Recommendations for Normal Grief Support Using a Mobile-based Intervention

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Abstract

When individuals who have experienced a loss are not given enough opportunity to make their grieving process go smoothly, this can lead to further development of their problems. Nevertheless, many individuals do not have access to appropriate bereavement support. The aim of this study was to examine possibilities regarding the development of a mobile-based intervention, to provide a relatively cheap and widely accessible treatment option for individuals with normal grief-related symptoms. Data was collected in the form of a partial literature review and in-depth interviews with therapists and grief counsellors, as an initial exploration of the possibilities regarding the use of a mobile-based bereavement intervention. Results showed that the existence of an accessible mobile-based application for normal grief support might be beneficial for many grieving individuals. Findings suggested that it might be even more valuable to extend the target group to individuals who have experienced any form of loss. When designed appropriately, the tool can be used in many circumstances, for example as stand-alone application or as an additional aiding tool for therapists or practice nurses. Multiple features are suggested for the application content, all including several benefits and risks which should be carefully considered before implementation.

Contents

1. Introduction

For every bereaved individual, grief is a unique experience. Its manifestations can vary significantly from moment to moment, and it has the potential to impact on many other areas of life (Hall, 2014; Luppa et al., 2020; Zisook et al., 2010). For this reason, everyone should be able to access appropriate bereavement support. Currently however, most therapists are unable to provide immediate help to bereaved individuals, because of the high demand for mental health treatment. Furthermore, grieving individuals or families do not always seek professional help when they need it (Aoun et al., 2015). Looking at the Dutch system, one cause for this might be that bereavement support is currently not reimbursed by health insurers. This means that people often get help too late; they will already have developed complicated grief, often with accompanying depressive symptoms.

Grief typically refers to the experience an individual goes through after a loss. If an individual has lost a significant other, it can have a large impact on their well-being and mental health (Shear et al., 2013). Although most bereaved individuals are relatively good at coping with their loss (Mancini et al., 2011), many experience extreme and varying emotions (e.g. anger, guilt) and high amounts of stress (Zisook et al., 2010). Grief reactions can be physical (e.g. insomnia, nausea), cognitive (e.g. rumination), behavioural (e.g. social withdrawal) or spiritual (e.g. search for meaning; Hall, 2014). A combination of these reactions can have detrimental consequences for a person's mental wellbeing, for instance in the form of increased mortality risk (Elwert & Christakis, 2008; Mostofsky et al., 2012; Shah et al., 2012), and the development of depressive symptoms or anxiety (Boelen & Bout, 2005; Keyes et al., 2014).

Approximately 30% of bereaved individuals is at risk of developing complicated grief (Maciejewski et al., 2016), which includes traumatic and prolonged grief disorder (Zisook et al., 2010). Complicated grief is distinct from, but in some areas overlapping with major depressive disorder (MDD) and post-traumatic stress disorder (PTSD; Arizmendi & O'Connor, 2015). Symptoms include for instance intense longing for the deceased and displaying avoidance behaviour towards everything related to them (Arizmendi & O'Connor, 2015; Shear, 2015). Consequently, individuals with complicated grief are impaired in their daily functioning, and with no treatment their symptoms will persist (Shear, 2015).

Digital self-help interventions are increasingly used within medical healthcare, to provide a widely accessible and relatively cheap treatment option for individuals with mental health problems. In recent years, the efficacy of internet-based and mobile-based interventions (IMIs) has been demonstrated in relation to the treatment of multiple mental health problems, such as depression (e.g. Karyotaki et al., 2018; Morgan et al., 2017; Twomey et al., 2017), anxiety (Morris et al., 2015) and post-traumatic stress disorder (PTSD; Lange et al., 2003; Sijbrandij et al., 2016; Spence et al., 2011). Less research has however been conducted that focused specifically on the treatment of bereaved individuals who have experienced normal or uncomplicated grief.

