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An integrative systematic review of online resources and interventions for people bereaved by suicide

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ABSTRACT

Suicide bereavement is frequent in the general population and it can have deleterious consequences on the mental health and social functioning of the bereaved individuals. However, those bereaved can face substantial barriers to receive support, and online resources may improve the accessibility of support. This systematic review aimed at examining the use and benefits of online resources dedicated to people bereaved by suicide and appraising the quality of the research in this field.

Systematic review according to PRISMA guidelines, involving searches in Pubmed, Scopus and Web of Science, conducted in August 2020. The integrative systematic review involved extracting and merging qualitative and quantitative data. Quality assessment was conducted with the Mixed Methods Appraisal Tool (MMAT).

The review included 12 studies, mostly of moderate quality. Online resources are predominantly used by middle-aged women, parents who lost their child by suicide, and recently bereaved individuals. Online resources offer a way for help-seeking around the clock for less educated, more disadvantaged and isolated people. People bereaved by suicide use online resources to seek and share support, share and find information, memorialize their loved one and for meaning-making. Negative effects of online resources are rare.

The evidence on the use and benefits of online resources for people bereaved by suicide remains scarce but show encouraging results regarding their positive impact on the mental and psychosocial health of the users.

1. Background

Suicide is a major public health problem worldwide with nearly 800,000 people dying by suicide each year ("WHO,", 2014). In addition, a large part of the population has been bereaved by suicide. It has been estimated that one suicide may affect as many as 135 individuals (Cerel et al., 2019). A recent meta-analysis found that the prevalence of experiencing suicide was approximately one in 20 people (4.3%) in the past year and one in 5 (21.8%) in a lifetime (Andriessen et al., 2017c). People bereaved by suicide have higher risks of adverse outcomes such as mental and physical illness, suicidal behaviors, and impaired social functioning compared to the general population and to people bereaved by other causes (de Groot and Kollen, 2013; Pitman et al., 2014).

The grief process following a suicide appears to share similarities with the grief after deaths by other causes (Jordan, 2001; Sveen and Walby, 2008). However, people bereaved by suicide may experience more feelings of rejection, shame, guilt, social stigma and difficulties with meaning-making (Andriessen et al., 2017b; Sveen and Walby, 2008). It has also been established that people bereaved by suicide are less likely to receive informal support and more likely to experience delays in accessing any type of help than people bereaved by other causes (Pitman et al., 2017). Despite the fact that suicide bereavement support (named 'postvention') is becoming available in numerous countries (Andriessen et al., 2017b), it seems that a gap remains between the need for help and the actual support received by people bereaved by suicide (McMenamy et al., 2008; Pitman et al., 2018;

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Sanford et al., 2016; Wilson and Marshall, 2010).

Online resources may help to overcome obstacles to receiving support, for example, via their geographic independence, offering support around the clock and easier access than off-line resources. Moreover, some web-based support can be anonymous, which could be important for bereaved individuals who feel shame and social stigma. Overall, it has been estimated that more than half of all bereaved people use digital resources (van der Houwen et al., 2010). The resources specifically for people bereaved by suicide are diverse, and include informative websites about grief and loss, memorial websites, online support groups, and online therapy and counseling (Krysinska and Andriessen, 2013). The most commonly used are support groups, social media and memorial websites (Andriessen et al., 2017b). Nevertheless, despite their availability, little is known about their use by people bereaved by suicide, nor about their potential effects. To date, no systematic review has assessed the evidence regarding the use and benefits of web-based support in this population.

To address this gap, this systematic review aimed at investigating what is known of the use and benefits of online resources and interventions available for people bereaved by suicide. Our goal was to study their outcomes in terms of grief, mental health, suicidal behavior, social functioning, needs for help and help-seeking in people bereaved by suicide. Additional aims were to identify potentially working ingredients of online resources and intervention for this population, and to appraise the quality of the research in this field.

2. Methods

The reviews was based on the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) statement (Moher et al., 2009). In PICOS terms (WHO, 2012), the review focused on people bereaved by suicide in the general population. The main intervention was the use and effect of any online resource for this population. Studies with or without comparator were eligible. Control groups could include a waiting list group, non-intervention group, other interventions or bereavement by other causes.

2.1. Inclusion and exclusion criteria

Studies were included if: (a) the study population consisted of people bereaved by suicide from the general community or age-based populations (such as schools and universities), (b) the study used quantitative, qualitative, or mixed-methods, and (c) reported data regarding the use and effects of an online resource or online or social media intervention in the bereaved individuals. Studies were excluded if: (a) the study population did not consist of people bereaved by suicide from the general community or age-based populations, (b) the study did not report on the use or effects of an online resource or intervention, or (c) did not provide original data (such as opinion papers).

2.2. Article selection process

Systematic searches were conducted in Pubmed, Web of science and Scopus. The search string used in Pubmed was [(web OR online OR internet OR digital OR social media) OR (social media OR online systems OR internet [MeSH Terms])) AND ((grief OR grieving OR bereav* OR mourn* OR surviv* OR postvention OR loss) OR (grief OR bereavement OR survivors [MeSH Terms])) AND ((suicid*) OR (suicide [MeSH Terms])]. A similar search string was used in the other databases. There were no restrictions regarding location or year of publication. However, the search was limited to peer-reviewed papers published in English and the searches were conducted in August 2020.

