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Text-based Psychological Crisis Intervention: A Systematic Review (2007 – 2023)

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MESTRADO EM PSICOLOGIA NA CRISE E NA EMERGÊNCIA

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“Sempre chegamos onde mais nos esperam.”
- José Saramago

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Resumo

Com o aumento na prevalência de perturbações na área da saúde mental (como a ansiedade e a depressão) em todo o mundo, a expansão da tecnologia digital abriu caminho para formas inovadoras de oferecer apoio psicológico. O COVID-19 acelerou o desenvolvimento e o uso destas novas tecnologias na área da saúde, especialmente na saúde mental. Este rápido desenvolvimento tecnológico também teve um impacto nos serviços de intervenção em crise, aumentando a procura no apoio psicológico à distância e oferecendo novas formas de ajudar as pessoas. A intervenção em crise, expandiu assim ainda mais para meios de comunicação remotos, como por chamada telefónica ou por mensagens escritas (chats online ou mensagens de texto).

A intervenção em crise por mensagem apresenta vantagens como ser grátis/ baixo-custo, disponibilidade imediata, anonimato, confidencialidade, acessibilidade através de qualquer localização, entre outros. Este tipo de ajuda tipicamente está disponível através linhas de ajuda que funcionam 24 horas por dia, oferecendo suporte para uma diversidade de preocupações do foro psicológico (incluindo psicopatologia agudizada ou vivência de um evento potencialmente traumático). Revisões sistemáticas prévias mostram um impacto positivo a curto prazo da intervenção em crise por mensagem, mas não reúnem evidências especificamente para a intervenção em crise através de mensagem escrita em crise psicológica.

Deste modo, este estudo trata-se de uma revisão sistemática que tem por objetivo reunir evidência acerca da viabilidade e eficácia da intervenção síncrona por mensagem escrita durante crises psicológicas (chat online e mensagens SMS). Com esse fim, visámos descrever em detalhe quem são os usuários destes serviços de crise por mensagem escrita no que refere as suas características demográficas e clínicas, o impacto clínico destas intervenções e como se comparam a outros modos de intervenção com eficácia comprovada (i.e., chamada telefónica). Esta revisão ajudará assim a avançar o conhecimento no que concerne como é que estas intervenções psicológicas em crise por mensagem são aplicadas, qual é a sua eficácia e como podem contribuir para informar a prática clínica e as políticas no que toca à expansão de serviços de crise para estas novas modalidades.

Seguindo as diretrizes PRISMA para revisão, análise e descrição de resultados de um modo sistemático, começámos por recolher informação em bases de dados científicas, incluindo a PubMed, Web of Science Core Collection e Scopus. As palavras-chave

utilizadas para esta pesquisa incluíram termos relacionados com intervenção em crise (e.g., *acute psychological intervention*) juntamente com termos relacionados com meios de comunicação escritos (e.g., *text-line*). As combinações dos termos de busca foram traduzidas e adaptadas dependendo das especificações da base de dados científica. No processo inicial de triagem, identificámos um total de 464 artigos publicados em revistas submetidas a processo de revisão por pares, que fossem relevantes para as nossas questões de investigação. Após a remoção de artigos duplicados com base nos critérios de inclusão e exclusão definidos previamente à pesquisa, 328 artigos foram excluídos durante o processo de avaliação do título e resumo, e 28 durante o processo de avaliação do artigo na sua extensão. No final, um total de 22 artigos cumpriram os critérios de elegibilidade e foram incluídos na revisão. Outros 8 artigos foram recuperados através de revisão bibliográfica, totalizando 30 artigos incluídos para síntese e análise. Estes estudos incluíram uma diversidade de contextos de crise, entre suicídio, preocupações múltiplas do foro da saúde mental, agressão sexual, COVID-19 e maus-tratos infantis, bem como diferentes designs de estudo.

Os nossos resultados mostram que estas linhas de ajuda em crise que oferecem apoio através de mensagem escrita parecem ser utilizadas predominantemente por populações mais jovens e do sexo feminino. Os contextos de crise abordados por estas linhas de ajuda são diversos, incluindo suicídio, violência sexual, COVID-19, negligência e abuso de menores, e preocupações múltiplas do foro da saúde mental.

A aderência a estas linhas de ajuda é positiva, com usuários a reportarem altos níveis de satisfação no atendimento, e considerando este tipo de serviço útil para situações de crise psicológica devido ao seu fácil acesso e disponibilidade imediata. Relativamente à eficácia, os resultados sustentam que a intervenção psicológica em crise por mensagem escrita tem um impacto clínico positivo, reduzindo o sofrimento psicológico, risco de suicídio e stress. A prevalência de linhas de ajuda por mensagem escrita direcionadas a prevenção de suicídio é elevada nesta revisão (43%), mostrando o papel importante que este meio de comunicação pode ter na ideação e intenção suicida. No entanto, esta evidência da eficácia deve ser cuidadosamente considerada, já que a amostra de estudos incluída que reporta impacto clínico é limitada e apresenta inconsistências entre estudos na forma como medem e reportam o impacto clínico. Alguns estudos também caracterizam a relação entre impacto clínico e outros fatores, relatando resultados interessantes como uma maior correlação entre qualidade da intervenção e o número de palavras trocadas entre o indivíduo em crise e o operador, ao invés do tamanho das

mensagens. Apresentando assim resultados mais positivos quando os operadores das linhas de ajuda exploram mais os recursos e possíveis soluções colaborativamente com quem está em crise. Quanto a como as intervenções psicológicas em crise por mensagem escrita e por chamada telefónica se comparam, não parecem existir diferenças notáveis, ambas reduzindo o sofrimento psicológico do indivíduo. Ainda que mais uma vez a amostra de estudos que compare estas duas variáveis seja limitada.

Esta revisão contribui assim para uma descrição mais abrangente de intervenções em crise por mensagem no que concerne a saúde mental, da sua eficácia e impacto clínico em sintomas, e como se compara a outras modalidades de intervenção (i.e., chamada telefónica). Os nossos resultados quanto à sua eficácia são mistos, devido à falta de estandardização nas medidas e descrições dos resultados. No entanto, apesar de limitações no rigor metodológico, a evidência converge para a intervenção psicológica em crise por mensagem escrita aliviar sintomas durante uma agudização da sintomatologia psicopatológica (e.g., ideação suicida) ou eventos potencialmente traumáticos (e.g., violência sexual). No seguimento desta linha de investigação, existe necessidade de mais pesquisa acerca da eficácia da intervenção em crises por mensagem a curto e longo-prazo, incluindo quais os contextos que podem adicionar mais valor na melhoria de sintomas psicológicos. Outras direções futuras incluem explorar diferenças entre os dois meios de intervenção em crise que existem para comunicar de forma escrita (mensagem SMS vs. chat online), indagando em maior profundidade se o facto de os usuários destas linhas de ajuda serem maioritariamente jovens é resultante do tipo de intervenção em si, ou de uma maior literacia de saúde mental (que caracteriza estas populações) promover a procura de ajuda independentemente do meio de comunicação utilizado. Esta revisão contribui também melhor informar a prática clínica e políticas de expansão de intervenção em crise para estas novas modalidades na área pública da saúde. Examinando assim como e em que circunstâncias a intervenção psicológica em crise por mensagem escrita pode ser melhor utilizada no setor de saúde pública mental, e quais os possíveis constrangimentos que podem surgir aquando da sua implementação.

Com o rápido crescimento de novas tecnologias, a capacidade de oferecer cuidados de saúde mental remotamente, como é o caso de intervenção psicológica em crise por mensagem escrita, continuará a expandir e transformar os serviços de saúde mental.

Palavras-chave: intervenção em crise por mensagem, intervenção em crise por chat, saúde mental, revisão sistemática.

Abstract

As mental health concerns have been witnessed to increase worldwide, the expansion of technology has paved the way for innovative ways to offer psychological support to those in crisis, such as via written conversations (online chats or text messages).

The aim of this systematic review was to evaluate the current evidence on the feasibility and effectiveness of text-based synchronous intervention in psychological crisis, including online chat and text messaging. To this end, we comprehensively described texters on their demographic and clinical characteristics, the impact on clinical outcomes of these interventions, and how these interventions compare to other provenly effective intervention, like through phone call.

Database searches on PubMed, Web of Science Core Collection and Scopus identified a total of 464 articles published in peer-reviewed journals that were relevant to the subject. An additional 8 articles were retrieved through bibliographical review. We followed PRISMA guidelines for systematically reviewing, analysing and reporting data.

Of the 464 articles screened, a total of 30 articles met the eligibility criteria and were included in the review. The articles included a wide range of crisis contexts (suicide, multiple mental health concerns, sexual assault, COVID-19 and child maltreatment) and study designs. Text-based crisis services seem to be predominantly used by youth (adolescents and young adults) and females. Evidence shows text-based crisis intervention demonstrates effectiveness on reducing psychological distress and suicidal risk, though high-quality studies reporting on this are lacking. Moreover, no notable differences seem to exist when comparing phone call to text-based crisis interventions.

Most of our described findings contribute to a comprehensive description of text-based crisis interventions in mental health on what concerns the texters/ chatters, its effectiveness and impact on clinical outcomes, and how it compares to other modalities (i.e., via phone call). This review reveals there's a need for further research on the effectiveness of text-based crisis of intervention and to which extent it may improve psychological symptoms. Our research may also contribute to helping inform clinical practice and policy development on how to safely expand crisis intervention to this modality.

Keywords: text-based crisis intervention, chat-based crisis intervention, mental health, systematic review.

1. Introduction

1.1 Definition of crisis

With mental health concerns on the rise worldwide, the expansion of technology has paved the way for innovative ways to offer psychological support to those in crisis.

A crisis is a transient abrupt disruption of a person's psychological equilibrium, with their distress exceeding their ability to cope (Roberts & Ottens, 2005; Yeager & Roberts, 2015). Mental health crisis or potentially traumatic events (PTE), like the unexpected death of a close relative or a natural disaster, may have a deep psychological impact in the person's psychological functioning in the moment and long-term as they threaten their physical or emotional health (American Psychiatric Association, 2013; Roberts & Ottens, 2005). The prevalence of experiencing a PTE is high in the general population over the course of a lifespan (Corthésy-Blondin et al., 2022). Exposure to PTEs has been associated with an increased risk of psychiatric disorders like post-traumatic stress disorder (PTSD), generalized anxiety disorder, panic disorder, borderline personality disorder, psychosis, depression, and problematic alcohol and drug use (Overstreet et al., 2017). But contrary to popular belief, most individuals in the population do have the resources to cope with the impact and suffering caused by a crisis, not developing PTSD and other stress-related psychiatric disorders after (Bonanno et al., 2007; Bonanno et al., 2024). The most important aspect of a psychological crisis is not the event itself but how the person experiences the event and the resources (both internal and external) they have to cope with it (da Silva et al., 2015).

1.2 Crisis intervention

Approaching a psychological crisis in the moment or right after it happens, plays an important role to mitigate its impact and integrate it in the person's life, reducing the chance of developing PTSD or other stress-related disorders (Puleo & McGlothlin, 2010; Roberts & Ottens, 2005). Hence, the goals of a crisis intervention include stabilizing and mitigating the individuals' symptoms of acute distress, restoring a more balanced psychological functioning and promoting the return to an adaptive level of functioning (Everly & Lating, 2019).