A digital mobile- or web-based tool will be a low-threshold, cheap treatment solution for bereaved individuals with normal grief-related symptoms. Because of its scalability it can easily reach people worldwide, providing them all with access to evidence-based research support (Muñoz, 2010).

1.1. Literature review

Research about digital interventions for grief treatment is still scarce. However, there already exist several studies which attempt to show the efficacy of web-based complicated grief treatment.

Recently, a meta-analysis has been conducted, combining the result of seven studies with the above aim (Wagner et al., 2020). All included studies focused on the treatment of complicated grief with the help of online cognitive-behavioural therapy. Wagner and colleagues describe how the overall efficacy of online grief treatment interventions was similar to face-to-face interventions. Furthermore, the results also suggest that the treatment had a strong effect on the reduction of PTSD-related symptoms.

Brodbeck and colleagues (2019) have conducted a study in which they showed the efficacy of a web-based grief treatment tool called LIVIA. This online intervention turned out to be efficacious for participants with uncomplicated grief, indicating that LIVIA might work as a preventive tool for prolonged grief disorder and depression. This is in contrast to several meta-analyses who have suggested that normal grief bereavement interventions are generally not effective (Currier et al., 2008; Neimeyer, 2010; Wittouck et al., 2011). This might suggest that there is a difference between the efficacy of face-to-face vs. web-based interventions for the prevention of complicated grief.

The above-mentioned study by Brodbeck et al. did however only recruit individuals who experienced loss at least six months before the start of the treatment. More research is therefore needed to investigate the efficacy of LIVIA as a treatment method closer to the moment of loss. Dominick and colleagues (2010) were the first to publish a study about a web-based intervention tool focused on bereaved individuals who had lost someone in the previous six months, and who did not show complicated grief symptoms. Targeting the meta-analysis of Currier et al. (2008) which showed that preventive interventions are not efficacious, they reasoned that it might still be possible for a web-based tool to speed up the process of returning to normal daily functioning for uncomplicated grievers. They developed an internet-based intervention called Making Sense of Grief: a tool that could potentially help users in gaining a better understanding of their grief, and to cope with it in positive ways. Outcomes indicate that users found the intervention generally user-friendly and helpful in learning more about ways of grieving and how to cope with it. Positive effects were found for increased attitude, knowledge and self-efficacy and reduced state anxiety. The authors note however that more research is needed about potential negative effects from using the tool, for instance for complicated grievers.

Within the group of recently bereaved individuals, as targeted in the above-described study by Dominick and colleagues, three levels of risk are identified. Aoun and colleagues (2015) describe these risks groups and their characteristics. They find that the moderate risk group, consisting of individuals who meet some (but not all) of the criteria for prolonged grief disorder (PGD), is made up of roughly 30% of the population sample. They also note how this group causes the most challenge for palliative care services, which offer support to terminally ill individuals and their caregivers both before and after the patient's death. The support these services provide should be appropriate, to prevent the bereaved from becoming part of the high-risk group. This support can also be informal support, provided in a personalized and flexible way. Examples are peer support or participation in a volunteer-led group.

This study investigated whether an internet- or mobile-based application will also be a feasible intervention to provide additional support to individuals in the moderate-risk group, as a tool to prevent worsening symptoms and therefore becoming part of the high-risk group. Such an IMI can offer multiple forms of support, for instance in the form of information (psycho-education), a place to express your feelings (journal) or a chat function to talk with peers. Furthermore, individuals of the low-risk group (appr. 10%; Aoun et al., 2015), who want to receive more support might also benefit from this application. This is because adherence to the usage of web-based tools (and therefore positive effects) is likely mediated by intrinsic motivation (Alfonsson et al., 2016).

Finally, there might be a difference in outcome when comparing a web-based application with a mobile-based application. Currently, there is no published research that evaluates the effects of a mobile-based bereavement intervention. When looking at general mental health preventive interventions however, some studies have looked at the potential of web- or mobile-based applications. A meta-analysis by Ebert et al. (2017) reviewed ten studies, from which only one made use of the mobile phone as an additional tool to easily transfer learned skills into the participants' daily routine (Buntrock et al., 2016). This indicates a lack of focus on applying the current technological possibilities to the field of preventive medical interventions. Possibilities are for example making use of just-in-time adaptive interventions (Nahum-Shani et al., 2018) or using artificial intelligence algorithms to personalize the application based on user behaviour.