Two authors (LL and EL) independently selected the studies and extracted the following data: author and year, location (country), study design, study population (demographic variables), intervention setting, inclusion criteria, intervention, outcomes, instruments used, and study results.

2.3. Data analysis

We anticipated substantial heterogeneity in study designs, interventions and outcomes reported in the selected studies, which would preclude pooling the statistical data. As the data were expected to be both qualitative and quantitative, we chose to adopt an integrative and convergent method of systematic analysis. Several methods of mixed quantitative and qualitative analysis are available (Dixon-Woods et al., 2005; Mays et al., 2005). Based on the literature, we opted for a data-based convergent synthesis design. Since only one synthesis method is used for all evidence (Hong et al., 2017), data transformation was involved. Hence, quantitative and qualitative data were reviewed, analyzed, and then jointly presented and discussed in the Results and Discussion parts of this review. We conducted a thematic analysis of the qualitative data, following a three-stage process: a) coding text 'line-by line', b) development of 'descriptive themes' and c) generation of 'analytical themes' (Thomas and Harden, 2008). Concerning the measures of use and benefits, we synthesized and combined the data available in each study, weighted depending on the sample size. When possible, quantitative data were aggregated to calculate averages and standard deviations weighted on the sample size of each study. We studied the outcomes of these interventions in terms of grief, mental health, suicidal behavior, social functioning, need for help and help-seeking behaviors.

2.4. Quality assessment

The quality of included studies was assessed through the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018). The MMAT permits to appraise the methodological quality of five categories of studies: qualitative research, randomized controlled trials, quantitative non-randomized studies (estimating the effectiveness of an intervention or studying other exposures), quantitative descriptive studies (designed to describe the existing distribution of variables without regards to causal relationships) and mixed methods studies (combining qualitative and quantitative methods).

2.5. Registration

The review protocol was registered in the PROSPERO database (registration number CRD42020188116).

3. Results

3.1. Included studies

A total of 12 studies published between 2008 and 2020 was included in the review. Fig. 1 shows the selection process. Four studies had a qualitative design, four were quantitative and four were mixed methods studies (Table 1).

Three studies were from the United Kingdom (Bailey et al., 2015; Chapple and Ziebland, 2011; Hawton et al., 2012), three from Sweden (Silvén Hagström, 2017a, 2017b; Westerlund, 2020), two from the United States (Feigelman et al., 2008; Lester, 2012), two from Australia (Bailey et al., 2017; Krysinska and Andriessen, 2015), one from the Netherlands (Kramer et al., 2015) and one from the Netherlands and Belgium (Schotanus-Dijkstra et al., 2014). All studies reported data about the use of online resources, and 8 also reported data about benefits (Bailey et al., 2017, 2015; Chapple and Ziebland, 2011; Feigelman et al., 2008; Hawton et al., 2012; Kramer et al., 2015; Schotanus-Dijkstra et al., 2014; Westerlund, 2020). Included studies focused on online interventions only. No study was found regarding blended interventions (combining online and face to face components) giving data on the online component of the intervention separately from data on the face-