Multiple models of crisis intervention have been proposed, from more general (e.g., *7-Stage Crisis Model*; Roberts & Ottens, 2005) to more specific approaches (e.g., *Zero Suicide Model*; Brodsky et al., 2018). Two of the most significant contributions due to

their comprehensive frameworks and practical guidance for crisis intervention are the 7-Stage Crisis Model (Robert & Ottens, 2005) and the 5 Crisis Intervention Principles (Hobfoll et al., 2007). The 7 Stage Crisis Model delineates a framework to respond to crisis that is composed of seven stages: planning and conducting a thorough biopsychosocial and crisis assessment (including suicidal and homicidal risk and need for medical attention), making a first contact and establishing rapport with the person in crisis, examining and defining the issues and challenges of the crisis, encouraging the exploration of feelings and emotions, exploring past positive coping strategies and alternatives, implementing an action plan by identifying social support network and referral resources and lastly, establishing a follow-up plan to determine their well-being in the aftermath (Roberts & Ottens, 2005). Likewise, the 5 Crisis Intervention Principles offer empirical foundational guidelines for effective crisis intervention. The principles include promoting a sense of safety, promoting calming in individuals in distress, promoting a sense of self-efficacy and collective efficacy, promoting connectedness and instilling hope (Hobfoll et al., 2007).

There are also other crisis intervention models that are highly regarded and applied depending on the specific needs of the people and communities in crisis. To a large extent, these models are applied in face-to-face interventions and although this method elicits positive outcomes, it is not always a possibility (Lester, 2002).

1.3. Text-based crisis helplines

Evidence spanning over 45 years has shown crisis intervention through phone call is effective for providing immediate support to individuals in distress, helping reduce some of their symptoms (Hvidt et al., 2016). While in the past remote crisis support services communicated mostly through phone call, with the expansion of new technologies, internet chats, text messaging, and social media platforms have gained traction as we've increased the use of mobile phones for social communication (Predmore et al., 2017; Sefi & Hanley, 2012). These new technologies can be used as online psychological treatments or crisis intervention tools, extending services from phone call to text message and online chats (Coady et al., 2022; da Silva et al., 2015; Sindahl & van Dolen, 2020). Text and online chat both allow sending written messages in real time (i.e., synchronous), only differing on whether internet connection is needed. On online chats, communication takes place through web-based messaging platforms or apps like

WhatsApp, WeChat or crisis helplines (Brody et al., 2020), while text messaging involves sending SMS text messages via mobile phone (Goodman, 2020).

Crisis interventions through phone call, text and chat usually occur through helplines, which are typically available 24 hours a day every day of the week and are commonly used to support people who need assistance for a variety of issues (including psychological distress) (WHO, 2018). The COVID-19 pandemic highlighted the significant role digital technology plays in accessing mental health treatments, becoming an essential service (Feinstein, 2021). This further expanded delivering healthcare through digital and remote services, such as telepsychiatry, online counselling sessions or even early psychological trauma intervention (da Silva et al., 2015; Feinstein, 2021). Some of these text-based services have incorporated techniques of psychological first aid and suicide prevention, which have been shown useful in mitigating psychological distress in some populations (Pospos et al., 2018). To note, when we refer text-based we are including both text and online chat in this definition. Crisis text services were already increasing in popularity since 2013 and online chats have followed suit more recently (Goodman, 2020). But both seem to have largely increased in use since the COVID-19 pandemic (Coady et al., 2022). Importantly, text and chat services aren't intended to replace phone calls and face-to-face interventions, but to complement them by promoting a greater access and convenience towards getting help, especially in areas where access to other more traditional services may be restricted (Finn & Hughes, 2008).

Similar to crisis intervention over phone call, text and chat modalities present advantages on being free/ low-cost, immediate, anonymous, accessible from anywhere, not requiring finding a private space, the possibility of being translated to other languages, and serving as an important first step towards future help (Brody et al., 2020; Feinstein, 2021; Goodman, 2020; Mazzer et al., 2021; Sindahl et al., 2019). Because crisis does not choose a time or place, these interventions high geographic reach and free/low-cost instant access to aid are beneficial (da Silva et al., 2015). This type of intervention also encourages autonomy, reducing the dependency and support on the helper (WHO, 2018). Anonymity has been found to facilitate openness and self-disclosure, while helper's anonymity can more easily shape the helper into what the person reaching out needs (Dadfar & Lester, 2021; Lester, 2002). Being able to translate messages to other languages, makes it possible for an international audience to reach out for help even if they aren't fluent in a language (Goodman, 2020). Its users also have more control over the pace of the conversations and may feel more comfortable to share thoughts and

feelings that they may be hesitant to say aloud (Brody et al., 2020). There are drawbacks to these modalities too, including difficulties in assessing nonverbal cues through written communication (which is sometimes important when assessing risk to self-harm or harm others), and potential miscommunication due to the lack of visual or auditory cues (Erbe et al., 2017).

Research indicates that older teens and emerging adults prefer text-based communication when it comes to receiving information and communicating in their relationships (Auxier & Anderson, 2021; Lenhart et al., 2015). Text messaging and online chat crisis intervention has been indicated as especially useful for helping at-risk children, adolescents, and young adults address issues like suicidality or even supporting them through anxiety, depression and stress (Cox et al., 2021; Dowling and Rickwood, 2013; Mishara & Côté, 2013; da Silva et al., 2015; Runkle et al., 2021). Evidence from a systematic review demonstrated the impact of crisis lines (including phone call, text and chat) on mental health symptoms, reducing psychological distress immediately on the short-term, especially with high suicide-risk populations (Hoffberg et al., 2020). For long-term outcomes on mental health symptoms, there's limited evidence (Crawford, 2021). The recent traction of text-based services may prompt the question on whether they are as effective as other proven crisis interventions, like via phone call (Hvidt et al., 2016). Initial findings seem to find no differences, with both phone call and text-based interventions (i.e., text message and online chat) being equally effective (Goodman, 2020).

Past systematic reviews have evaluated psychological interventions deployed through text and found evidence to support its use (Dowling & Rickwood, 2013; Hoermann et al., 2017). And recent evidence from reviews on crisis lines shows they've been expanding to text and chat modalities to improve access to mental health services (Hoffberg et al., 2020; Matthews et al., 2023). Findings indicate there is a positive short-term impact of remote crisis intervention (phone, text and online chat) but also conclude there's a need for more rigorous evaluation of these crisis services (Hoffberg et al., 2020; Matthews et al., 2023). While reviews have been conducted on psychological intervention using synchronous text-based communication (Dowling & Rickwood, 2013; Hoermann et al., 2017) and on crisis lines in general (Hoffberg et al., 2020; Matthews et al., 2023), evidence for psychological crisis intervention through text-based communication has not been systematically reviewed. This will advance understanding the research evidence on how these crisis interventions are being applied, how well they support people facing

psychological crisis and help inform clinical practice and policy on expanding crisis services to these modalities.

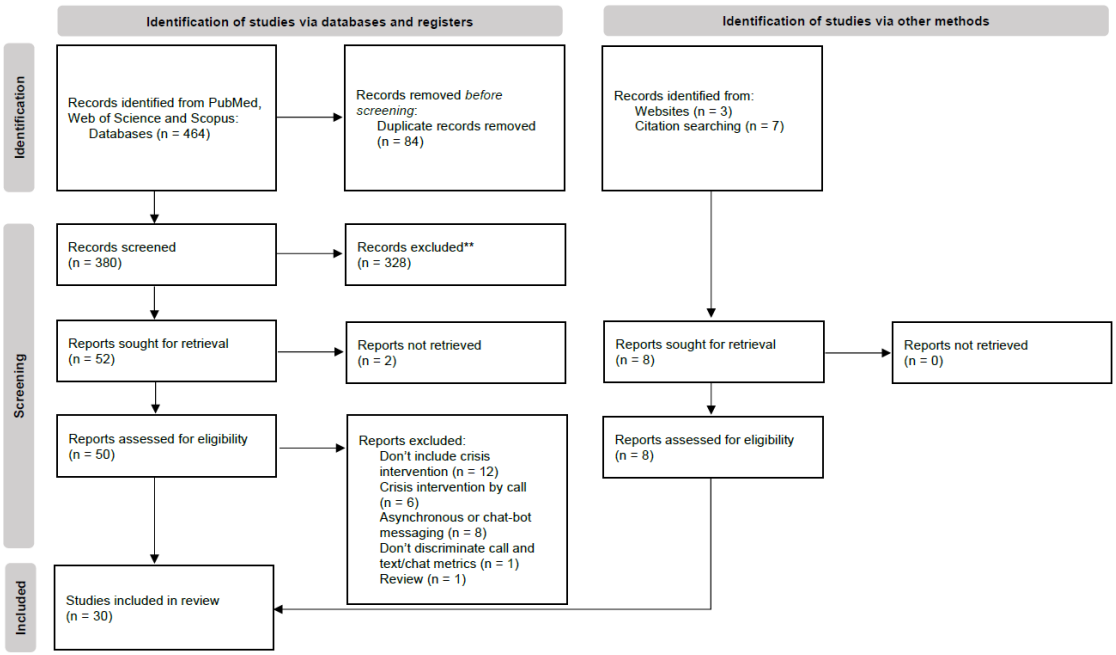
We hope our review will serve to evaluate the current evidence on the feasibility and effectiveness of text-based intervention in mental health, including online chat and text messaging. Our main aims were to comprehensively describe the texters/ chatters on their demographic and clinical characteristics, and to evaluate the impact on clinical outcomes of these interventions with individuals in distress. For this effect, we conducted a systematic review by evaluating peer-reviewed published literature over the past 16 years, from 2007 to 2023.

2. Methodology

This systematic review adhered to the PRISMA guidelines for systematic reviews and meta-analysis (Liberati et al., 2009), as shown in Figure 1.

Figure 1

Flowchart showing the process of selection of studies for the systematic review according to the PRISMA guidelines



2.1 Literature research

To identify experimental studies examining chat-based psychological crisis intervention, we conducted our first search in March 2023, using PubMed, Web of

Science Core Collection and Scopus databases. We used the query: “crisis intervention” OR “emotional first aid” OR “psychological crisis intervention” OR “psychological crises intervention” OR “emergency psychological intervention” OR “acute psychological intervention” AND “chat-based” OR “facebook messenger” OR “WhatsApp” OR “weChat” OR “instant messenger” OR “online hotline” OR “online chat” OR “chat” OR “message” OR “text-line”. This query was translated according to the specifications of each database. To mitigate research bias and to avoid missing any relevant studies, we relied on several databases and on a broad query. Two additional research rounds were conducted in June 2023 and September 2023, to identify more recent eligible articles.

2.2 Selection criteria

Studies that met the following criteria were selected: published in English, Spanish or Portuguese on a peer-reviewed journal; full-text available online; includes individuals experiencing a psychological crisis; directly related to psychological crisis intervention through text or chat; and intervention done in real time by a trained psychologist or volunteer.