Developing IMIs for bereavement support can additionally be very cost-effective when combined with traditional face-to-face practices (Blended-Concept). Using a mobile-based component as a supporting element in mental health practices has proven to increase treatment outcome (Lindhiem et al., 2015). Furthermore, statistics show a significant increase in the adoption of mental health-related apps when they are "prescribed" by providers (Aitken & Lyle, 2015). Additionally, a study by Schueller and colleagues (2016) found that mental health providers are generally interested in using web-based or mobile-based applications as supplementary diagnostic tools in their clinical practice. Schueller describes how this is in contrast with their practice, since very few providers are actually doing this.

The above-mentioned study by Schueller et al. was conducted five years ago. Between 2016 to 2021, there has been an increase in the use of technology (Statista Research Department, 2021), which could have altered the general opinion of providers about supporting technology. More importantly, no study has been conducted in which providers were specifically asked about the use of IMIs focused on bereavement support. For these reasons, in this study, (grief) therapists and grief counsellors will be asked about their interest in a digital bereavement support tool, and what aspects of it they would find most beneficial.

1.2. Research questions

This paper will focus on investigating what would be the best features and structure for a mobile-based intervention that could be used by recently bereaved individuals who are not suffering from complicated grief, however, but who may still have a small or moderate risk of developing PGD. The application will be mobile-based, as this allows for flexible accessibility and portability. The goal of this application will be the prevention of complicated grief, as well as the acceleration of the process for bereaved individuals to return to normal daily functioning. The focus for examining the structure of the application will primarily be on the four main characteristics of IMIs, as described by Ebert et al. (2017): *areas of application, human support, theory base* and *technical implementation*.

The next section will provide information about what recently bereaved individuals mostly need or find lacking during their grieving process. This information will be combined with an overview of existing features and structures of mental health or bereavement IMIs. Based on this explanation, a recommendation will be presented for the optimal structure and content of a bereavement support application. The second part of this research will consist of in-depth interviews with therapists and grief counsellors, in order to learn more about their opinions about a bereavement app that is specifically tailored to the needs of recently bereaved individuals with the risk of developing PGD.

2. Relevant IMI characteristics

Internet- or mobile-based mental health interventions (IMIs), can be characterized in a few different ways. A common way is to look at the *area of application*, the extent of *human support*, the *theoretical basis* and their *technical implementation* (Ebert et al., 2017). As for the technical implementation, this study will focus on the design of a mobile-based application with a possible extension to other digital devices. The remaining categories will be further explored below, in order to demonstrate the possibilities regarding the use of an IMI for bereavement support. The extent of human support and the theoretical basis of the intervention will be discussed together, as they both touch upon the possibilities for the content of the application.

The following section will first describe possible areas of application of the intervention. After that, it will be explained what features might be best to implement into digital bereavement support application. In order to do this, it is necessary to look at common treatment methods which have already been proven to be effective in reducing grief-related symptoms. Furthermore, additional information will be provided as to why these methods are said to be efficacious, and what needs of bereaved individuals are being met with the use of these interventions.

2.1. Area of application

There are several possibilities when it comes to the ways in which an IMI for bereavement support can be used. One of those options is to use the application as a stand-alone self-help tool, with no therapeutic intervention. In this case, the tool can be made freely available to the whole population in the possession of a mobile device. Several recent studies on mental health promotion interventions exist, which show no significant difference in outcome with or without therapeutic support (e.g. Eimontas et al., 2018; Zagorscak et al., 2018).