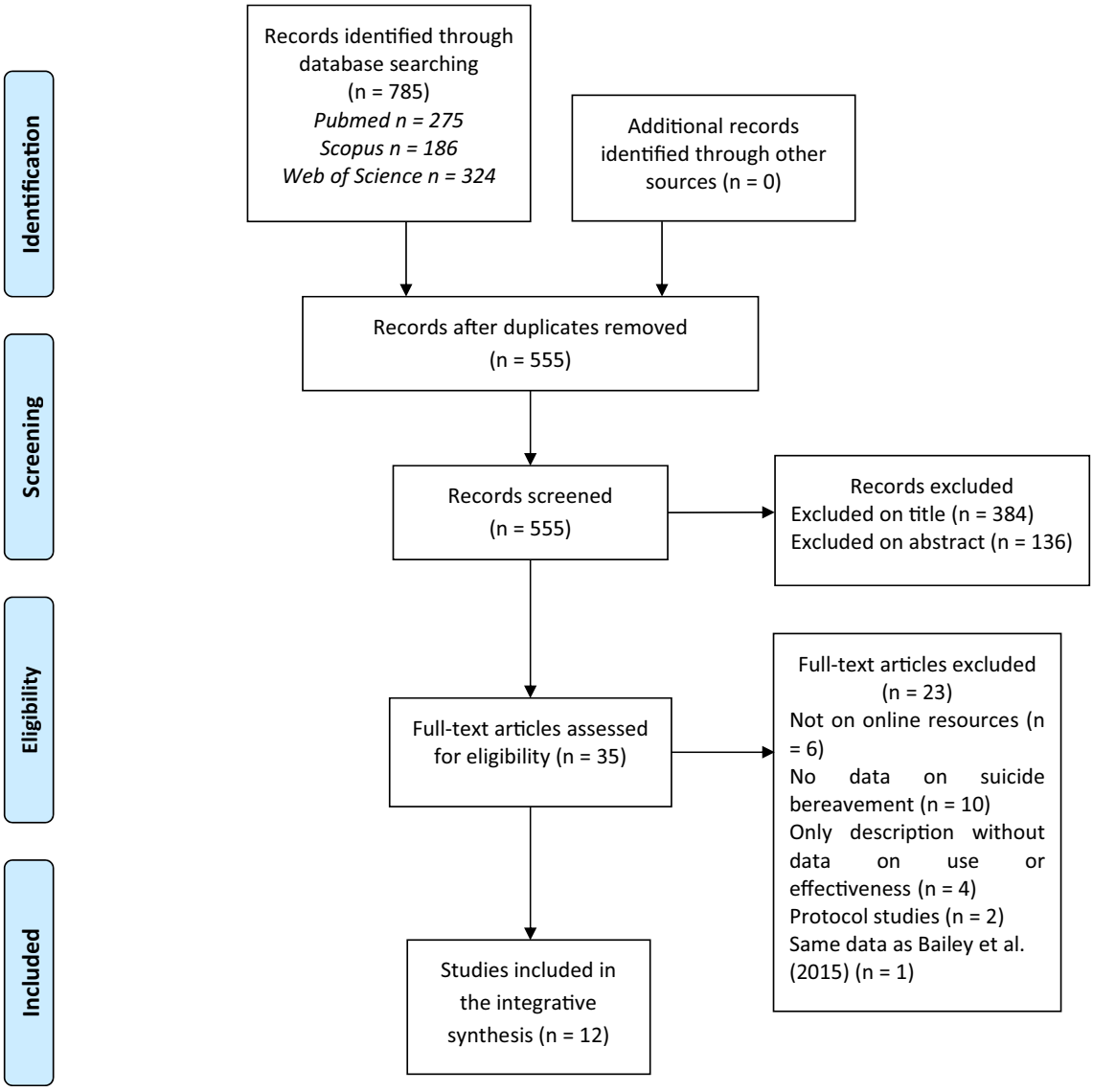


Fig. 1. Flow chart diagram of study selection according to the PRISMA guidelines.

to-face component of the intervention.

Given the heterogeneity of methods used for data collection, establishing a total sample size of people bereaved by suicide was not possible. Nevertheless, the included studies used two main methods: analysis of written documents posted online and questionnaires and interviews with study participants. Overall, the studies included 1860 chat messages, messages from 21 chat threads and 267 memorials, as well as 946 questionnaires and 51 interviews. The characteristics of the included studies are given in Table 1.

3.2. Quality assessment

The included studies varied in study quality. No total score was calculated as the instrument favors a presentation of the rating of each criterion, detailed in Table 2. Concerning the qualitative and mixed methods studies, the quality criteria were mostly followed. Quantitative descriptive studies showed moderate to high quality with all the criteria met except the representativeness of the population in 3 of the 4 studies (Bailey et al., 2017; Krysinska and Andriessen, 2015; Schotanus-Dijkstra et al., 2014). Quantitative non randomized studies adhered to few quality criteria, except for the most recent study (Westerlund, 2020).

3.3. Type of resources

Online support groups was the most described type of resource in the included studies (n = 8) (Bailey et al., 2017; Chapple and Ziebland, 2011; Feigelman et al., 2008; Kramer et al., 2015; Schotanus-Dijkstra et al., 2014; Silvén Hagström, 2017a, 2017b; Westerlund, 2020). This included forums, online support groups, and mailing groups. Forums and online support groups were located in websites where users can interact (sometimes anonymous) with each other by posting and replying to messages. They enable users to connect with others worldwide and around the clock. They are mostly managed by moderators, who are frequently users in charge of monitoring posts. Mailing groups operate the same way but use e-mails instead of posts on websites.

Five studies focused on online memorials (Bailey et al., 2015; Chapple and Ziebland, 2011; Krysinska and Andriessen, 2015; Lester, 2012; Westerlund, 2020). Online memorials consist of internet content created in memory of a deceased person. They can be available in web pages dedicated to an individual, memorial web sites and online cemeteries.

Three studies concerned the use of Facebook (Bailey et al., 2017, 2015; Chapple and Ziebland, 2011). Facebook is a versatile social media: it can be used both for private messaging and for posting content on

Table 1
Characteristics of the studies included in the integrative systematic review.

Author (year)	Country	Study design	Sample	Type of resource(s)
Feigelman et al. (2008)	USA	Quantitative non-randomized: Online survey	104 participants	Forums
Chapple et al. (2011)	UK	Qualitative: Individual interviews	40 participants	Forums, memorials, Facebook
Hawton et al. (2012)	UK	Mixed-method: Survey, focus-groups and individual interviews	23 participants	Booklet available online
Lester (2012)	USA	Quantitative non-randomized: Quantitative analysis of memorial messages	17 memorials	Memorials
Schotanus-Dijkstra et al. (2014)	Netherlands and Belgium	Mixed-method: Qualitative and quantitative analysis of forums messages	1250 messages 165 bereaved people	Forums
Bailey et al. (2015)	UK	Qualitative: Individual interviews	11 participants	Facebook, memorials
Krysinka and Andriessen (2015)	Australia	Mixed-method: Qualitative and quantitative analysis of memorials messages	250 memorials	Memorials
Kramer et al. (2015)	Netherlands	Mixed-method: Online cohort and individual interviews	270 participants	Forums
Silvén Hagström (2017a)	Sweden	Qualitative analysis of forums messages	610 chats messages	Forums
Silvén Hagström (2017b)	Sweden	Qualitative analysis of forums messages	Messages from 21 chats threads	Forums
Bailey et al. (2017)	Australia	Quantitative descriptive: Online survey	222 participants	Forums, Facebook
Westerlund (2020)	Sweden	Quantitative non-randomized: Online survey	327 participants	Forums, memorials

public "walls". Thus, it enables people to communicate with wider networks beyond the immediate relatives of the deceased person. However, it is also possible to maintain an existing account of the deceased person, or to create new pages to memorialize the deceased person, and post messages, photos or links on these pages.

