendance and outcome? A randomised controlled study. *Eur Psychiatry* 2002;17:82–91.
25 De Leo D, Dello Buono M, Dwyer J. Suicide among the elderly: the long-term impact of a telephone support and assessment intervention in northern Italy. *Br J Psychiatry* 2002;181:226–9.
26 Fleischmann A, Bertolote JM, Wasserman D, *et al*. Effectiveness of brief intervention and contact for suicide Attempters: a randomized controlled trial in five countries. *Bull World Health Organ* 2008;86:703–9.
27 Gould MS, Munfakh JLH, Kleinman M, *et al*. National suicide prevention lifeline: enhancing mental health care for suicidal individuals and other people in crisis. *Suicide Life Threat Behav* 2012;42:22–35.
28 Miller IW, Camargo CA, Arias SA, *et al*. Suicide prevention in an emergency Department population: the ED-SAFE study. *JAMA Psychiatry* 2017;74:563–70.
29 Mousavi SG, Zohreh R, Maracy MR, *et al*. The efficacy of Telephonic follow up in prevention of suicidal Reattempt in patients with suicide attempt history. *Adv Biomed Res* 2014;3:198.
30 Vaiva G, Vaiva G, Ducrocq F, *et al*. Effect of telephone contact on further suicide attempts in patients discharged from an emergency department: randomised controlled study. *BMJ* 2006;332:1241–5.
31 Cebria AI, Pérez-Bonaventura I, Cuijpers P, *et al*. Telephone management program for patients discharged from an emergency department after a suicide attempt. *Crisis* 2015;36:345–52.
32 Milner AJ, Carter G, Pirkis J, *et al*. Letters, green cards, telephone calls and postcards: systematic and meta-analytic review of brief contact interventions for reducing self-harm, suicide attempts and suicide. *Br J Psychiatry* 2015;206:184–90.
33 Noh D, Park YS, Oh EG. Effectiveness of telephone-delivered interventions following suicide attempts: a systematic review. *Arch Psychiatr Nurs* 2016;30:114–9.
34 Luxton DD, June JD, Comtois KA. Can postdischarge follow-up contacts prevent suicide and suicidal behavior? A review of the evidence. *Crisis* 2013;34:32–41.
35 Bertolote JM, Fleischmann A, De Leo D, *et al*. Repetition of suicide attempts: data from emergency care settings in five culturally different low- and middle-income countries participating in the WHO SUPRE-MISS study. *Crisis* 2010;31:194–201.
36 Mouaffak F, Marchand A, Castaigne E, *et al*. OSTA program: a French follow up intervention program for suicide prevention. *Psychiatry Res* 2015;230:913–8.
37 Krysinska KE, De Leo D. Telecommunication and suicide prevention: hopes and challenges for the new century. *Omega* 2007;55:237–53.
38 Higgins JPT, Thomas J, Chandler J, *et al*. Cochrane Handbook for systematic reviews of interventions version 6.2. 2021. Available: https://training.cochrane.org/handbook [Accessed 30 Jan 2022].