The amount of research for the treatment of normal grief-related symptoms specifically is too small to draw any conclusions about the effect of therapist supervision. Recently, Tur and colleagues conducted a literature review in which they looked at internet-based psychological treatments for grief (Tur et al., 2019). They included all research papers with randomized controlled trials, which focused on improving mental health in bereaved adults. Ten articles were identified, of which only one (van der Houwen et al., 2010) did not include the support or supervision from therapists. This study looked at the effectiveness of a writing intervention on bereaved participants with different risk levels for developing prolonged grief disorder. Findings indicate that the writing assignments caused a significant decrease in feelings of loneliness, and increased positive mood. Furthermore, no significant differences were found between the individuals with different risk levels. This not only indicates how grief interventions without therapeutic support can still be effective, but also that individuals with lower risk on developing PGD might also benefit from these interventions.

Disadvantages of self-guided mental health promotion interventions in comparison to supported interventions can be attrition (i.e., dropout) and reduced adherence, which will lead to decreased efficacy. A study by Alfonsson and colleagues however, showed how self-guidance was not a moderating factor when predicting adherence (Alfonsson et al., 2016). Rather, the amount of adherence was correlated with things like treatment credibility, a focus on long-term consequences, and intrinsic motivation. Renfrew et al. (2021) describe in a meta-analytical review how some self-guided conditions had comparable rates of adherence and treatment outcomes as supported treatment. They also state, however, that humans often desire access to some form of human support.

2.1.1. Increasing adherence and attrition

Based on the research stated above, it seems good practice to design a digital intervention with the complementary goal to increase treatment credibility, intrinsic motivation and focus on long-term consequences. A factor that could play a significant role in this is the element of gamification (Cugelman, 2013). Intrinsic motivation can be raised by including fun and engaging elements in a tool, adding social interaction possibilities, or rewarding goals. These elements should however be implemented with caution: Alfonsson et al. (2016) mention how a user's perceived treatment credibility might be undermined when they can no longer take the intervention seriously. They also mention how these feelings of credibility might be addressed by better informing the user about the treatment format.

Additionally, the self-determination theory suggests that intrinsic motivation can increase by improving an individual's perceived autonomy, relatedness, or competence (Ryan & Deci, 2000). Especially autonomy appears to be a crucial element, as it has been shown how intrinsic motivation will increase when users are provided with the autonomy to choose their own preferred support option and feature within an IMI (Yardley et al., 2016).

Other elements that have the potential to increase adherence to a digital tool are focus on long-term consequences by occasionally reminding the user of the treatment goals. In addition, everyday prompts or reminders could potentially increase feelings of engagement with the tool as well, but further research on this field is needed to confirm these presumptions (Alfonsson et al., 2016; Alkhaldi et al., 2016).

2.2. Application content

This section is focused on the application content in terms of its theory base, and the extent to which the application is built around individual use or external guidance or support. Different features will be described, either specifically related to grief or more generally connected to improving mental health.

All features will be further set out and assessed on usefulness with the use of previous research or an example of a successful implementation. There has not been found one implementation that contains all features, therefore multiple examples will be discussed. In spite of this, some discussed features are not accompanied with an implementation example, as there might not be one available that has been sufficiently scientifically substantiated. In addition, it is important to notice that the information depicted below is not a complete review of all existing grief-related IMIs or IMI research, as this goes beyond the scope of this report.

2.2.1 Cognitive and behavioural techniques

As Ebert and Erbe (2012) describe, IMIs are best suited for techniques that are focused on changing thoughts or behaviour. A good example of such a technique is cognitive behavioural therapy: a method that is already frequently used by mental health providers and demonstrated to be effective in treating complicated grief (Lichtenthal et al., 2011).

In the case of complicated grief, cognitive and behavioural impairments are typically addressed with three techniques: exposure, behavioural activation and cognitive restructuring (Neimeyer & Smigelsky, 2018). Application of these techniques has been shown to help individuals return to a normal grieving process, and prevent further stagnation (Bryant et al., 2014). The research by Bryant and colleagues suggests that it is important to not only focus on cognition, but to also promote confrontation and active processing of the loss.