Finally, one study was about a booklet for people bereaved by suicide (*Help is at Hand*) available online (Hawton et al., 2012).

3.4. Use of online resources ($n = 12$)

The use of online resources was aggregated regarding the characteristics of users, the main purposes for using such resources and the description of a particular use compared to control groups.

3.4.1. Characteristics of users ($n = 7$)

Information about users of online resources were extracted from the original studies. The user characteristics concerned their age and gender, the person they had lost by suicide and the time since loss (Table 3).

Users were mostly middle-aged individuals, with mean age ranging from 32 to 52 years (Bailey et al., 2017; Kramer et al., 2015; Schotanus-Dijkstra et al., 2014; Westerlund, 2020) or majority around 50 years-old (65% between 41 and 60 years old (Chapple and Ziebland, 2011), 49% between 46 and 55 years old (Feigelman et al., 2008)). Seven studies reported information about sex and most participants were female, with rates ranging from 70.0% to 96.1% (Bailey et al., 2017; Chapple and Ziebland, 2011; Feigelman et al., 2008; Kramer et al., 2015; Lester, 2012; Schotanus-Dijkstra et al., 2014; Westerlund, 2020). Weighted on the numbers of respondents, the overall average percentage was 87.1% of females (SD = 8.5).

In four studies reporting the relationship to the deceased, the larger part of respondents had lost a child (27.6% to 60.8%) (Bailey et al., 2017; Krysinska and Andriessen, 2015; Lester, 2012; Westerlund, 2020). Weighted on the sample size of each study, child bereavement came first with an average of 33% (SD = 16.4), followed by the loss of a partner (17%, SD = 6.5) and a sibling (17%, SD = 3.5), and the loss of a parent (16%, SD = 6.9).

Five studies provided cross-sectional data about the time since the loss by suicide (Bailey et al., 2017; Kramer et al., 2015; Krysinska and Andriessen, 2015; Schotanus-Dijkstra et al., 2014; Westerlund, 2020). Around two thirds of users of online resources were bereaved for less than five years (from 64.4% to 72%). More precisely, we measured that 31% (SD = 12) of them were in their first year of bereavement, 39% (SD = 10.5) between 1 and 5 years and 29% (SD = 4.1) were bereaved for more than five years.

Regarding accessing other types of support, four studies showed that most users of online resources also benefited from face-to-face counseling or support (Bailey et al., 2017; Chapple and Ziebland, 2011; Kramer et al., 2015; Westerlund, 2020).

3.4.2. Purposes of use ($n = 11$)

Four main themes stand out both in quantitative and qualitative studies concerning the purposes of using an online resource. Seeking and sharing support was the most frequently described theme, followed by the needs for information, memorialization, and meaning making.

3.4.2.1. Seeking and sharing support ($n = 10$). The most frequent reported reason for using online resources was to seek and share support (Bailey et al., 2017, 2015; Chapple and Ziebland, 2011; Feigelman et al., 2008; Kramer et al., 2015; Krysinska and Andriessen, 2015; Schotanus-Dijkstra et al., 2014; Silvén Hagström, 2017a, 2017b; Westerlund, 2020). Three main reasons were reported by users regarding help and support offered by online resources, namely: a) being in contact with peers ($n = 6$); b) provide help and support to others ($n = 5$) and c) discussing taboo or stigmatized topics ($n = 4$).

Looking for contact with peers (Kramer et al., 2015), having discussions with other people in a similar situation (Silvén Hagström, 2017a, 2017b; Westerlund, 2020), starting new threads of discussion and actively seeking support from other members (Bailey et al., 2017; Westerlund, 2020), were listed as reasons for joining or being active online.

Offering help and support to others by replying to messages (Bailey et al., 2017), enabling users to offer help to cope with the pain and sadness of loss (Feigelman et al., 2008), and providing support or empathy (Schotanus-Dijkstra et al., 2014; Westerlund, 2020) was also reported as a reason to use online resources.

Four studies raised the importance of the internet offering a safe place to discuss taboo or stigmatized topics (Bailey et al., 2015; Feigelman et al., 2008; Silvén Hagström, 2017a, 2017b).

3.4.2.2. Information ($n = 7$). It seemed that the type of information

Table 2
Quality assessment following the MMAT criteria.

Methodological quality criteria for each type of study[b]	Chapple et al. (2011)	Bailey et al. (2015)	Silvén Hagström (2017a)	Silvén Hagström (2017b)	Hawton et al. (2012)	Schotanus-Dijkstra et al. (2014)	Krysinka and Andriessen (2015)	Kramer et al. (2015)	Lester (2012)	Feigelman et al. (2008)	Bailey et al. (2017)	Westerlund (2020)
S1. Are there clear research questions?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
S2. Do the collected data allow to address the research questions?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1.1. Is the qualitative approach appropriate to answer the research question?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	–	–	–	–
1.2. Are the qualitative data collection methods adequate to address the research question?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	–	–	–	–
1.3. Are the findings adequately derived from the data?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	–	–	–	–
1.4. Is the interpretation of results sufficiently substantiated by data?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	–	–	–	–
1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	–	–	–	–
3.1. Are the participants representative of the target population?	–	–	–	–	–	–	–	Ct[a]	Ct[a]	Yes	–	Ct[a]
3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?	–	–	–	–	–	–	–	Yes	No	Yes	–	Yes
3.3. Are there complete outcome data?	–	–	–	–	–	–	–	No	Yes	Yes	–	Yes
3.4. Are the confounders accounted for in the design and analysis?	–	–	–	–	–	–	–	No	No	No	–	Yes
3.5. During the study period, is the intervention administered (or exposure	–	–	–	–	–	–	–	Yes	Ct[a]	Ct[a]	–	Yes