Exclusion criteria included review articles, prevention studies, editorials and opinion pieces; no individuals facing a psychological crisis; lack of psychological crisis intervention through text or chat; focus on the well-being of the professionals responding to the crisis intervention; intervention was done asynchronously or by a chat-bot; professionals lacking any type of crisis intervention training; when comparing between text/ chats and phone call interventions, outcomes not being presented and discussed separately; and full-text versions of the article not being accessible.

No articles were excluded based on their study design except for reviews, prevention studies, editorials and opinion pieces or if the manuscript wasn’t published in a peer-reviewed journal. All descriptive, quasi-experimental, experimental studies were included in the analysis if well-documented.

Titles and abstracts were screened by a single reviewer and the same process repeated after for reviewing the full-texts of all potentially eligible studies, where eligibility was assessed against the inclusion and exclusion criteria. Table 1 indicates in further detail each of the inclusion and exclusion criteria applied. This process was repeated by the same reviewer after 6 months to ensure the final sample of articles was reliably selected. To note, repeating the process ensured the same results.

Table 1

Inclusion and exclusion criteria for selecting the studies in this systematic review

Criterion	Inclusion criteria	Exclusion criteria
Population	Involves individuals experiencing a psychological crisis.	No individuals experiencing a psychological crisis. Focus on the well-being of the professionals responding to the crisis intervention.
Intervention	Directly related to psychological crisis intervention through text or chat. Intervention was done in real time by a trained psychologist or volunteer.	No psychological crisis intervention through text or chat. Intervention was done asynchronously or not by a human (e.g., chat-bot).
Study Design	Peer-reviewed articles with a descriptive, quasi-experimental or experimental study design.	Non-peer reviewed articles, reviews, prevention studies, editorials and opinion pieces.
Comparison	When comparing text/ chat and phone call interventions, the outcomes were presented and discussed separately.	Outcomes from texts/chats and calls interventions weren't presented and discussed separately.
Helpline Responders	Helpline responders were provided training in crisis intervention.	Helpline responders lacked any type of crisis intervention training.
Language	Published in English, Spanish or Portuguese.	Published in languages other than English, Spanish or Portuguese.
Full-text availability	Full-text article is available online.	Full-text versions of the article not being accessible.

2.3 Data extraction

A single reviewer who screened the studies for eligibility also extracted the following information from each study: authors, title, year, location, aim of the study, methodology, specific crisis context, crisis intervention model, population, text support medium (text vs. online chat vs. text and online chat), helpline functioning times, responder crisis intervention training, characteristics of texters (demographically and clinically), clinical outcomes of the intervention (efficacy), comparison between text and other types of crisis intervention (e.g., call), conclusions of the study, recommendations made by the authors (research and clinical recommendations). When the required data were neither available nor could be obtained from the authors, the study was either excluded (n = 2) or kept if it provided useful information.

2.4 Data synthesis

Upon reviewing the selected studies, it became evident that text-based psychological crisis interventions are multifaceted. The qualitative synthesis aimed to identify common themes, patterns and trends across studies, considering the various populations, intervention types, and outcome measures used. The analysis focused on the following themes: characterizing the texters/ chatters demographically and clinically, assessing the effectiveness of the text or chat helpline, and comparing between call and text crisis interventions.

3. Results

3.1 Overview

In the initial screening process, we identified 464 articles (84 duplicates). After removing the duplicates, 328 articles were excluded based on the inclusion and exclusion criteria listed above by reading the titles and abstracts. On the next stage, the remaining 50 full-text articles were assessed for eligibility and 28 articles were excluded. A final sample of 22 articles was included in this systematic review, and through bibliography reviews and Google Scholar, 8 additional studies were added. In the end, a total of 30 studies were included for synthesis. Figure 1 describes the screening and inclusion process taken following PRISMA guidelines.

Of these 30 articles, a majority were descriptive studies (n=18) including 12 observational studies (Baldofski et al., 2023, Côté & Mishara, 2022; Cox et al., 2021; Fukkink & Hermanns, 2009a; Gilat & Shahar, 2007; Lake et al., 2022; Pisani et al., 2022; Schwab-Reese et al., 2022; Szlyk et al., 2020; Thompson et al., 2019; Van Wyk & Gibson, 2022; Zalsman et al., 2021), 2 cross-sectional studies (Efe et al., 2023; Eckert et al., 2022), 3 survey studies (Gould et al., 2021; 2022; O'Riordan et al., 2022) and 1 interview study (Predmore et al., 2017). Followed by 9 implementation or evaluation of a helpline studies (Amorim et al., 2021; Arenas-Landgrave et al., 2022; Evans et al., 2013; Finn & Hughes, 2008; Mokkenstorm et al., 2017; Moylan et al., 2022; Munro-Kramer et al., 2023; Wong & Zhou, 2022, Yip et al., 2021) and 3 intervention non-RCT studies (Fukkink & Hermanns, 2009b; Mickelson et al., 2023; Runkle et al., 2021). The aims of the studies differed, focusing on characterizing the texters or chatters and helpline responders demographically and clinically, describing and analysing the implementation of a text or chat helpline or pilot program, assessing the effectiveness of the text or chat

helpline, or comparing between telephone and text crisis interventions. Table 2 quantifies different characteristics the thirty studies that were included in this review.

Table 2

Characteristics of the studies included in this review: study design, helpline name, helpline modality, and targeted population

Study characteristic	N	%
Study design		
Descriptive	18	60
Observational studies	12	
Cross-sectional studies	2	
Survey studies	3	
Interview study	1	
Implementation	9	30
Intervention (Non-RCT)	3	10
Helpline name (N = 18)		
Crisis Text Line	5	16.6
Lifeline US	2	6.67
Lifeline AU	1	3.33
Krisenchat	3	10
Kindertelefoon	2	6.67
Canadian Suicide Prevention Service (CSPS)	1	3.33
113Online	1	3.33
Rainn	1	3.33
Youthline	1	3.33
Veteran Crisis Line	1	3.33
ERAN	1	3.33
SAHAR	1	3.33
Salud Mental COVID-19	1	3.33
Calma Nessa Hora	1	3.33
TextToday	1	3.33
Texting platform (WeChat)	1	3.33
Open Up	1	3.33
Not disclosed	5	16.67
Helpline modality, if applicable (N = 30)		
Text only	13	43.33
Chat only	11	36.67
Text and chat	6	20
Population (N = 30)		
All ages	16	53.33
Adults	8	26.67
Adolescents, Young Adults	3	10
Children	3	10

In addition, some studies served specific age groups, such as only adults (Amorim-Ribeiro et al., 2021; Arenas-Landgrave et al., 2022; Cox et al., 2021; Mickelson et al., 2023; Moylan et al., 2022; Munro-Kramer et al., 2023; Predmore et al., 2017; Wong & Zhou, 2022), adolescents and young adults (Finn & Hughes, 2008; Van Wyk & Gibson, 2022; Yip et al., 2021), children (Fukkink & Hermanns, 2009a; 2009b; Schwab-Reese et al., 2022), while the majority, 16 out of 30 studies was for all ages groups (Baldofski et al., 2023; Côté & Mishara, 2022; Efe et al., 2023; Eckert et al., 2022; Evans et al., 2013; Gilat & Shahar, 2007; Gould et al., 2021; 2022; Lake et al., 2022; Mokkenstorm et al., 2017; O'Riordan et al., 2022; Pisani et al., 2022; Runkle et al., 2021; Szlyk et al., 2020; Thompson et al., 2019; Zalsman et al., 2021).

Different crisis contexts were represented in the articles, with thirteen studies focused on suicide (Cox et al., 2021; Côté & Mishara, 2022; Gilat & Shahar, 2007; Gould et al., 2021; Lake et al., 2022; Mickelson et al., 2023; Mokkenstorm et al., 2017; Pisani et al., 2022; Predmore et al., 2017; Szlyk et al., 2020; Van-Wyk & Gibson, 2022; Yip et al., 2021; Zalsman et al., 2021), ten studies focused on multiple mental health concerns (Baldofski et al., 2023; Eckert et al., 2022; Efe et al., 2023; Evans et al., 2013; Fukkink & Hermanns, 2009a; 2009b; Gould et al., 2022; O'Riordan et al., 2022; Runkle et al., 2021; Thompson et al., 2019), three studies focused on sexual assault (Finn & Hughes, 2008; Moylan et al., 2022; Munro-Kramer et al., 2023), three studies focused on COVID-19 (Amorim-Ribeiro et al., 2021; Arenas Landgrave et al., 2022; Wong & Zhou, 2022), and one study which focused on child maltreatment (Schwab-Reese et al., 2022).

Thirteen studies communicated through text messaging (i.e., synchronous SMS) (Baldofski et al., 2023; Côté & Mishara, 2022; Eckert et al., 2022; Efe et al., 2023; Evans et al., 2013; Gould et al., 2022; 2023; Pisani et al., 2022; Thompson et al., 2019; Runkle et al., 2021; Schwab-Reese et al., 2022; Szlyk et al., 2020; Yip et al., 2021), eleven studies through online chat (i.e., messaging in real time over the internet) (Amorim-Ribeiro et al., 2021; Arenas-Landgrave et al., 2022; Cox et al., 2021; Finn & Hughes, 2008; Gilat & Shahar, 2007; Mickelson et al., 2023; Moylan et al., 2022; Mokkenstorm et al., 2017; Munro-Kramer et al., 2023; Wong & Zhou, 2022; Zalsman et al., 2021) and six studies through both text and online chat (Fukkink & Hermanns, 2009a; 2009b; Lake et al., 2022; O'Riordan et al., 2022; Predmore et al., 2017; Van-Wyk & Gibson, 2022). When it comes to the specific communication platforms, a variety of communication methods was used including SMS helplines, helplines web-based platforms or other instant messaging apps (WhatsApp, WeChat). Among the helplines in this study, twenty-four helplines

functioned 24-hour a day every day of the week (Baldofski et al., 2023; Côté & Mishara, 2022; Cox et al., 2021; Eckert et al., 2022; Efe et al., 2023; Finn & Hughes, 2008; Gilat & Shahar, 2007; Gould et al. 2021; 2022; Lake et al., 2022; Mokkenstorm et al., 2017; Moylan et al., 2022; Munro-Kramer et al., 2023; O'Riordan et al., 2022; Pisani et al., 2022; Predmore et al., 2017; Runkle et al., 2021; Szlyk et al., 2020; Thompson et al., 2019; Van Wyk & Gibson, 2022;Yip et al., 2021; Zalsman et al., 2021), two helplines were available during specific hours from 11AM to 9PM (Fukkink & Hermanns, 2009a; 2009b), and four helplines did not disclose their operational hours (Amorim-Ribeiro et al., 2021; Arenas-Landgrave et al., 2022; Evans et al., 2013; Mickelson et al., 2023; Schwab-Reese et al., 2022; Wong & Zhou, 2022). The text and chat helpline responders included counselors or trained volunteers, in ten studies the responders had a background in psychology or similar (Amorim-Ribeiro et al., 2021; Arenas-Landgrave et al., 2022; Baldofski et al., 2023; Côté & Mishara, 2022; Eckert et al., 2022; Efe et al., 2023; Mickelson et al., 2023; Munro-Kramer et al., 2023; Predmore et al., 2017; Wong & Zhou, 2022), and in the remaining twenty they were volunteers who underwent crisis intervention training (Cox et al., 2021; Evans et al., 2013; Finn & Hughes, 2008; Fukkink & Hermanns, 2009a; 2009b; Gilat & Shahar, 2007; Gould et al., 2021; 2022; Lake et al., 2022; Mokkenstorm et al., 2017; Moylan et al., 2022; O'Riordan et al., 2022; Pisani et al., 2022; Runkle et al., 2021; Schwab-Reese et al., 2022; Szlyk et al., 2020; Thompson et al., 2019; Van-Wyk & Gibson, 2022; Yip et al., 2021; Zalsman et al., 2021). The lack of training in crisis intervention was a criterion for exclusion on this review, so in no studies in this review were the volunteers or counselors not provided with specific training.