Brodbeck et al. (2019) have shown how internet-based cognitive-behavioural interventions might also be beneficial for bereaved individuals experiencing low or medium levels of grief. In their study, they have designed an intervention based on Worden's task-based model of grief (2009) and the dual-process model of Stroebe and Schut (1999). The resulting program consisted of ten different self-help sessions, which included psycho-education about loss, assessment of the participant's current situation, loss-oriented interventions focused on exposure and acceptation, and restoration-oriented interventions focused on self-care and finding positive emotions and relationships for a meaningful future.

2.2.1.1. An existing implementation: Minddistrict

Also specifically focusing on changing the way in which people think or act, is an eHealth platform called Minddistrict (*Digital mental health platform for healthcare providers | Minddistrict*, n.d.) This platform offers a wide variety of modules, focused on promoting mental health through behavioural change. The ideas presented in these modules are all based on techniques of behavioural change (Abraham & Michie, 2008), and all programs are carefully constructed using intervention mapping (Bartholomew et al., 2016). The platform of Minddistrict is not meant for independent use, but can be offered to users through their healthcare provider. The platform is therefore tailored towards combined usage with therapeutic sessions. With the platform, users can communicate in a secure way with their health provider, and follow self-help courses or treatments. Furthermore, Minddistrict can be an aiding tool during therapy sessions, as health providers can choose specific modules to show to the client.

One of the available modules is specifically tailored to grief. This is quite an elaborate module, in which users must follow a certain pathway to complete it. This module about grief consists of various parts. The first (psychoeducational) part focuses on explaining what grief entails. This part also describes that grief not only occurs after someone's death, but it can also happen after the loss of a relationship or job, for instance. This indicates that the module is developed not only for loss after a death, but for all kinds of losses that users might have experienced. After this, there is a part about helping the user to acknowledge their loss, promoting

active processing, and helping to integrate the loss experience. The section that follows offers different exercises or creative activities that might help the user to process the loss in different ways. The module ends with a part where the user is encouraged to think about how their direct environment might be a beneficial aid in their grieving process (*Digital mental health platform for healthcare providers | Minddistrict*, n.d.).

Minddistrict has an element of autonomy, where users can choose which specific part of the application they want to see. In addition, the content and interactive element match the user's previously indicated needs and thoughts.

2.2.2. Creative exercises

The use of one's body as a way to process grief is common practice among conventional health providers. There even exist art therapists, who are specified in helping their clients with practical and creative exercises. Neimeyer (2015) described how creative interventions can help a bereaved individual to have a healthy and meaningful continuing bond with the deceased. Examples of these creative expressions are writing a letter addressed to the deceased, or personal ways to privately or publicly commemorate the lost person.

2.2.2.1. An existing implementation: Minddistrict

As mentioned in the section about cognitive and behavioural techniques, the eHealth platform called Minddistrict makes use of different modules that users can choose from, targeting their needs. In the module about grief, there is a section that sets forth different exercises for people to express their feelings in multiple ways. These options include writing a letter to the deceased, making craftwork, creating a dedicated place of honour for the deceased, crafting a box for memories, or creating a body-emotion map. All these options are not mandatory, so that users can still choose whether they prefer using them.

2.2.3. Place to store memories

As mentioned above, the grief module of Minddistrict presents an exercise in which users can craft a memory box, to store physical objects of photos related to the deceased. Additionally, an application can offer the space to store photos, videos, sound or text, related to the deceased. This is especially relevant as the world is becoming increasingly more digitally-inclined. Furthermore, a digital device is necessary to store memories that have an aspect of sound or video.

In their research about online bereavement resources, Chapple and Ziebland (2011) describe how online memorials can be accessed and modified at all times. They can also be made public to specific persons. On the other hand, memorial websites may increase or amplify ruminations, subsequently increasing emotional distress (Westerlund, 2018). In their study, Westerlund describes how participants perceived online memorial websites to be of minimal usefulness.