39 Moher D, Shamseer L, Clarke M, *et al*. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;4:1.
40 Shamseer L, Moher D, Clarke M, *et al*. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ* 2015;350:g7647.
41 Holly C, Salmond S, Saimbert M. *comprehensive systematic review for advanced practice Nursing*. In: *Developing clinical questions for a systematic review*. New York, NY: Springer Publishing Company, 2021: 85–101.
42 Gómez A, Silva HAmonR*et al*. *Teoría, Clínica y Manejo*. Barcelona, ES: Editorial Mediterráneo, 2018.
43 World Health Organization. ICD-11 for mortality and morbidity Statistics. 2021. Available: https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/778734771 [Accessed 15 Feb 2022].
44 Andreotti ET, Ipuchima JR, Cazella SC, *et al*. Instruments to assess suicide risk: a systematic review. *Trends Psychiatry Psychother* 2020;42:276–81.
45 McGowan J, Sampson M, Salzwedel DM, *et al*. PRESS peer review of electronic search strategies: 2015 guideline statement. *J Clin Epidemiol* 2016;75:40–6.
46 Amezcua M. La Búsqueda Bibliográfica en Diez Pasos. *Index Enferm* 2015;24:14.
47 Rada G G, Andrade A M, Leyton Sch V, *et al*. Búsqueda de información en medicina basada en evidencia. *Rev Méd Chile* 2004;132:253–9.
48 Ouzzani M, Hammady H, Fedorowicz Z, *et al*. Rayyan-a web and mobile App for systematic reviews. *Syst Rev* 2016;5:210.
49 Moher D, Liberati A, Tetzlaff J, *et al*. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Int J Surg* 2010;8:336–41.
50 The Cochrane Collaboration. Data collection form for intervention reviews for Rcts and non-Rcts – template. 2019. Available: https://dplp.cochrane.org/data-extraction-forms [Accessed 30 Feb 2022].
51 Sterne JAC, Savović J, Page MJ, *et al*. Rob 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019;366:l4898.
52 Sterne JA, Hernán MA, Reeves BC, *et al*. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *BMJ* 2016;355:i4919.
53 Hedges LV. Distribution theory for glass's estimator of effect size and related estimators. J Educ Stat 1981;6:107.
54 Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. New York, US: Lawrence Erlbaum Associates, 1988.
55 Egger M, Davey Smith G, Schneider M, *et al*. Bias in meta-analysis detected by a simple, graphical test. *BMJ* 1997;315:629–34.
56 Liu JL. The role of the funnel plot in detecting publication and related biases in meta-analysis. *Evid Based Dent* 2011;12:121–2.
57 Shi L, Lin L. The trim-and-fill method for publication bias: practical guidelines and recommendations based on a large database of meta-analyses. *Medicine* 2019;98:e15987.
58 Schünemann H, Brożek J, Guyatt G, *et al*. GRADE Handbook for grading quality of evidence and strength of recommendations [online]. 2013. Available: https://gdt.gradepro.org/app/handbook/handbook.html [Accessed 30 Feb 2022].
59 Ryan R, Hill S. How to GRADE the quality of the evidence. Cochrane Consumers and Communication Group; 2016. Available: https://cccrg.cochrane.org/author-resources [Accessed Feb 2022].
60 Bruffaerts R, Demyttenaere K, Hwang I, *et al*. Treatment of suicidal people around the world. *Br J Psychiatry* 2011;199:64–70.
61 Comendador Vázquez L, Cebrià Meca A, Sanz Ruíz A, *et al*. Efficacy of synchronous remote-based interventions for suicide prevention among adolescent and adult patients: a systematic review and meta-analysis. *Eur Psychiatr* 2022;65:S295–6.
62 Beck AT, Kovacs M, Weissman A. Assessment of suicidal intention: the scale for suicide Ideation. *J Consult Clin Psychol* 1979;47:343–52.
63 Posner K, Brent D, Lucas C, *et al*. *Columbia-Suicide Severity Rating Scale (C-SSRS)*. New York, USA: Columbia University Medical Center, 2008.
64 Beck AT, Schuyler D, Herman I. Development of suicidal intent scales. In: Beck AT, Resnik HLP, Lettieri DJ, eds. *The Prediction of Suicide*. Philadelphia, PA: Charles Press, 1974: 45–56.
65 Fonseca-Pedrero E, Pérez de Albéniz A, Universidad de La Rioja. Programa Riojano de Investigación en Salud Mental (PRISMA). Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Universidad de Oviedo, *et al*. Evaluación de la Conducta Suicida en Adolescentes: A Propósito de la Escala Paykel de Suicidio. *Pap Psicol* 2020;41:106–15.
66 Beck AT, Steer RA. *Manual for the Beck scale for suicide ideation*. San Antonio, TX: Psychological Corporation, 1991.
67 Reynolds WM. *Suicidal ideation questionnaire (SIQ)*. Odessa, UKR: Psychological Assessment Resources, 1987.
68 Sheehan DV, Lecrubier Y, Sheehan KH, *et al*. The mini-International neuropsychiatric interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry* 1998;59 Suppl 20:22–33.
69 Horowitz LM, Wang PS, Koocher GP, *et al*. Detecting suicide risk in a pediatric emergency Department: development of a brief screening tool. *Pediatrics* 2001;107:1133–7.
70 Innamorati M, Pompili M, Lester D, *et al*. Recreational drug use and Suicidality among Italian young adults. *J Addict Dis* 2008;27:51–9.
71 Domino G, Moore D, Westlake L, *et al*. Attitudes toward suicide: a factor analytic approach. *J Clin Psychol* 1982;38:257–62.
72 Kessler RC, Ustün TB. The world mental health (WMH) survey initiative version of the world health Organization (WHO) composite International diagnostic interview (CIDI). *Int J Methods Psychiatr Res* 2004;13:93–121.
73 Lindenmayer JP, Czobor P, Alphs L, *et al*. The Intersept scale for suicidal thinking reliability and validity. *Schizophr Res* 2003;63:161–70.
74 Koslowsky M, Bleich A, Greenspoon A, *et al*. Assessing the validity of the plutchik suicide risk scale. *J Psychiatr Res* 1991;25:155–8.
75 Friedman JMH, Asnis GM. Assessment of suicidal behavior: a new instrument. *Psychiatric Annals* 1989;19:382–7.
76 Cull JG, Gill WW. *Suicide Probability Scale (SPS) Manual*. Los Angeles, USA: Western Psychological Services, 1988.