Studies originated in five different continents: Asia (two studies from China and two from Israel), Europe (three studies from Germany and three from the Netherlands), South America (one study from Brazil), North America (ten studies from the United States, four from Canada and one from Mexico) and Oceania (one study from Australia and one from New Zealand). This broad geographical distribution provides a rich and diversity of perspectives covered in this field of research. Table 3 further characterizes the studies included in this review on their crisis context, aim, helpline, population and location.

Table 3

Characteristics of the studies included in this review: crisis context, aim of the study, helpline details, targeted population and location

Study citation	Crisis context	Aim of the study	Helpline details	Study population	Location
Wong & Zhou (2022)	COVID-19	Outlining a structured chat-based intervention protocol for crisis support (including psychological) during the COVID-19 pandemic, and evaluating its implementation from the perspective of the helpline volunteers.	Online chat on WeChat available by psychologists with undisclosed functioning times.	Adults	China
Yip et al.(2021)	Suicide	Providing information on usage pattern, effectiveness of the counselling service, the approach for repeated users and use of big data and AI to enhance service.	24/7 text line (SMS) and online chat 'OpenUP' (WhatsApp, Facebook Messenger, and web portal) available by trained volunteers with clinical supervisors.	Adolescents, Adults	China
Munro-Kramer et al. (2023)	Sexual Assault	Analyzing chat-based intervention processes, focusing on its quality and effectiveness.	24/7 online chat available by psychologists.	Adults	United States
Cox et al. (2021)	Suicide	Analyzing crisis counselor helping styles and their effect on client outcomes.	24/7 online chat on sexual assault from a university service (name undisclosed) available by trained volunteers and paid staff.	Adults	Canada
Mickelson et al. (2023)	Suicide	Creating and validating a chat-based crisis intervention model focused on distress processing.	Online chat available by psychologists with undisclosed functioning times.	Adults	Canada
Finn & Hughes (2008)	Sexual Assault	Measuring the satisfaction, techniques used, reasons for texting the line and counselors' of an online crisis counselling service for victims of rape and sexual assault.	24/7 online chat 'Rainn National Sexual Assault Online Hotline' available by trained volunteers with online supervisors who are professional rape counsellors.	Adolescents, young Adults	United States
Runkle et al. (2021)	Natural disaster	Retrospective text-based analysis of changes in crisis text volume by youth following a hurricane for different reasons (including stress and anxiety, depression, and suicidal thoughts).	24/7 text line 'Crisis Text Line (CTL)' available by trained volunteers with a supervisor.	Children, adolescents and adults	United States
Côté & Mishara (2022)	Suicide	Characterizations of callers, their problems and techniques that predict a positive effect of text-based crisis support.	24/7 text line 'Canadian Suicide Prevention Service (CSPS)' available by psychologists.	Children, adolescents and adults	Canada
Van-Wyk & Gibson (2022)	Suicide	Describing young people's experiences of suicidality in the moment of reaching out for help and reflecting if the services are well set up to respond to this (in-person and telephone vs. chat).	24/7 text line and online chat 'Youthline' available by trained volunteers.	Adolescents, young adults	New Zealand
O'Riordan et al. (2022)	Multi-type	Identifying expectations and outcomes of chat-based intervention users and differences between suicide and non-suicide contacts for help.	24/7 text line and online chat 'Lifeline Australia' available by trained volunteers and paid crisis counsellors.	Children, adolescents and adults	Australia
Gould et al. (2022)	Multi-type	Assessing the perceived effectiveness of crisis text line interventions, including texter's engagement with their crisis counselors.	24/7 text line 'Crisis Text Line (CTL)' available by trained volunteers with a supervisor.	Children, adolescents and adults	Canada
Eckert et al. (2022)	Multi-type	Measuring acceptability, feasibility and texter satisfaction of text-based crisis counselling service for young populations (children, adolescents, young adults).	24/7 text line 'Krisenchat' available by volunteers with a background in psychology, psychotherapy, education, or social work.	Children, adolescents and young adults	Germany
Predmore et al. (2017)	Suicide	Comparing telephone and chat/text-based crisis services on suicidality in a veteran population.	24/7 text line and online chat 'Veteran Crisis Line ' available by paid staff of the Veterans Affairs with a bachelor's degree in social work, psychology, mental health counseling, or a related field.	Adults	United States
Szlyk et al. (2020)	Suicide	Using a large dataset of text messages to analyze machine learning algorithm to predict suicide risk.	24/7 text line 'Crisis Text Line (CTL)' available by trained volunteers with a supervisor.	Children, adolescents and adults	United States
Gould et al. (2021)	Suicide	Measuring the effectiveness of a national chat service through analyzing chat large datasets from a widely used helpline.	24/7 online chat 'Lifeline Crisis Chat Network (LCC)' available by trained volunteers.	Children, adolescents, adults	United States
Schwab-Reese et al. (2022)	Child maltreatment	Qualitative analysis of text-based service on child maltreatment disclosure by the victims of the past and future sources of support.	Text line available by trained volunteers with undisclosed named and functioning times.	Children	United States
Zalsman et al. (2021)	Suicide	Comparing non-suicide related chats and suicide-related chats in the first half 2019 and first half 2020 (pre-COVID-19 vs post-COVID-19).	24/7 online chat 'Sahar' available by trained volunteers supervised by mental health professionals.	Children, adolescents, adults	Israel
Moylan et al. (2022)	Sexual assault	Comparing patterns of use and records between text and call on sexual assault university hotline.	24/7 online chat of Web-based crisis hotline for sexual assault survivors at a large Midwestern university in the United States available by trained volunteers.	Adults	United States
Lake et al. (2022)	Suicide	Quantitative analysis to describe chatters suicide risk status and counselor behaviors.	24/7 text line and online chat 'Lifeline Crisis Chat Network (LCC)' available by trained volunteers.	Children, adolescents and adults	United States
Gilat & Shahar (2007)	Suicide	Comparison of suicidal calls between telephone, personal chat and asynchronous online support group.	24/7 online chat' Israeli Association for Emotional First Aid (ERAN)' in different languages (english, hebrew, arabic, russian, etc.) by trained volunteers.	Children, adolescents and adults	Israel
Efe et al. (2023)	Multi-type	Characterization of frequent chatters from an online crisis counselling service for young populations (children, adolescents, young adults).	24/7 text line 'Krisenchat' available by volunteers with a background in psychology, psychotherapy, education, or social work.	Children, adolescents and young adults	Germany
Mokkenstorm et al. (2017)	Suicide	Comparing chat-based and telephone-based crisis intervention in the same crisis hotline.	24/7 online chat '113Online' available by trained volunteers.	Children, adolescents and adults	Netherlands
Thompson et al. (2019)	Multi-type	Analysis of help-seeking behavior in youth on a chat-service after release of a TV show that contains suicide triggers.	24/7 text line 'Crisis Text Line (CTL)' available by trained volunteers with a supervisor.	Children, adolescents and adults	United States
Amorim-Ribeiro et al. (2021)	COVID-19	Outlining a structured chat-based intervention protocol for psychological crisis support during the COVID-19 pandemic, and evaluating its implementation.	Online chat 'Calma Nessa Hora' available by trained volunteers with weekly supervision from experienced psychologists with undisclosed functioning times.	Adults	Brazil
Baldofski et al. (2023)	Multi-type	Investigating the impact of using a text-based counseling service on the further help-seeking behavior of young people, and identifying associated factors of further help-seeking.	24/7 text line 'Krisenchat' available by volunteers with a background in psychology, psychotherapy, education, or social work.	Children, adolescents and young adults	Germany
Arenas-Landgrave. et al (2922)	COVID-19	Outlining a structured chat-based intervention protocol for psychological crisis support during the COVID-19 pandemic, and evaluating its implementation.	Online chat 'Salud Mental COVID-19' available by psychologists/ psychotherapists with undisclosed functioning times.	Adults	Mexico
Pisani et al. (2022)	Suicide	Characterizing texter's of a large crisis text line, in terms of the key characteristics and opportunities for suicide prevention.	24/7 text line 'Crisis Text Line (CTL)' available by trained volunteers with a supervisor.	Children, adolescents and adults	United States
Evans et al. (2013)	Multi-type	Evaluating a pilot text messaging program with youth, including focus groups with young students and counselors from the crisis line.	Text line 'TextToday' available by trained volunteers with undisclosed functioning times.	Children, adolescents and young adults	United States
Fukkink & Hermanns (2009a)	Multi-type	Quantitative content analysis between telephone-based and text-based support of a Dutch child helpline.	11AM to 9PM text and online chat 'Kindertelefoon' available by trained volunteers.	Children	Netherlands
Fukkink & Hermanns (2009b)	Multi-type	Comparing telephone-based and text-based crisis intervention in the same crisis hotline from a well-being and changes in reported burden perspectives both during the crisis and on follow-up.	11AM to 9PM text and online chat 'Kindertelefoon' available by trained volunteers.	Children	Netherlands

3.2 Characterising texters

Fostering a deeper understanding of who are the individuals using text-based crisis support services through their demographic (gender, age, ethnicity, and sexuality), clinical characteristics (crisis context and psychological/ psychiatric symptoms), can help us examine broader factors that may be influencing these help-seeking behaviors.

3.2.1 Demographic characteristics

Gender

Among the thirteen studies that reported on gender, texters seem to be predominantly female, being approximately two thirds ranging from 51% to 83.4% (Arenas-Landgrave et al., 2022; Baldofski et al., 2023; Côté & Mishara, 2022; Cox et al., 2021; Eckert et al., 2022; Efe et al., 2023; Evans et al., 2013; Fukkink & Hermanns, 2009a; Gilat & Shahar, 2007; Gould et al., 2021; Mickelson et al., 2023; Mokkenstorm et al., 2017; Pisani et al., 2022; Zalsman et al., 2021). In contrast, males are around 1/3 of the texters ranging from 4.5% to 29% (Baldofski et al., 2023; Côté & Mishara, 2022; Cox et al., 2021; Eckert et al., 2022; Mokkenstorm et al., 2017; Zalsman et al., 2021), with the exception of one study that reported 44% male texters (Mickelson et al., 2023). Although less studies have reported on it, gender minorities are also represented as texters, ranging from around 2% to 13.2% across different studies (Baldofski et al., 2023; Côté & Mishara, 2022; Cox et al. 2021; Eckert et al., 2022; Gould et al., 2021; Mickelson et al., 2023; Pisani et al., 2022). Interestingly, the proportion of texters in one study that identified as belonging to a gender minority (7.9%) was far greater than for the general population (Pisani et al., 2022). When comparing amongst genders, gender differences are generally not significant across the studies in the types of issues discussed (Côté & Mishara, 2022), frequency of text (Eckert et al., 2022) or when it comes to the frequency of non-suicide related conversations from 2019 to 2020 during the COVID-19 pandemic (Zalsman et al., 2021). For suicide-related conversations on the other hand, they seemed to increase from 62% to 73% for females while it reduced for males from 20% to 14% during the COVID-19 pandemic (Zalsman et al., 2021).