2.2.4. Psychoeducation

Like in the eHealth platform of Minddistrict, psychoeducation can be included in a cognitive behavioural program. In this case, it might be beneficial to start with this module, as it is important for grievers to feel like they are allowed to grief, and they know what it entails, before they can start working on actively processing their loss. Dominick et al. (2010) mention this in their research, which was focused on developing a psychoeducational grief tool for uncomplicated grievers. They found that this online self-help program was perceived to be helpful and user-friendly, but also had a positive effect on participants' self-efficacy and state anxiety.

In a recent study by Knowles et al. (2017), researchers examined the effect of online social support on several factors related to grief and depression. In both the experimental and the control conditions, widowed participants were granted access to psychoeducation relating to grief. This included information about the importance and role of sleep in maintaining a healthy lifestyle and promoting mental well-being. However, the experimental condition

also let people participate in an online virtual reality support group. Results indicated that both groups showed significant improvements in grief severity and cognitions. Furthermore, both group showed a significant decrease in loneliness, perceived stress, yearning and sleep quality. The most pronounced difference was that only the social support group also had reduced levels of depression. These findings suggests that psychoeducation can be effective when it comes to reducing grief-related symptoms and promoting mental well-being.

2.2.4.1. An existing implementation: Apart of Me

Apart of Me (*Apart of Me - Helping young people cope with grief*, n.d.) is an example of a mobile app that has implemented psychoeducation as integrated in a game for young people. The app is specifically designed to help children in the age range of thirteen to sixteen years old in their grieving process. The content of the application has been created in co-operation with child psychology experts and bereaved young people, and has won multiple awards related to emotional support applications. It is freely available for download, and is available in four languages, namely English, German, Spanish and Italian.

As said before, bereavement support is offered in the form of a game, where users can discover an island full of possibilities. For instance, they can find message in bottles in the ocean, with information about what is grief, and how does grief look in different cultures. Furthermore, users can catch fireflies, which represent a certain emotion. They will then learn more about the emotion, and how it can be related to grief.

A qualitative evaluation report about this application described how the information that both the messages in the bottles and the fireflies provided was perceived to be useful and interesting. Additionally, having to catch the fireflies has stopped users from being overwhelmed by a lot of information, and has allowed them sufficient time to consider their content (*Apart of Me - Qualitative evaluation report*, n.d.). This suggests that it might be beneficial, for children at least, to be provided with information in such a way that they cannot access everything simultaneously.

2.2.5. Journaling or writing assignments

Journaling is common practice among many individuals, not only in the field of grief processing. By writing down their feelings, it might help individuals to clarify their thoughts or express themselves in a creative way. As these consequences are also useful in the process of grief, individuals who experienced a loss might be benefitted by writing down their feelings. For instance, Pearlman and colleagues (2014) note how journaling can be very effective for the integration of one's loss experience.

Additionally, writing assignment that are targeting one's experience of loss might also be beneficial. By guiding the user in their writing process, it can help them to bring their focus to aspects of grief they have been avoiding. In their meta-analysis, Wagner et al. (2020) state how expressive writing assignment have been shown to reduce symptoms of prolonged grief disorder. Reasons for this include the promotion of reflection on the loss, and the facilitation of sense-making. The researchers conclude that writing assignments which encourage self-disclosure and confrontation of one's feelings should be considered in the development of digital grief interventions. This statement is further substantiated with the research of Van der Houwen and colleagues, described in 2.1. Area of application (van der Houwen et al., 2010). These researchers have studied the effectiveness of unsupervised writing assignments on bereaved individuals. Their findings show that the writing assignments increased positive mood, and decreased emotional loneliness.

2.2.5.1. An existing implementation: Minddistrict

Both Minddistrict and Apart of Me, described in earlier sections, have included the possibility of doing writing assignments in some way. In Minddistrict, one can follow different dairy modules, which will guide you through a few questions every day. A useful feature of this module is that is can be linked with the user's health provider, making it possible for them to get more insight in their client's habits and well-being (*Explore our ehealth platform functionalities*, n.d.).