PRISMA-P 2015 Checklist

This checklist has been adapted for use with protocol submissions to *Systematic Reviews* from Table 3 in Moher D et al: Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews* 2015 **4**:1

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
ADMINISTRATIVE INFORMATION					
Title					
Identification	1a	Identify the report as a protocol of a systematic review	☒	☐	1-2
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	☐	☒	N/A
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number in the Abstract	☒	☐	24
Authors					
Contact	3a	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author	☒	☐	Title page
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	☒	☐	390-394
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	☐	☒	N/A
Support					
Sources	5a	Indicate sources of financial or other support for the review	☒	☐	408-419
Sponsor	5b	Provide name for the review funder and/or sponsor	☒	☐	408-419
Role of sponsor/funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	☒	☐	416-419
INTRODUCTION					
Rationale	6	Describe the rationale for the review in the context of what is already known	☒	☐	39-112
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	☒	☐	124-129
METHODS					

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review	☒	☐	131-191 216-219
Information sources	9	Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage	☒	☐	192-203 216
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	☒	☐	Supplementary File 2
STUDY RECORDS					
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	☒	☐	226-231
Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	☒	☐	233-243
Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	☒	☐	245-250
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sources), any pre-planned data assumptions and simplifications	☒	☐	252-258
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	☒	☐	174-191
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	☒	☐	260-269
DATA					
Synthesis	15a	Describe criteria under which study data will be quantitatively synthesized	☒	☐	273-275 285 - 299
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I^2, Kendall's tau)	☒	☐	292-299
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-regression)	☒	☐	301-303
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	☒	☐	272-275

Section/topic	#	Checklist item	Information reported		Line number(s)
			Yes	No	
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective reporting within studies)	☒	☐	327-329
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	☒	☐	331-334

Supplementary File 2. PubMed search strategy

Search strategy

("suicide"[MeSH Terms] OR suicid*[Title] OR "suicidal ideation"[MeSH Terms] OR "suicide ideation"[Title] OR "suicide, attempted"[MeSH Terms] OR "attempted suicide"[Title] OR "suicidal behavio*"[Title] OR "non-fatal attempt"[Title] OR "unsuccessful attempt"[Title] OR "suicide, completed"[MeSH Terms] OR "completed suicide"[Title] OR "fatal attempt"[Title] OR "self-injurious behavior"[MeSH Terms] OR self-injur*[Title] OR self-harm*[Title] OR "self-destructive behavio*"[Title] OR self-poisoning[Title] OR "repeated suicide"[Title] OR suicide-risk[Title])