(*continued on next page*)

Table 2 (*continued*)

Methodological quality criteria for each type of study[b]	Chapple et al. (2011)	Bailey et al. (2015)	Silvén Hagström (2017a)	Silvén Hagström (2017b)	Hawton et al. (2012)	Schotanus-Dijkstra et al. (2014)	Krysinka and Andriessen (2015)	Kramer et al. (2015)	Lester (2012)	Feigelman et al. (2008)	Bailey et al. (2017)	Westerlund (2020)
occurred) as intended?												
4.1. Is the sampling strategy relevant to address the research question?	–	–	–	–	Yes	Yes	Yes	–	–	–	Yes	–
4.2. Is the sample representative of the target population?	–	–	–	–	Ct[a]	Ct[a]	Ct[a]	–	–	–	Ct[a]	–
4.3. Are the measurements appropriate?	–	–	–	–	Yes	Yes	Yes	–	–	–	Yes	–
4.4. Is the risk of nonresponse bias low?	–	–	–	–	No	Yes	Yes	–	–	–	Yes	–
4.5. Is the statistical analysis appropriate to answer the research question?	–	–	–	–	Yes	Yes	Yes	–	–	–	Yes	–
5.1. Is there an adequate rationale for using a mixed methods design to address the research question?	–	–	–	–	Yes	No	Yes	Yes	–	–	–	–
5.2. Are the different components of the study effectively integrated to answer the research question?	–	–	–	–	Yes	Yes	No	Yes	–	–	–	–
5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	–	–	–	–	Yes	Yes	Yes	Yes	–	–	–	–
5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	–	–	–	–	Yes	Yes	Yes	Yes	–	–	–	–
5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?		–	–	–	No	Yes	Yes	No	–	–	–	–

[a] CT stands for "can't tell", meaning the study do not report appropriate information to answer.

[b] Each type of study is evaluated with specific criteria. Letter/number before it refers to the type of study as followed: Sx: Screening questions for all types of studies; 1.X: Qualitative study; 3.X: Quantitative non randomized study; 4.X: Quantitative descriptive study; 5.X: Mixed methods study; number 2 doesn't appear because it refers to quantitative randomized study, not represented in this review.

Table 3
Characteristics of users of online resources for people bereaved by suicide.

Author (year)	Lester (2012)	Schotanus- Dijkstra et al. (2014)	Krysinka and Andriessen (2015)	Kramer et al. (2015)	Bailey et al. (2017)	Westerlund (2020)
Age (mean)	–	32.0	–	42.9	52.3	47
Female (%)	88.2	70.0	–	87.2	94.6	90.0
Person lost[a] (%)						
Child	52.9	9.0	27.6	20.4	60.8	40.1
Partner	11.8	21.0	8.0	27.0	13.5	16.5
Parent	5.9	24.0	9.6	25.2	8.6	13.8
Sibling	23.5	19.0	13.6	21.1	11.7	18.7
Friend	–	6.0	8.4	7.8	28.4	4.0
Other	5.9	11.0	10.0	7.8	34.7	7.0
Acquaintance	–	–	–	–	26.6	–
Unknown	–	10.0	22.8	–	–	–
Time since loss (%)						
< 12 month	–	47.0	44.8	32.2	14.9	21.4
1–5 years	–	25.0	26.4	37.4	49.5	49.9
> 5 years	–	20.0	28.8	30.4	34.7	28.7
Unknown	–	8.0	–	–	–	–

[a] Total may exceed 100% as some respondents were affected by more than one loss.

sought through the internet evolved according to the time elapsed after the death. In the immediate aftermath of the loss, studies highlighted e-mail and social networking as ways to inform relatives about the death, with easy and simultaneous access for a wider network beyond the immediate entourage (Bailey et al., 2015; Chapple and Ziebland, 2011). Seeking information for bereaved people, such as explanations about the grief process, how to tell others, or other practical issues were also cited as important reasons for using online resources (Feigelman et al., 2008; Hawton et al., 2012; Kramer et al., 2015; Westerlund, 2020). Finally, a few studies reported about sharing information with others, such as advice or links related to suicide prevention in order to raise awareness and improve the availability of mental health resources (Bailey et al., 2015; Feigelman et al., 2008; Krysinska and Andriessen, 2015; Westerlund, 2020).

3.4.2.3. Memorialization (n = 5). Memorializing one's lost loved one was mostly reported in the studies concerning online memorials and Facebook use (Bailey et al., 2015; Chapple and Ziebland, 2011; Krysinska and Andriessen, 2015; Westerlund, 2020), but it was also valued in one study concerning online forums (73% of study participants reported it) (Feigelman et al., 2008). It was pointed out that online resources enabled to commemorate the deceased and facilitated the continuing social presence of the deceased person. Studies also highlighted the use of online memorials in addition to traditional physical memorials (Bailey et al., 2015; Chapple and Ziebland, 2011).