Age

For the twenty-one studies that have reported on age, texters are largely youth between their teens and early to mid-twenties, with a significant variation across the different studies (Arenas-Landgrave et al., 2022; Baldofski et al., 2023; Cotê & Mishara, 2022; Cox et al., 2021; Eckert et al., 2022; Evans et al., 2013; Fukkink & Hermanns,

2009a; 2009b; Gould et al., 2021; 2022; Lake et al., 2022; Mickelson et al., 2023; Mokkenstorm et al., 2017; O'Riordan et al., 2022; Pisani et al., 2022; Runkle et al., 2021; Schwab-Reese et al., 2022; Thompson et al., 2019; Van-Wyk & Gibson, 2022; Finn & Hughes et al., 2008; Zalsman et al., 2021).

Texters seem to be predominantly under 25 years-old, around 70% to 93% (Arenas-Landgrave et al., 2022; Gould et al., 2021; Pisani et al., 2022; Van-Wyk & Gibson, 2022; Finn & Hughes, 2008; Runkle et al., 2021; Thompson et al., 2019) or with a mean age between 24 to 28 years (Côté & Mishara, 2022; Lake et al., 2022). Some studies also report significant proportions of minors, noting 40% of texters being minors (Gould et al., 2021), texters aged between 15 and 17 years old (Evans et al., 2013) or even helplines that are exclusive for younger children (Fukkink & Hermanns, 2009a; 2009b; Schwab-Reese et al., 2022). Nevertheless, there's still a broad age distribution of texters with adults being a well-represented group too (Arenas-Landgrave et al., 2022; Côté & Mishara, 2022; Mickelson et al., 2023; Mokkenstorm et al., 2017). In Mokkenstorm and colleagues (2016) for example texters aged 18 to 34 years make 53.6% and 35 to 54 years 17.7%. Additionally, most of the crisis text lines included in this review cater to all age groups, including children, adolescents and adults (16 crisis text lines) or to only adults (8 crisis text lines). While less prevalent, older adults are also reported to use text crisis services with reports of 1.7% aged over 55 years (Mokkenstorm et al. 2016) and the upper limit ranging from 54 and 69 years (Arenas-Landgrave et al., 2022; Côté & Mishara, 2022; Mickelson et al., 2023; Mokkenstorm et al., 2017). Interestingly, one study specifically noted an increase in usage during the COVID-19 pandemic among adults aged over 50 (Zalsman et al., 2021). Although diverse as described, the texter user base remains predominantly adolescent or young in most studies. When comparing texters by age, younger texters seem to contact helplines more frequently and to find the conversation more helpful than older texters (Gould et al., 2022; Pisani et al., 2022) but also reveal suicidal ideation at higher rates (Lake et al., 2022). Conversely, one study found no significant demographic differences for both suicide and non-suicide related conversations according to age (O'Riordan et al., 2022).

Ethnicity

Text support services seem to be used across different ethnic and racial demographics (Gould et al., 2022; Pisani et al., 2022; Runkle et al., 2021), in some cases with nearly half the texters belonging to ethnicities other than non-Hispanic White (Pisani et al., 2022). For the three studies that reported on ethnicity, they identified that among

the texters 14%/13.9% identify as Latinx/ Hispanic (Pisani et al., 2022; Runkle et al., 2021, respectively), 8.2% as Black (Pisani et al., 2022), 6% as Native American (Runkle et al., 2021) and 3.5% as Asian (Pisani et al., 2022). For some of these texters the text service was considered the only source for help, especially for ethnic minority groups (Pisani et al., 2022). Gould and colleagues (2022) reported race differences among texters with black texters feeling more overwhelmed, depressed and suicidal than white texters by the end of the helpline responder intervention. The opposite pattern is observed for Latinx/ Hispanic texters, providing more favorable feedback to the helpline responders.

Sexuality

Only Pisani and colleagues (2022) reported on the sexuality of texters, finding that nearly half the texters in their sample were highly diverse on their sexual identity and identified as other than heterosexual/ straight.

3.2.2 Clinical characteristics

Around 43% of the helplines were focused on suicide (13 studies), 33% on multiple mental health concerns (10 studies), 10% on sexual assault (3 studies), 10% on COVID-19 mental health derived issues (3 studies) and 3% on child maltreatment (1 study). To provide a framework to organize the clinical characteristics and symptoms, we will be allocating and describing studies based on their crisis context.

Suicide

Thirteen studies were conducted on suicide prevention helplines or texter samples (Cox et al., 2021; Côté & Mishara, 2022; Gilat & Shahar, 2007; Gould et al., 2021; Lake et al., 2022; Mickelson et al., 2023; Mokkenstorm et al., 2017; Pisani et al., 2022; Predmore et al., 2017; Szlyk et al., 2020; Van-Wyk & Gibson, 2022; Yip et al., 2021; Zalsman et al., 2021).

Only nine of these studies reported on clinical symptoms and reasons behind reaching out for text-based support (Côté & Mishara, 2022; Gould et al., 2021; Lake et al., 2022; Mokkenstorm et al., 2017; Pisani et al., 2022; Szlyk et al., 2020; Van-Wyk & Gibson, 2022; Yip et al., 2021; Zalsman et al., 2021), all of them emphasizing a high prevalence of suicidal thoughts. Comparing lifetime and current suicidal ideation, a recurrent history of suicidal ideation seems to be more prevalent than current ideation among chatters (Lake et al., 2022).

The severity of suicide risk was assessed in most studies by categories, most of the texters/chatters presented a low risk of suicide describing suicidal thoughts without a

plan or intent – 66% (Cotê & Mishara, 2022), 61.1% (Mokkenstorm et al., 2017), 13% (Pisani et al., 2022) and 81.6% (Yip et al., 2021). After, the most prevalent was medium suicide risk describing suicidal ideation with a plan – 25.2% (Cotê & Mishara, 2022), 21.2% (Mokkenstorm et al., 2017), 14.8% (Yip et al., 2021) and 3% (Pisani et al., 2022). High risk of suicide with a plan and means to achieve it, showcasing an imminent danger of attempting suicide, was overall less prevalent in most studies – 1.5% (Yip et al., 2021), 3.8% (Mokkenstorm et al., 2017), 6% (Pisani et al., 2022), 8.9% (Cotê & Mishara, 2022), and 12% (Lake et al., 2022). Suicidal ideation severity seems to vary depending on age, younger children aged 13 and younger present more severe ideation than other age groups, individuals aged 14 to 64 years present similar severity of risk, and the risk seems to be lower for those over 65 (Pisani et al., 2022). For many young individuals the motive of the suicide isn't just death but as a coping strategy to escape from problems or pain, which in most cases presents itself as ambivalence towards the act of suicide (Van-Wyk & Gibson, 2022). No differences were reported for suicide risk depending on ethnicity and gender, except for gender minorities that present a greater risk (Pisani et al., 2022).

The most commonly discussed topics in the texts/ chats were psychiatric and emotional symptoms, like depression or anxiety (Mokkenstorm et al., 2017; Pisani et al., 2022; Szlyk et al., 2020; Yip et al., 2021, Zalsman et al., 2021), along with relational and interpersonal problems (Mokkenstorm et al., 2017; Szlyk et al., 2020; Yip et al., 2021). The COVID-19 pandemic seems to have caused a decrease in chat conversations related to depression, while issues of loneliness seemed to maintain comparable proportions, possibly reflecting changes in coping mechanisms and outreach (Zalsman et al., 2021).

The remaining four studies only referred generally that their main topic was suicidality, without further describing the clinical symptoms observed (Cox et al., 2021; Gilat & Shahar, 2007; Mickelson et al., 2023; Predmore et al., 2017).

Multiple mental health concerns

Ten studies were conducted on helplines that intervened with a multitude of mental health concerns (Baldofski et al., 2023; Eckert et al., 2022; Efe et al., 2023; Evans et al., 2013; Fukkink & Hermanns, 2009a; 2009b; Gould et al., 2022; O'Riordan et al., 2022; Runkle et al., 2021; Thompson et al., 2019).

A diverse set of mental health concerns is addressed by helpline texters/ chatters across these studies. Across multiple helplines for all ages, psychiatric symptoms (i.e., anxiety, depression, suicidality, eating problems, substance problems, among others) were most frequently reported (Baldofski et al., 2023; Eckert et al., 2022; Evans et al.,

2013; Gould et al., 2022; O'Riordan et al., 2022), ranging from proportions of 27.9% (Evans et al., 2013), 60.1% (Eckert et al., 2022) to 74.5% (Baldofski et al., 2023). Psychiatric symptoms are followed in frequency by psychosocial distress in interpersonal relationships and psychological distress (loneliness, guilt, low self-esteem, and others) (Baldofski et al., 2023; Eckert et al., 2022; Efe et al., 2023; Evans et al., 2013; Gould et al., 2022). This trend verifies across frequent chatters, with psychiatric symptoms being most prevalent in what concerns suicidality, non-suicidal self-injury, depression, and anxiety, respectively (Efe et al., 2023). Moreover, psychiatric symptoms seem to be more frequently mentioned by females, while LGBTQIA+ related concerns seem to be voiced by those who identify as diverse (Eckert et al., 2022). Some helplines reported a higher number of reasons of contact related to suicidality (59.5%) when compared to non-suicide contacts (O'Riordan et al., 2022).

Children seem to be most frequently discussing emotional problems (such as loneliness, self-harm and depression), bullying, courtship or their relationship with their parents (Fukkink & Hermanns, 2009a; 2009b). Online chats tended to be more focused on providing support and less towards providing information than on phone calls (Fukkink & Hermanns, 2009b).

Exposure to stressful or triggering events has also been shown to affect the number of texts to a helpline, be it derived from a TV show with heavy triggers on suicide like '13 Reasons Why' (Thompson et al., 2019) or a natural disaster like a hurricane (Runkle et al., 2021). While a significant and sustained increase of conversation volume on topics anxiety/ stress and suicidal thoughts was observed immediately after a hurricane (Runkle et al., 2021), a decrease in support-seeking for suicidal thoughts was verified after the release of the show '13 Reasons Why' (Thompson et al., 2019).