AND ("treatment outcome"[MeSH Terms] OR treatment[Title/Abstract] OR therap*[Title/Abstract] OR intervention*[Title/Abstract] OR "crisis intervention"[MeSH Terms] OR prevention[Title/Abstract] OR "follow-up studies"[MeSH Terms] OR follow-up[Title/Abstract] OR contact*[Title/Abstract] OR management[Title/Abstract] OR program*[Title/Abstract] OR "psychotherapy, brief"[MeSH Terms] OR "brief psychotherap*"[Title/Abstract] OR "brief contact intervention*"[Title/Abstract] OR "post-discharge intervention*"[Title/Abstract] OR effectiv*[Title/Abstract] OR efficacy[Title/Abstract])

AND (synchron*[Title/Abstract] OR "online systems"[MeSH Terms] OR real-time[Title/Abstract] OR "immediate communication*"[Title/Abstract] OR "remote consultation"[MeSH Terms] OR remote*[Title/Abstract] OR non-presential[Title/Abstract] OR non-face-to-face[Title/Abstract] OR non-attend*[Title/Abstract] OR "distance counseling"[MeSH Terms] OR distance[Title/Abstract] OR digital[Title/Abstract] OR "telemedicine"[MeSH Terms] OR telemedicine[Title/Abstract] OR "telecommunications"[MeSH Terms] OR "telecommunication*"[Title/Abstract] OR telehealth[Title/Abstract] OR teleassistance[Title/Abstract] OR telepsychology[Title/Abstract] OR telepsychiatry[Title/Abstract] OR telecare[Title/Abstract] OR telemonitoring[Title/Abstract] OR teleconsult*[Title/Abstract] OR telecounsel*[Title/Abstract] OR "telemental health"[Title/Abstract] OR online[Title/Abstract] OR on-line[Title/Abstract] OR "information and communication technolog*"[Title/Abstract] OR ICT[Title/Abstract] OR e-therap*[Title/Abstract] OR "electronic therap*"[Title/Abstract] OR e-health[Title/Abstract] OR "electronic health"[Title/Abstract] OR m-health[Title/Abstract] OR "mobile health"[Title/Abstract] OR "telephone"[MeSH Terms] OR telephon*[Title/Abstract] OR "cell phone"[MeSH Terms] OR phone*[Title/Abstract] OR "phone call*"[Title/Abstract] OR call*[Title/Abstract] OR "telephone contact*"[Title/Abstract] OR "hotlines"[MeSH Terms] OR hotline*[Title/Abstract] OR "hot line service*"[Title/Abstract] OR "call centers"[MeSH Terms] OR helpline*[Title/Abstract] OR lifeline*[Title/Abstract] OR "suicide prevention lifeline"[Title/Abstract] OR "crisis line*"[Title/Abstract] OR video*[Title/Abstract] OR "videoconferencing"[MeSH Terms] OR video-call*[Title/Abstract] OR "clinical videoconferencing"[Title/Abstract] OR CVT[Title/Abstract] OR chat*[Title/Abstract] OR chatbot[Title/Abstract] OR "text messaging"[MeSH Terms] OR "text messaging"[Title/Abstract] OR "instant messag*"[Title/Abstract] OR SMS[Title/Abstract] OR "mobile applications"[MeSH Terms] OR "mobile application*"[Title/Abstract] OR App[Title/Abstract] OR "phone application*"[Title/Abstract])

AND (“randomized controlled trials as Topic”[Mesh] OR “randomized controlled trial”[Title/Abstract] OR “controlled clinical trials as Topic”[Mesh] OR “controlled clinical trial”[Title/Abstract] OR trial*[Title/Abstract] OR "clinical studies as Topic"[MeSH Terms] OR

"clinical stud*"[Title/Abstract] OR "random allocation"[MeSH Terms] OR random*[Title/Abstract] OR "intervention group*"[Title/Abstract] OR "control group*"[Title/Abstract])

NOT (systematic review*[Title] OR review*[Title] OR meta*[Title] OR protocol[Title])

Filters

The following filters were applied: text availability (Full text), language (English, Spanish), age (Adolescent: 13-18 years, Adult: 19+ years).