2.2.5.2. An existing implementation: Apart of Me

In Apart of Me, the writing assignments are more related to grief and integrated in the story of the game. In this application, the user is asked to complete certain 'quests'. These quests can consist of different questions, for instance related to a positive memory of the deceased. It is then asked of the user to complete the quests by writing about this, or to talk about this with others. Results of the qualitative evaluation of the application show that these quests are received as positive, mainly because they allow users to focus on happier times, and to form positive connections with family members. However, some participants seemed to find the quests slightly overwhelming, indicating that it is good to keep this as an optional feature. A suggestion for improvement of the module was to make it possible to store the information that the users have written down, so that those positive memories can be accesses at all times (*Apart of Me - Qualitative evaluation report*, n.d.).

2.2.6. Mindfulness techniques

Mindfulness can be described as the practice of consciously and non-judgementally experiencing the present world. This does not only include one's surroundings, but also one's own thoughts, emotions, and feelings (Gunaratana, 1994). Over the years, mindfulness practices have proved to be effective for several mental conditions, including different forms of grief (Hasha, 2015). In her article, Hasha describes different examples of useful mindfulness practices, among which a technique named Dialectical Behaviour Therapy. This technique puts an emphasis on experiencing emotions, rather than avoiding them. It also encourages users to act towards living a purposeful life. Both aspects have been shown to be key factors in a healthy and flowing grieving process, when they receive enough attention (Hall, 2014).

Hasha also describes that it can be effective to teach clients how to use mindfulness at home, so that they can always use it, without supervision (Hasha, 2015). In their meta-analysis, Renfrew and colleagues mention how mindfulness as an unsupported self-help tool for promoting mental health conditions has shown to be equally effective when support is available (Renfrew et al., 2021).

2.2.6.1. An existing implementation: Apart of Me

In the before-mentioned application called Apart of Me, users can collect different gemstones, which all unlock different guided meditation sessions. Users reported these sessions to be quite calming. They liked the different options and the short length of every session, which prevented the sessions to become boring. A suggestion was to let users choose a voice to listen to, as the one available option did not appeal to every user (*Apart of Me - Qualitative evaluation report*, n.d.).

2.2.7. Emotional check-in

An emotional check-in would consist of a regular moment in which users can reflect on their emotions, for example once a day. This idea of is closely related to the techniques of journaling and mindfulness, presented above. It is similar to journaling since it makes use of guided questions to prime users in the direction of active processing. Furthermore, just like mindfulness it focuses on becoming aware of, and acknowledging, one's emotions. Both of these aspects are related to emotion regulation and challenging avoidance, aspects that have been shown to play an important role in the grieving process (Eisma & Stroebe, 2021).

2.2.7.1. An existing implementation: Minddistrict

Minddistrict offers the described functionality in his program as part of its dairy modules. One of those modules is focused on emotions. When activated, the user will receive a daily reminder to fill in this dairy. Within the module, the user is then asked about the strength of their present emotions and their accompanying bodily sensations. When the user's account is linked to a therapist, their therapist will be able to monitor the results (*Explore our ehealth platform functionalities*, n.d.).

2.2.7.1. An existing implementation: Apart of Me

Apart of Me does not make use of regular notifications. Instead, the emotional check-in can occur after the user has opened the application. This check-in is focused on recognition and awareness as well, but it is additionally tailored to the acceptance of these feelings. First of all, the user is asked to take a moment to breath and reflect on their feelings. Then, they are asked to choose from a wide range of emotions, sorted by visual categories (e.g. a laughing or crying face). After this, the user can indicate to what extent they think their indicated feelings are allowed to be there. The qualitative evaluation report indicated how this was a key element of the application, with a positive overall response. However, it should also be noted that this reasoning mostly held for the target group of children between thirteen and sixteen years old; older teenagers generally found the feature to be somewhat childish (*Apart of Me - Qualitative evaluation report*, n.d.).