3.4.2.4. Meaning making (n = 4). Meaning making was reported as a challenging aspect of the grief process and a reason for using online resources (Feigelman et al., 2008; Krysinska and Andriessen, 2015; Silvén Hagström, 2017a, 2017b). Forums enabled discussions between members about the meaning of the suicide, and allowed expression of personal feelings such as guilt, shame, and anger. Members discussed suicide, for example, as an involuntary act caused by depression, a failure of society and health care, or a voluntary, intentionally and blameworthy act (Silvén Hagström, 2017a, 2017b). One study analyzed the content of 250 memorials and found that 34.4% of memorials expressed the desire to understand "why" the suicide had happened and presented the bereaved person's perceived explanations for the suicide (Krysinska and Andriessen, 2015).

3.4.3. Particular use compared to control groups (n = 2)

One cross sectional study compared 17 online memorials written by people bereaved by suicide with 17 memorials written by people bereaved by other causes (Lester, 2012). Over the 73 items compared 13 were significantly different, showing that postings from suicide survivors had longer sentences and longer words, fewer references to the deceased person ("you"), more references to death, anger and sadness, and fewer references to insight and understanding.

Another cross sectional study compared people bereaved by suicide attending face-to-face groups with those attending online groups in the USA (Feigelman et al., 2008). The study reported that users of Internet support groups were significantly younger ($p = 0.002$), more frequently women ($p < 0.001$), less educated ($p = 0.02$), with lower incomes ($p = 0.02$), less religious ($p = 0.002$), more often divorced or separated ($p = 0.03$) and living alone ($p < 0.001$). Online support group users also reported to have experienced more unhelpful responses from their families ($p = 0.006$) and other relatives ($p = 0.0001$). Lastly, these users were more recently bereaved with an average time since loss of 4 years compared to 6 years in face-to-face groups ($p = 0.001$).

3.5. Benefits (n = 8)

Studies assessed the effects of resources in different ways, including perceived benefits, measurement of benefits, one comparison with a control group, and negatives aspects.

3.5.1. Perceived benefits (n = 7)

Seven studies reported beneficial aspects of using online resources (Bailey et al., 2017; Chapple and Ziebland, 2011; Feigelman et al., 2008; Hawton et al., 2012; Kramer et al., 2015; Schotanus-Dijkstra et al., 2014; Westerlund, 2020). The easy access and the possibility to use it around the clock were most frequently mentioned (Bailey et al., 2017; Chapple and Ziebland, 2011; Feigelman et al., 2008; Westerlund, 2020), followed by the anonymity offered by the Internet, as well as being able to openly discuss grief-related issues and being able to find recognition without feeling judged (Chapple and Ziebland, 2011; Kramer et al., 2015; Westerlund, 2020). One study involving online forum users reported that more than 80% of participants agreed that using the online forum helped them to feel less alone, to cope with distress and sadness, to go through difficult times (such as an anniversary), and found it beneficial to help others who were struggling (Bailey et al., 2017). However, the study of Kramer et al. (2015) found that 22.3% of users of an online forum experienced benefit from taking part in the forum, 40.1% experienced "a bit of profit" and 37.6% did not experience a benefit after 12

months of participating in the forum. One study evaluated the usefulness of an online booklet for people bereaved by suicide (Hawton et al., 2012). All users rated the content of the resource as helpful or extremely helpful, especially within the first month following the loss.

3.5.2. Measured benefits (n = 2)

Two studies investigating well-being and psychosocial health of users measured benefits (Kramer et al., 2015; Westerlund, 2020). Kramer et al. (2015) evaluated in a longitudinal cohort the changes in well-being, depressive symptoms, grief and suicide risk, at baseline, 6 months and 12 months after using an online forum. The study reported a significant increase in well-being (*WHO-5 Well-being Index*: 38.45 (SD = 21.81) to 46.27 (SD = 23.48); $p < 0.001$) and a decrease in depressive symptoms (*Center for Epidemiological Studies depression Scale*: 23.59 (SD = 12.21) to 20.12 (SD = 12.81); $p < 0.001$) at 12 months. The pre-post effect was small to medium for well-being (6 months: d = 0.24; 12 months: d = 0.36) and small for depressive symptoms (6 months: d = 0.18; 12 months: d = 0.28). There were no significant changes in grief symptoms (*Inventory of Traumatic Grief*: 80.66 (SD = 20.24) to 78.18 (SD = 21.11; $p = 0.08$)), and suicide risk (Mini International Neuropsychiatric Interview assessed medium to high risk for suicide: 20,8% at baseline and 17,2% at 12 month).

Westerlund (2020) conducted a cross sectional survey to investigate potential predictors of satisfaction with psychosocial health (Westerlund, 2020). Online support group activity was found to be significantly associated with satisfaction regarding psychosocial health ($p < 0.001$), while memorial website activity showed a tendency to a negative association, almost reaching significance ($p = 0.05$).

3.5.3. Comparison to control group (n = 1)

Feigelman et al. (2008) evaluated the differences in grief difficulties reported by users of online support groups compared to face-to-face affiliates in a non-randomized cross sectional survey. The users of online support groups scored higher on the Grief Experience Questionnaire (GEQ) (Barrett and Scott, 1989) compared to users of face-to-face groups (M = 43.9 vs M = 38.4, measure of significance not reported). Nevertheless, the interpretation of the result was hampered as there were differences between the two groups regarding demographic characteristics, time since loss, and greater stigmatization felt by users in the online group, which may operate as confounding factors.