Sexual assault

Three studies were carried out in sexual assault chat helplines (Finn & Hughes, 2008; Moylan et al., 2022; Munro-Kramer et al., 2023). Sexual assault was the most frequently addressed topic for support – 52% (Finn & Hughes, 2008), 59.5% (Moylan et al., 2022) and 44.9% (Munro-Kramer et al., 2023). Most of the chatters expressed distress, anger, sadness or discussions of suicide (Finn & Hughes, 2008; Munro-Kramer et al., 2023). Other topics approached included child abuse, incest and incidences of domestic violence (Finn & Hughes, 2008; Moylan et al., 2022; Munro-Kramer et al., 2023). A majority of the chats were initiated by the survivor, and in a lesser proportion by a friend, family member, professional or others (Moylan et al., 2022; Munro-Kramer et al., 2023).

COVID-19

Three studies were focused on the implementation of helplines to aid in mental health concerns during the COVID-19 pandemic (Amorim-Ribeiro et al., 2021; Arenas Landgrave et al., 2022; Wong & Zhou, 2022). The COVID-19 pandemic had an impact on mental health of the overall population living under extreme stress (Wong & Zhou, 2022). The most common clinical symptoms mentioned among these COVID-19 helplines were anxiety, depressive symptoms/ risk of suicide and stress (Amorim-Ribeiro et al., 2021; Arena-Landgrave et al., 2021). On the *Calma Nessa Hora* chat helpline, social issues, grief, interpersonal conflicts, substance abuse, risk of domestic violence and other atypical cases (homicidal and persecutory thoughts, reports of sexual abuse) were also mentioned by chatters (Amorim-Ribeiro et al., 2021). In contrast, the *Salud Mental* chat helpline had only 30% of its chatters report psychological distress, with the rest of the users exploring the online mental health modules provided and not needing any intervention.

Child maltreatment

One study focused on a child maltreatment helpline (Schwab-Reese et al., 2022). The types of abuse reported in this text helpline were more than half describing suffering psychological abuse, three-quarters reporting physical abuse and fewer reporting sexual abuse or neglect. The duration of the maltreatment seems to be on-going for several years and to happen multiple times for most texters (Schwab-Reese et al., 2022).

Receiving help through other channels

Some of the texters/ chatters reported receiving help through other channels, including professional help services like doctors or therapists (20.7% of all users, 42.4% of frequent chatter users; 23%) (Eckert et al., 2022; Efe et al., 2023; Pisani et al., 2022, respectively). Pisani and colleagues (2022) reported that about a quarter of the texters (23%) received help from other sources when in a crisis and more than a quarter mentioned their only source in the crisis was the helpline. In this same study, differences in receiving help from external sources were found on gender, age and ethnicity. Differences were found in gender on reporting getting external help, as other gender minority individuals (28.6%) and females (23.2%) seem to be receiving more external help than males (18.7%). As age increases, the reports of receiving help from other sources decreases, from 31.2% in the youngest to 20.9% in the oldest. Regarding ethnicity, a majority of the texters reporting receiving help are White (23%), with a lower percentage amongst Hispanic (15.8%), Black (16.3%) and Native Hawaiian or Other

Pacific Islander (14.4%) (Pisani et al., 2022). After the text conversation, a study found that the youth tended to be less interested in outside help or reported less serious issues that didn't require further assistance (Evans et al., 2013).

3.3 Psychological outcomes from the text-based crisis intervention

3.3.1 User satisfaction and usefulness perception

User satisfaction of the text-based crisis intervention helplines was evaluated across four studies recurring to post-intervention surveys with its users (Arenas-Landgrave et al., 2022; Eckert et al., 2022; Efe et al., 2023; Finn & Hughes, 2008; Munro-Kramer et al., 2023). The majority of these helpline users felt very satisfied with the service – 85.7% (Arenas-Landgrave et al., 2022), 72% (Finn & Hughes, 2008), 64.7% (Eckert et al., 2022) and other high percentages (Efe et al., 2023; Munro-Kramer et al., 2023). No differences were found in satisfaction between frequent chatters and the general user population, both recommending the service at similar rates (Efe et al., 2023). One study stated that ease of use and users' perceptions of helpline responders' knowledge and skills was strongly associated with satisfaction, indicating these factors may have an impact on user satisfaction (Finn & Hughes, 2008).

Studies evaluating five different programs that implemented a text-based helpline reported its users found the services helpful (Amorim-Ribeiro et al., 2021; Arenas-Landgrave et al., 2022; Evans et al., 2013; Finn & Hughes, 2008; Yip et al., 2021). For one of the helplines, a sharp increase in help-seeking behaviours of adolescents and young adults through text was detected (Evans et al., 2013). A well-known helpline reported that two-thirds of chatters found their service to be helpful too (Gould et al., 2021).

3.3.2 Clinical outcomes

Only five out of the thirty studies directly reported on the impact of text-based psychological crisis interventions on clinical symptoms, like reducing individuals' crisis states, psychological distress and risk of suicide (Côté & Mishara, 2022; Gould et al., 2021; 2022; Mokkenstorm et al., 2017; Yip et al., 2021). Two studies described the relationship between clinical outcomes and other factors, such as number of words exchanged during conversation or techniques the helpline responders applied (O'Riordan et al., 2022; Van-Wyk & Gibson, 2022). To note, effectiveness and clinical outcomes were measured differently across studies, using different variables (e.g., reduction of

clinical symptoms, risk of suicide) or measuring the same variable but using different scales or questionnaires.

Evidence shows that crisis intervention through text/ chat yields positive effects and is largely similar for all users, even following a normal distribution (Côté & Mishara, 2022; Gould et al., 2021; 2022; Mokkenstorm et al., 2017). Concerning emotional state, data indicates a reduction in emotional distress is observed by the end of the text/ chat conversations (Gould et al., 2021; 2022; Mokkenstorm et al., 2017). Some exceptions to this included feeling tired/ dynamic, crying, and suicidal ambivalence (Mokkenstorm et al., 2017). Findings also show that a majority of both chatters and texters felt the intervention was helpful, feeling less overwhelmed, depressed and more hopeful (Gould et al., 2021; 2022). Among texters/chatters that were feeling very distressed by the beginning of the conversation, over two-thirds felt significantly less upset by the end (Gould et al., 2021). When directly comparing chatter and texters clinical outcomes, texters seem to present slightly higher proportions of improvements in hopefulness, reduction in depression and feeling overwhelmed, compared to chatters (Gould et al., 2021; 2022). Contrastingly, some evidence shows a varied impact on emotional well-being (33.1% did not feel better and 20.2% felt somewhat to a lot better after the conversation). However, 2/3 of the texters felt grateful towards the helpline responder and close to half mentioned learning new or more effective coping strategies (Mokkenstorm et al., 2017).

Particularly in relation to suicidality, findings show that text-based intervention tends to lower feeling suicidal by the end of the conversation by 46.1% to 85.3% (Gould et al., 2022; Mokkenstorm et al., 2017; Yip et al., 2021). Comparing chat and text interventions, the reduction in suicidality is similar between the two but texters seem to experience a marginally higher rate of improvement. A small minority of texters and chatters reported persisting or worsened emotional states, feeling less hopeful, more depressed, overwhelmed and suicidal (Gould et al., 2021; 2022)

A positive correlation was detected between the number of words exchanged during the chat interventions with positive outcomes by exploring more resources and solutions and developing an action plan (Côté & Mishara, 2022; O'Riordan et al., 2022). This suggests the quality of the intervention may be more related to the amount of texts exchanged and not its length. The relationship between the texter/ chatter and the helpline responder appears to be strongly associated with the perceived effectiveness of the conversation, including the perception of genuine concern and the reinforcement of

strengths and positive actions by the helpline responder (Gould et al., 2021; 2022; Van-Wyk & Gibson, 2022).

There were three studies that measured effectiveness and clinical outcomes from the intervention by comparing between call and text/ chat conversation (Fukkink & Hermanns (2009a; 2009b; Predmore et al., 2017). Their results can be further described in the section below.

3.4 Call and text crisis support comparison

Psychological crisis intervention can be delivered face to face, through phone calls or through text (da Silva et al., 2015; Hobfoll et al., 2007; Roberts & Ottens, 2005; Sindahl, Fukkink & Helles, 2020). Eight studies compared text-based crisis intervention with other modalities, specifically comparing phone calls, text, online chat and asynchronous support groups (Fukkink & Hermanns, 2009a; 2009b; Gilat & Shahar, 2007; Lake et al., 2022; Mokkenstorm et al., 2017; Moylan et al., 2022; Predmore et al., 2017; O'Riordan et al., 2022). Of those six, four studies compared text/chat to phone call (Lake et al., 2022; Mokkenstorm et al., 2017; Moylan et al., 2022; Predmore et al., 2017), one study compared phone call, online chat and text message (O'Riordan et al., 2022), one study compared asynchronous support group, phone call and online chat (Gilat & Shahar, 2007).

In general, studies comparing phone call and text or chats yield similar results on their effectiveness on reducing individuals' distress (Predmore et al., 2017; Fukkink & Hermanns, 2009a; 2009b), with some studies even reporting benefits exclusive to text-based crisis interventions (Fukkink & Hermanns, 2009b; Gilat & Shahar, 2007; Lake et al., 2022; Mokkenstorm et al., 2017; Predmore et al., 2017).

Suicidal crisis or history of trauma are more often disclosed in chats (84% – 86.1%) than on calls (23% – 35.2%), showing they tend to seek immediate support on online platforms during mental health crisis (Gilat & Shahar, 2007; Lake et al., 2022; Mokkenstorm et al., 2017; Predmore et al., 2017). Chat interventions also appear to last longer than phone calls, requiring helpline responders to engage deeper in rapport-building and problem-solving in most sessions (Fukkink & Hermanns, 2009a; Lake et al., 2022; Moylan et al., 2022; Predmore et al., 2017). The young population seems to be more attracted towards seeking support for suicidality through this channel, possibly due to its anonymity (Gilat & Shahar, 2007). Suicidal ambivalence was also observed to be moving towards "want to live" and less towards "want to die" in chats compared to phone

calls. Therefore, showing improvements to the emotional state in desperateness, depressive mood, sadness, hopelessness and apprehensiveness but sometimes deteriorating helplessness and confusedness (Mokkenstorm et al., 2017). From the helpline responders' perspective, assessing suicide risk and emotional state seems to be more difficult in chat than phone call, as voice conveys important information through tone and pauses, sometimes being a barrier to building rapport and expressing empathy (Moylan et al., 2022; Predmore et al., 2017). Helpline responders also claim that the slower pace of the chat was both a challenge to overcome perfectionism and a benefit as they can take more time to compose a thoughtful response; while always ensuring they understood the person correctly (Moylan et al., 2022).

On a helpline exclusive for children, comparing callers and chatters showed that the children contacting are predominantly girls both in phone call and chat conversations (Fukkink & Hermanns, 2009a) and those who chatter were older than children who called (Fukkink & Hermanns, 2009b). The quality of the chat interaction was equal to the phone call, being superior in variables like taking child seriously, making child feel at ease, using accessible language, and encouraging child to think along, but not in offering solutions (Fukkink & Hermanns, 2009a). Children also reported feeling better after both phone call and chat conversations, with no significant differences between the two. The chat conversations improved slightly more the sense of well-being and reduced the perceived burden of the problem, than the phone calls. Nonetheless, after one month both children who conversed through chat and phone call reported feeling better and that they experienced their problem as being less severe (Fukkink & Hermanns, 2009b).

For studies comparing between three modalities, the comparison of phone call, text and online chat showed that phone calls were perceived as the most effective to achieve immediate and long-term outcomes, followed by online chat and text message (O'Riordan et al., 2022). This result wasn't affected by a lack of awareness about the online chat and text message modalities for this helpline, as nearly 90% were aware of the online chat and ¾ of the text messaging service. When comparing asynchronous support group, personal chat and phone call, suicide threats seemed to be more common in the asynchronous support group (15.3%), followed by the phone call (1.45%) and the personal chat (0.27%), especially among male first callers (Gilat & Shahar, 2007). Interestingly, Moylan and colleagues (2022) compared the use of chat and phone call between genders and found that both services seem to be more often used by females than males (Moylan et al., 2022).

A relevant benefit according to the helpline responders is that chat allows for increased privacy without anyone overhearing, more control over how the person reaching out for help presents themselves and their problems, and anonymity (Gilat & Shahar, 2007; Fukkink & Hermanns, 2009a; Moylan et al., 2022; Predmore et al., 2017). On the negative side, more unplanned or planned disconnections seem to happen on chat compared to phone call, which may be related to someone wanting to end the interaction or due to technological issues (Moylan et al., 2022; Predmore et al., 2017).

3.5 Theoretical frameworks of used for text-based crisis intervention

3.5.1 Established crisis intervention models

Only four of the studies have referred applying widely used crisis intervention models, such as ACT Crisis Intervention Model (Wong & Zhou, 2022), CARE –Connect, Attend to Needs, Reaffirm and Empower (O'Riordan et al., 2022), ASSIST – Applied Suicide Intervention Skills Training (Mokkenstorm et al., 2017) and TCM –Telephone Crisis Management (Evans et al., 2013). Despite their unique approaches and focus, all these models share the aim to effectively manage psychological crisis by establishing rapport with the individual in distress, support them emotionally depending on their specific needs and collaboratively find different solutions to the problem (through the individuals own inner resources or their social support system). Table 4 provides a detailed description of these established crisis intervention models used for text and chat intervention.

Table 4

Description of the established crisis intervention models per study

Study citation	Description of established crisis intervention models
Evans et al. (2013)	The TCM model stands for Telephone Crisis Management and consists of four to six phases which can be used for telephone call or text/ chat intervention. It consists of establishing rapport and identifying their problems, needs and risk for suicide, exploring the affect, evaluating the coping mechanisms and support system and exploring collaboratively different solutions to the problem. If the person contacting is acutely suicidal, the helpline responders will initiate emergency services. The advantage for text/ chat is that helpline responders can reinitiate contact for follow-ups, unless the person opts out of being contacted.

Mokkenstorm et al. (2017)	The ASSIST model stands for Applied Suicide Intervention Skills Training and equips volunteers to engage with people facing a psychological crisis, by increasing hopefulness and reducing their feelings of depression, suicidality and overwhelm. The model focuses on a structured approach to explore the reasons to live and reasons to die, identifying sources of support and providing comprehensive assistance to these individuals in severe distress, while emphasizing empathy, respect and understanding.
O'Riordan et al. (2022)	The CARE Model stands for connect, attend to needs, reaffirm and empower. It prioritizes making the person feel heard and connected, by focusing on reducing immediate distress and improving the person short-term outcomes. With its four phases, it explores building a rapport and a connection (connect), identifying and addressing the needs (attends to needs), validating the person's emotions and experiences, and empowering the development of adaptive coping strategies (empower).
Wong & Zhou (2022)	The ACT Crisis Intervention Model stands for assessment, crisis support and treatment and provides a structured guidance for intervening in psychological crisis. It consists of three phases, assessment (gathering information about the context of the situation, the person's emotional state and any relevant background), crisis support (providing immediate support to help restore a sense of control and stability) and treatment (after crisis is stabilized, implementing appropriate treatment like coping mechanisms strategies for the future).

3.5.2 Independently proposed multi-phased crisis intervention models

Eight studies independently proposed and applied their own structured multi-phases approaches, including a five-phase chat counseling session model (Baldofski et al., 2023; Eckert et al., 2022; Efe et al., 2023; Fukkink & Hermanns, 2009a; 2009b), models derived from psychology techniques to apply remotely during COVID-19 (Amorim-Ribeiro et al., 2021; Arena-Landgraves et al., 2022) and a model to process distress that was experimentally developed and validated during the study (Mickelson et al., 2023). All these models have in common phases that are also described by two of the main frameworks for crisis intervention (Hobfoll et al., 2007; Robert & Ottens, 2005) – building a relationship, evaluating the needs of the person in distress, providing emotional support, promoting cooperative problem-solving and referral to further support and resources. Table 5 describes in detail each of these multi-phased crisis intervention models used for text and chat interventions.

Table 5

Description of the independently proposed multi-phased intervention models per study

Study citation	Description of multi-phased crisis intervention models
Amorim-Ribeiro et al., (2021)	The Calma Nessa Hora protocol was based in models developed precisely for emergency and disaster psychosocial support. It consists of three phases, evaluation, support (active listening, problem-solving, establishing consensus on an action plan) and conclusion (referring to other services or materials if needed).
Arena-Landgraves et al., (2022)	Based on positive psychology, this protocol focuses on providing emotional support, technical guidance for the platform modules or referrals specialized care and support through chat. It consists of five phases, evaluating the reasons and needs for seeking help, offering emotional containment (e.g., deep breathing exercises), guidance towards problem-solving, referral to other services in the case of severe issues (violence or suicidal behaviour) and weekly follow-up contacts.
Baldofski et al. (2023); Eckert et al. (2022); Efe et al. (2023)	The Krisenchat protocol focuses on listen to, calm and comfort people during acute crises, also recommending further help (local and specific resources or in the health care system). It consists of five phases: building a trusting relationship, understanding the problem, clarifying the aim for the counselling session, finding a common solution, and properly finalising the counselling session.
Fukkink & Hermanns (2009a,2009b)	The Kindertelefoon protocol is specific to children and focuses on offering support, providing solutions, using language accessible to children, taking the child seriously, making the child comfortable and encouraging collaborative problem-solving. It consists of five phases, establishing contact, clarifying the child's story, determining the goal of the conversation, developing the goal of the conversation, and closing the conversation. This protocol is applicable to both the telephone and online chat support.
Mickelson et al. (2023)	The distress-processing model was developed and validated by the same authors in two different studies and published in one article. Combining empirical models (crisis intervention models and distress processing models) and practical models (transcription based), it prioritizes changes in psychological distress rather than in suicide-related thoughts or behaviors. It consists of five phases, unengaged with distress, distress awareness, distress connection, distress insight, and applying distress insight.

Two studies did not disclose the helpline name or the crisis model used, so it was not possible to gather any further information (Schwab-Reese et al., 2022; Moylan et al., 2022).

3.5.3 Unspecified approaches to crisis intervention

The remaining fifteen studies haven't named or described in detail the crisis intervention models they use, but mention the application of various techniques – building rapport, empathy, active listening, collaborative problem-solving strategies, risk assessment, follow-up care, and appropriate referrals (Cox et al., 2021; Côté & Mishara, 2022, Gilat & Shahar, 2007; Gould et al., 2021; 2022; Lake et al., 2022; Pisani et al., 2022; Predmore et al., 2017; Thompson et al., 2019; Runkle et al., 2021; Szlyk et al., 2020; Van-Wyk & Gibson, 2022; Finn & Hughes, 2008; Yip et al., 2021; Zalsman et al., 2021).

The lack of a formal framework for crisis intervention in some of the helplines should not be seen as indicative of ineffectiveness or poor practice, as many of them develop their own strategies tailoring to their context and needs. Of the studies where no crisis model was indicated, four studies focused on risk assessment, de-escalation and suicide prevention techniques (Lake et al., 2022; Van Wyk & Gibson, 2022; Finn & Hughes, 2008; Yip et al., 2021). A clinical risk assessment is the process of evaluating the likelihood that a person will pose a threat to others or engage in self-harm within a given period, it's essential for assessing suicide risk (APA; Ryan & Oquendo, 2020). Suicidal behaviour is very complex and not caused by a single cause or stressor. A number of factors may contribute to it, from mental illness, personality, exposure and means to suicidal behaviour, among others (Ryan & Oquendo, 2020). Following suicide risk assessment, it's important to promote de-escalation of the suicide risk by communicating verbally to reduce the potential for violence, be it self-harm or harming others, providing support for immediate help (Papadogiannis & Orso, 2021).

Two of the studies above and the remaining seven studies resort to important techniques like important techniques including building rapport, empathy, active listening, emotional support, collaborative problem-solving strategies, follow-up and referrals (Cox et al., 2021; Côté & Mishara, 2022; Gilat & Shahar, 2007; Gould et al., 2021; 2022; Lake et al., 2022; Pisani et al., 2022; Thompson et al., 2019; Runkle et al., 2021; Szlyk et al., 2020; Finn & Hughes, 2008). Two studies specifically mentioned providing emotional first aid/ support and appropriate referrals during a crisis (Predmore et al., 2017; Zalsman et al., 2021). All the techniques mentioned are a part of relevant psychological crisis intervention models, such as Roberts and Ottens (2005) and Hobfoll and colleagues (2007). They all contribute to different stages of establishing a relationship with the person in crisis, validating how they feel, helping the person gain control over

their symptoms and situation, promoting adaptive coping mechanisms, follow-up and referring them to services of continuity or resources if needed.

4. Discussion

Psychological support through digital technology, such as text message and instant messaging/ online chats, has been exponentially growing in the mental health sector, including for help seeking when experiencing a crisis (da Silva et al., 2015; Sefi & Hanley, 2012). This systematic review addressed a gap in the literature by examining the feasibility and effectiveness of text-based crisis intervention in mental health, across both text message and online chats.

Overall, our findings support that people facing psychological crisis do adhere to text-based crisis interventions and that these alleviate psychological symptoms, improving mental health conditions or acute distress from PTEs.

Considering feasibility, Hoermann and colleagues (2017) stated in their review that feasibility studies on text-based crisis helplines demonstrate they are reliably used by individuals in a psychological crisis, finding it useful due to its immediate availability and accessibility. We further sought to describe the texters/ chatters using these helplines during a psychological crisis to better understand the populations seeking help through these channels. Our results indicated that texters/ chatters tended to be predominantly female and younger. Two out of three individuals were female in most studies and although less reported, gender minorities were also shown to be using crisis support services. Research shows a higher prevalence of depression, anxiety, lifetime PTSD and other conditions in women compared to men, although suicide rates are higher in men (Asher et al., 2017; Bryant, 2019; Lim et al., 2018). Consistent with this evidence, men have also been shown to be half as likely to seek help for mental health concerns, which may explain the predominance of women in seeking help through text during a crisis (Judd et al., 2008).