3.5.4. Negative aspects (n = 6)

Some studies raised concerns about the potentially negative effects of Internet use, even if no adverse effect was reported (Bailey et al., 2017, 2015; Chapple and Ziebland, 2011; Hawton et al., 2012; Kramer et al., 2015; Schotanus-Dijkstra et al., 2014). A major concern was about the content of the messages, which could be too negative or depressing (Chapple and Ziebland, 2011; Kramer et al., 2015) or upsetting for some people reading conversations or talking to others (the only concern rated by more than 10% of the sample) (Bailey et al., 2017). Users also reported as a limitation of forum use the presence of people who deliberately start arguments, or post material intended to offend or upset others (9.5% agreed), the lack of action of moderators to help members who indicated they were upset (5.4% agreed) and to remove upsetting posts (4.5% agreed) (Bailey et al., 2017).

The need for more structure (Kramer et al., 2015) and for a sooner and more widely availability (Hawton et al., 2012), as well as the fear that accessing resources via a screen might not be as helpful as face-to-face for some people (Chapple and Ziebland, 2011), highlighted the concern that online resources may be a good way for reaching people, but should complement rather than replace other resources (Hawton et al., 2012). Some studies raised specific fears: using online resources could be too time consuming; there could be a risk of becoming overly attached to an online content that may disappear, or a risk of increasing loneliness if responses to messages were too slow or when the online activity would slow down over time (Bailey et al., 2015; Chapple and Ziebland, 2011). Finally, one study found that most users (90% of 222 respondents) disagreed with a statement that the use of online forums increased the risk of suicidal ideation in the users, and less than 2% agreed with the statement (Bailey et al., 2017).

4. Discussion

This first review systematically assessed the reported use and benefits of online resources for people bereaved by suicide. The review identified a limited number of studies, mostly of moderate quality. Second, it appeared that online resources were mostly used by middle-aged people, women, parents who have lost a child by suicide, and recently bereaved individuals. Online resources offer a way for help-seeking for people who may be less educated, more socially disadvantaged and isolated. People bereaved by suicide use online resources mostly to seek and share support, share and find information, memorialize their loved one and for meaning-making. Few studies have reported on the benefits of online resources. However, the findings showed mixed but encouraging results on the mental health and psychosocial health of the users.

Despite an increase in suicide bereavement research over the last decades (Andriessen, 2014; Maple et al., 2018), there is a lack of evidence concerning online resources in this field, making it difficult to establish robust conclusions. The generalizability of the findings must thus be considered with caution. However, both quantitative and qualitative data were consistent across studies. This lack of evidence indicates the urgent need to perform high-quality research, as our review showed that people bereaved by suicide actively use online resources in their grief process.

Concerning the use of online resources, our results are consistent with the reported need for support after a suicide of someone close (Oexle and Sheehan, 2020; Pitman et al., 2018). They also confirm the importance of discussing the meaning of the suicide and the struggles with "why"-questions (Andriessen et al., 2017b; Jordan, 2001). However, despite the sources of information available online (Krysinska and Andriessen, 2010), the need for information for oneself or to share with others seems to remain unfulfilled. Interestingly, we found that online resources may enhance early access to help and support for people bereaved by suicide, for whom the need for early and pro-active postvention initiatives was recently reported (Ligier et al., 2020). However, this result has to be interpreted with caution due to the cross-sectional design of studies. When comparing participants in online supports groups to face-to-face groups, Feigelman et al. (2008) found that users of Internet groups were significantly younger, more frequently women, less educated, with lower incomes, less religious, more often divorced or separated and living alone. They were more recently bereaved and had experienced more stigmatizing responses from their family and other relatives. As such, the finding indicates that online resources may be particularly interesting to reach people who might otherwise not be able to access the support they need due to social barriers. Moreover, our review demonstrated that online resources for suicide bereavement are an addition, rather than a substitute for other sources of support.

Despite a shortage of evidence of effectiveness of online resources, most studies reported perceived benefits (Bailey et al., 2017; Chapple and Ziebland, 2011; Feigelman et al., 2008; Hawton et al., 2012; Kramer et al., 2015; Schotanus-Dijkstra et al., 2014; Westerlund, 2020) such as the possibility to use the resources around the clock and to discuss grief-related topics without being judged. Having online access to support from other people bereaved by suicide was also highly valued, which is in line with what is known about the experienced value of peer suicide bereavement support (Bartone et al., 2019). Finally, some potentially negative aspects of web-based resources were reported as concerns rather than actual experiences. The need for a sooner and more widely access to the resources was reported, the risk to spend too much time on the Internet or to become overly attached to it, (Bailey et al., 2015; Chapple and Ziebland, 2011; Hawton et al., 2012), as well as the content

which could be too negative, depressing or upsetting (Bailey et al., 2017; Kramer et al., 2015). We also found that people bereaved by suicide who use online resources are more vulnerable and at–risk regarding psychosocial and mental health, so that their exposure to online content could be damaging (Feigelman et al., 2008). However, this seemed to be mitigated by the work of moderators who facilitate the use of online resources and guarantee the safety for the users (Bailey et al., 2017).