Youth between their teens and early to mid-twenties (mostly under 25 years) appear to be the predominant users of text-based crisis services. Text messaging and instant messaging is the preference for adolescents and young adults when communicating, finding it more immediate, confidential, convenient and less intimidating (Evans et al., 2013; Goodman, 2020; Lester & Rodgers, 2012). Online chats and social media seem to promote higher disclosure of suicidal ideation (Lester & Rodgers, 2012), which is

especially important given youth report suicidal ideation at higher rates (Lake et al., 2022). This preference of text-based crisis services may be related to feeling more protected from emotional exposure and vulnerability, having more control over the conversation and over how much they reveal their feelings and thoughts (Mohr et al., 2011). On a focus group with youth, many preferred to seek help through text-based services, feeling the confidentiality encouraged sharing about their concerns (Evans et al., 2013). For children, similar to adolescents, the anonymity and confidentiality makes this type of crisis intervention less threatening and more encouraging towards sharing problems (Fukkink & Hermanns, 2009b). Though the texter/ chatter user base remains predominantly young, there's a growing use of these services by adults too (Gould et al., 2022; Pisani et al., 2012). These findings on texter/ chatters demographics are in line with previous reviews on crisis lines across phone call, text and chat modalities (Matthews et al., 2023).

Despite the large quantity of studies that did report on demographic variables, such as age, gender, ethnicity and sexuality, there was an unequal distribution among them. Most studies reported on age and gender, while only three studies reporting on ethnicity (Pisani et al., 2022; Runkle et al., 2021) and one on sexuality (Pisani et al., 2022). For LGBTQIA+ populations, no studies have evaluated the effects of using text-based crisis services use focusing solely on this demographic. It would be relevant to further explore help seeking through text-based crisis services with LGBTQIA+ populations, as they tend to be at significantly higher risk for substance use, mental health problems, and violence victimization (Coulter et al., 2019). Our review results provide a good description of target population that recurs to text-based services when in a mental health crisis. Nonetheless, these findings should be viewed with caution as some of the samples in the studies are self-selected samples.

The inclusion of a variety of different crisis contexts, including suicide, sexual assault, COVID-19, child maltreatment and multiple mental health concerns, has made this review more comprehensive. This diversity helps to contextualize the use and effectiveness of text-based crisis interventions in different real-world circumstances, from mental health conditions to PTEs. The most commonly reported psychological symptoms were depression, anxiety and stress across the different crisis contexts. The prevalence of depression (33.7%), anxiety (31.9%) and stress (29.6%) among the general population since the COVID-19 pandemic may explain why these psychological symptoms are most commonly flagged than others (Salari et al., 2020).

Another very commonly reported symptom was suicidal ideation, as a majority of the helplines were targeted at crisis in the context of suicide (43%). This is concurrent with crisis lines being a standard component of a public health approach for suicide prevention (Hoffberg et al., 2020; Roth et al., 2021). There may also be potential for expanding text-based crisis services to a wider range of mental health concerns or conditions than the ones noted in this review, as telephone helplines have also expanded in their scope over the last decades (Brody et al., 2020; Matthews et al., 2023).

Our second aim with this review was to evaluate on the effectiveness of psychological text-based crisis interventions (including text messaging and online chats). Although evidence on the effectiveness of text-based crisis services on mental health remains limited, overall findings provide support towards this type of crisis intervention being effective. In total, five out of thirty studies reported on how effective text-based psychological crisis interventions are on alleviating mental health conditions or acute distress. The main clinical symptoms that were improved were reducing individuals' crisis states, psychological distress and risk of suicide. Some studies also further characterized how the outcomes may relate to other factors, such as that the number of texts exchanged and not its length being associated with the quality of the crisis intervention. As helpline responders explore more resources and solutions with the people in crisis, the interventions seem to yield more positive outcomes (Côté & Mishara, 2022; O'Riordan et al., 2022). This evidence together with the high-risk that texters/ chatters exhibit (e.g., suicide risk), highlights the importance of the level of competency of the helpline responder and of being trained in suicide risk assessment and crisis intervention properly (Hoffberg et al., 2020; Mazzer et al., 2021). Systematic reviews on helplines across different mental health areas, such as health promotion (Brody et al., 2020), addiction (Gates et al., 2015), psychosocial concerns by youth (Mathieu et al., 2015), crisis lines (Hoffberg et al., 2020; Mazzer et al., 2021), also find it difficult to claim confidently its effectiveness, largely due to insufficient rigor in how studies evaluate outcomes.

A lack of standardized measures for the outcomes was identified across studies, typically developing questions specific for their research aims or helpline. As study designs differed, so did the measures obtained from them, ranging from qualitative to quantitative to mixed-methods data. Most reporting of outcomes was based on self-report measures through post-text/chat surveys with the people seeking help or with the helpline responders, varying in which questions were asked and how they were asked across

studies. The outcomes reported included helpline service satisfaction, mood, distress, suicidality and others, revealing a breadth of different effectiveness measures. Unfortunately, this dissimilarity limits the comparing and generalizing of the findings, allowing only more general claims on text-based crisis interventions having a short-term and immediate positive impact on mental health conditions. The absence of a widely used and validated set of measurable outcomes for crisis helplines also contributes to these difficulties in comparing effectiveness across studies (Mazzer et al., 2021). Some outcome measurements have been developed, adapted and validated (e.g., Crisis Call Outcome Rating – CCORS), but few studies have incorporated it so far. On this review only two studies measured and reported on the CCORS (Cotê & Mishara, 2021; Mokkenstorm et al., 2017).

Nevertheless, it's important to highlight that for the studies that did measure the clinical outcomes there are major challenges to gathering that data, including the anonymity of those texting or chatting, being a one-time psychological intervention and ensuring responses to a survey after facing a difficult moment that led to acute distress. These same limitations also make it difficult to measure long-term outcomes. Follow-up frames were absent in the studies with the exception of Fukkink & Hermanns (2009b), who indicating benefits of text-based intervention persisted after 1 month by improving the children's well-being and decreasing the perception of burden of their problem. While this initial finding is promising, more evidence is necessary.

Studies comparing outcomes between phone call and text-based modalities provided inconclusive evidence on which modality was most effective. Once again although evidence is reduced, results showcase that both modalities seem to have similar effectiveness in reducing psychological distress in a crisis. Only three out of the eight studies that focused on comparing crisis intervention across modalities reported on clinical outcomes. These studies population samples varied, one study reported outcomes on adults only and two on children. Thus, more evidence is needed on comparing the impact of psychological crisis intervention depending on the communication method used for all aged populations.

Due to the methodological concerns explained, the evidence for crisis text-based intervention effectiveness is mixed, but supports its impact on alleviating psychological symptoms throughout different mental health conditions and concerns. This type of intervention presents benefits such as being free/ low-cost, greater control over the conversation, the degree of privacy and anonymity exceeding that of traditional face-to-

face or phone call, and immediate accessibility from any place (Brody et al., 2020; Dwyer et al., 2021; Feinstein, 2021; Goodman, 2020; Mazzer et al., 2021; Predmore et al., 2017; Sindahl et al., 2019). Other advantages that haven't been stated before include allowing people who live in rural and remote areas, don't have access to a telephone, have a disability that prevents telephone use, to better access mental health (Dwyer et al., 2021; Predmore et al., 2017).

The strengths of this review lie in approaching this systematic review through a rigorous methodological approach by following PRISMA guidelines. Granted this systematic review provides a comprehensive analysis of text-based crisis interventions in mental health, it's important to acknowledge some of its limitations.

We note five main limitations to our review. First, the number of studies we collated although useful to provide a snapshot of this growing field is limited. The outcome measures substantially varied across studies and were measured inconsistently, not using standardized tools and questionnaires and leading to difficulties comparing studies on their outcome measures. This made it difficult to reach clear conclusions on key aspects like the effectiveness of text-based crisis interventions on reducing clinical symptoms. Despite this, the varied nature of methodologies in the studies we included (quantitative, qualitative and mixed methods) contributed to capturing a breadth of different perspectives relevant to describe the characteristics and impact of psychological text-based crisis intervention. Second, a potential for publication bias as only peer-reviewed articles that were published in accessible sources were considered, despite comprehensive search strategies. There were 2 articles that were excluded due to difficulties retrieving them online. Third, our search query parameters may have resulted in the omission of relevant studies. This can be verified in 2 articles we discovered only through Google Scholar searches as they weren't redacted in English but in Portuguese and Spanish. Fourth, a potential for risk of bias assessment cannot be ruled out as due to limited capacity there was a single researcher screening and evaluating the quality of the studies. We attempted to mitigate this risk by having this single researcher assess in two different time points 6 month apart with results showing the same outcome for the articles included. This assessment consisted of screening all articles, removing duplicates, excluding articles based on their abstract complying with inclusion and exclusion criteria, and repeating this process after for the remaining articles by reading their full-text. Ideally, we'd include two researchers working independently and reaching a consensus in the case of discrepancies. Fifth, the data we analysed was constrained by the information available

in the articles. This limitation is particularly visible when it comes to the crisis intervention model used in the study or by the helpline, as studies seldom reported it. We tried to compensate for the lack of information by exploring the helplines own websites to search for this information, but this wasn't possible for studies where the helpline name was not disclosed or for some helplines that didn't refer crisis intervention models or their approach and techniques.

Further research is needed to better understand the outcomes and effectiveness of text-based crisis intervention in mental health short-term and long-term, including under which clinical conditions it adds most value. Though we've assessed the clinical outcomes of the text-based crisis intervention (i.e., including assessing its effectiveness as an intervention), its aim was a broader description of the current evidence on this type of intervention (who is using it, what is triggering its use, the effects of the intervention and how does this intervention compare to other methods like phone call). It would benefit the field greatly for a systematic review and meta-analysis to be conducted exclusively on the effects of text-based crisis intervention on individuals' mental health and explored differences between channels like text messaging and online chat. While some differences between chat and text crisis interventions were reported throughout the text, they are from only a few studies, further investigation on how these text-based crisis interventions channels differ needs to be conducted. Regarding the replicated finding that text-based crisis interventions in mental health are predominantly used by youth, would be interesting to further inquire on whether this result is driven by the intervention or whether the increased mental health literacy present in younger generations prompts seeking help no matter the communication channel.

Unfortunately, we didn't have the opportunity to further explore our dataset and pose questions that combine variables, like for example, how do the models of crisis intervention used affect the clinical outcomes, or, the differences between text messaging and online chat crisis interventions on the outcomes. It would be interesting to further explore how these and other qualitative variables that data has been collected may relate to each other.

The clinical practice and policy implications of implementing these text-based crisis services should also be further explored. To examine how and whether they can be best utilized in the public mental health sector and what possible constraints may arise from implementing this delivery.

5. Conclusions

While the evidence for the effectiveness of text-based crisis intervention in mental health is still limited, a growing number of helplines have been integrating text and online services and studies on its efficacy are bound to increase too. This systematic review serves as a first approach to characterize text-based crisis interventions in mental health and their effectiveness. Despite our conclusions remaining tentative because of the lack of studies and standardization in reporting clinical outcomes, converging evidence does indicates support for text-based crisis intervention improving psychological symptoms in mental health crisis (e.g., suicidal thoughts) or acute distress events (e.g., sexual assault). As new technologies rapidly change, the capacity to deliver remotely accessible mental health care, like text-based support, during a crisis continues expanding and transforming mental health services.

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