Studies included in this review reported various outcomes and used a range of measures and methods, which may hinder a univocally interpretation of the results. However, the data fitted the criteria for outcomes defined a priori for this systematic review.

In terms of grief reactions, most users of online resources confirmed the importance of finding information about mourning and discussing grief-related topics, which could be taboo or stigmatized topics offline. However, only one prospective longitudinal cohort (Kramer et al., 2015) assessed the evolution of grief reactions measured with the Inventory of Traumatic Grief and reported no improvement after 12 months.

This raises the question of assessing grief reactions after suicide more precisely. While there are commonalities in grief reactions across modes of death (Jordan, 2001; Sveen and Walby, 2008), people bereaved by suicide may experience more feelings of rejection, guilt, shame and stigma (Andriessen et al., 2017b; Sveen and Walby, 2008). Assessment of suicide grief should take these grief reactions into consideration in addition to measurement of more generic grief reactions such as feelings of sadness and anger. People bereaved by suicide are also more susceptible to complicated grief reactions (Mitchell et al., 2005) and face specific mental health challenges compared to complicated grief from other causes of death (Tal et al., 2017). To enhance the effect of online grief support after suicide, accurate assessment is essential to evaluate the impact of online resources and to identify and orientate users who may need these or other sources of support. Future studies should involve standardized instruments of grief after suicide, control groups, randomization, and both short- and long-term follow-up.

Concerning mental health, both perceived benefits and evaluated increases in well-being and decreases in depressive symptoms indicate positive effects associated with the use of online resources. However, no significant effect on grief symptoms was reported. Although negative aspects on mental health were raised, few were actually reported. While further investigations may shed light on the occurrence of such negative effects, clinicians should stay vigilant about their appearance. In this context, the role of moderators should be more specifically studied and defined as they monitor the use of online resources. This implies making sure that there are no posts intended to offend or upset users, which may contribute to the prevention of negative effects. Also, the ability to identify the appearance of potential adverse effects would improve quality control.

It is remarkable to note that only two studies collected data on suicide risk (Bailey et al., 2017; Kramer et al., 2015), which is known to be increased in people bereaved by suicide (Andriessen et al., 2017b; de Groot and Kollen, 2013). No change in suicidal risk was measured (Kramer et al., 2015) and having suicidal thoughts after using forums was the least reported negative aspect (Bailey et al., 2017). Nevertheless, suicide risk in the context of online resources represents an important issue, which warrants further attention from clinicians and researchers.

Finally, both qualitative and quantitative findings identified the need for help and help-seeking, as the most important reason for joining and being active in online resources. It confirms that the important need for support in people bereaved by suicide is often not fulfilled, and that online resources are a much-needed addition to available, mostly in-person, resources.

4.1. Strengths and limitations

This first systematic review addressed an important gap in the literature regarding the use and effects of online resources on people bereaved by suicide. The integrative and convergent analysis of both quantitative and qualitative data, offering an in-depth understanding of the use and benefits of web-based resources for people bereaved by suicide, constitutes a major strength of this review.

Nonetheless, the review has several limitations. First, the number of included studies is rather low. The overall sample of people bereaved by suicide was difficult to assess given the diversity of data reported by each study. Second, included studies had heterogeneous methodological designs and outcome assessments. Their quality was moderate, which limits the strength of our conclusions. Third, the studies have been conducted in four countries, which may restrict the generalizability of our findings. However, the ability to access web-based resources regardless of country of origin, and the resources often being available in different languages could potentially reduce this bias. Fourth, only two studies used control groups in their assessment and none used randomization.

4.2. Implications

This review provided clues concerning potentially working ingredients of online resources, valued by users. More specifically, it identified a need for widely and easily accessible resources, available shortly after the loss and around the clock, and including practical information and ways to seek and share supports between users. These types of resources are particularly important to explore in the context of COVID-19 pandemic, both with regard to the impact of physical distancing on face-to-face resources and the self-isolation consequences on mental health. Further high-quality research using standardized measures and comparators, must be conducted to assess the acceptability and effectiveness of such resources.

Prospective randomized controlled studies are especially needed to better examine the use and benefits of online resources for people bereaved by suicide in both short- and long-term. User-centered studies evaluating the design and implementation of innovative, adaptive and blended resources would be of great interest to offer an in-depth understanding of how effective support can be proposed for suicide bereavement. The impact of online resources on grief reactions and suicide risk should notably be more widely evaluated as evidence is lacking for these outcomes.

Moreover, it is essential to identify and orientate users who may need further outreach, and the potential role of moderators in this context should be clarified. In addition, machine learning may be another way of identifying suicidal ideation in online media (Tadesse et al., 2019). Its involvement in monitoring suicide risk for people bereaved by suicide using online resources would increase quality control and safety of such resources.

Finally, previous research identified priorities for the future of postvention, such as intercultural collaboration, theory-driven research and building bonds between research and practice (Andriessen et al., 2017a). The development of online resources could fit well within such priorities, as their development requires collaboration between practice and research and may result in resources available across geographical boundaries.

5. Conclusion

This systematic review found some evidence on the use and benefits of online resources for people bereaved by suicide, with mixed but encouraging results on their positive impact on the mental and psychosocial health of the users. High-quality research is urgently needed to strengthen the evidence-base in this field as people bereaved by suicide actively use online resources in their grief process.

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Declaration of Competing Interest

None.

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