2.2.8. Promoting family interaction

2.2.8.1. An existing implementation: All the Stars Above

This module is mostly based on an implementation as described by Neimeyer (2012). In this book, a therapeutic tool is explained called All the Stars Above. This is a physical game that can be played with a group, developed by Daisy Luiten. Within this game, players have to answer questions or complete exercises related to their loss. The game includes many questions, sorted by different categories. This facilitates the process of looking at one's grief from multiple perspectives, and it promotes interactivity with peers or family members. It should be noted that All the Stars Above is specifically meant to be played in therapeutic setting. As Daisy Luiten explained, the game is developed based on the needs of therapists. Some questions, for instance, are not suited to be answered without therapeutic oversight as they carry the risk of evoking tension (*Daisy Luiten - Creatieve Therapie en Verliesverwerking - Media*, n.d.). When creating a digital multiplayer question game, based on this therapeutic tool, the available questions should be considered carefully.

2.2.8.2. An existing implementation: Apart of Me

In Apart of Me, users can get assigned quests that they have to complete. Within these quests, the option is given to talk to certain memories with family members, or exchange experiences. This encourages positive interaction, and social connection to your loved ones. It can also contribute to the integration of the loss, and help the users to discover novel stories about their loved one (*Apart of Me - Qualitative evaluation report*, n.d.).

2.2.9. Online social support

In a meta-analysis of social support after grief by Logan, Thornton and Breen (2017) the significance of having access to social support after a loss is emphasized. The researchers mention how there are often shortcomings in bereavement support that is provided by an individual's surroundings. Seeking online support is a useful means to largely extend one's support network, and to find others with similar experiences. Westerlund (2018) specifically mentions the use of *online* social support as a recourse for Swedish suicide bereaved individuals. Findings of their survey study show that bereaved individuals generally perceive online support group to be beneficial. A reason for this could be that they provide a anonymous environment in which individuals can find people who show a better understanding than their own family or friends (Feigelman et al., 2008). Additionally, online bereavement support groups may improve well-being and depression (Knowles et al., 2017).

In spite of these advantages, the possible downsides of using digital resources should not be forgotten. Westerlund (2018) points out as well how the digital resources might for instance hold the potential to amplify negative ruminations in the bereaved.

2.2.10. Chatbot

Last to be discussed is the idea of using a chatbot as a support companion within a bereavement intervention. Many individuals nowadays are using companion chatbots like Replika, a messaging chatbot without a specific treatment aim. This messaging chatbot has shown to be a useful means to provide accessible social support (Ta et

al., 2020). Further research will be needed to examine whether chatbots will also be effective for bereavement support (Smaak, 2022). Additionally, chatbots might also serve as an effective tool to oversee the severity of one's grief (Abd-alrazaq et al., 2019).

3. Method

3.1. Participants

For this study, data collection was carried out in the form of one-to-one in-depth interviews. This method was suited for this study, since the aim was to collect data as an initial exploration of the possibilities regarding the use of an IMI for bereavement support. Participants that were interviewed for this study (N=6) were therapists or grief counsellors in the region of Zuidoost-Brabant, the Netherlands. This group of mental health providers were selected because they are most able to judge the need for and feasibility of a digital mental health promotion intervention focused on grief. Furthermore, approval from this group of people will likely result in a more rapid adoption of such a tool, as they are able to use it during their practice or refer clients to it. In order to obtain a large enough sample size, mental health providers in the region of Eindhoven were contacted by email, and asked whether they knew any other potentially interested colleagues. This combination of convenience and snowball sampling was the most feasible method given the scope of this study. For the same reason of feasibility, no other inclusion criteria were used, except for the above-mentioned field of work.

From all contacted therapists and grief counsellors, six participants agreed to an in-depth interview. From those participants, two of them worked as first-line mental health psychologists, and two were clinical psychologists. The two remaining participants were specified in working with grieving clients, from which one was a grief counsellor, and the other person a psychosocial therapist. Table 1 shows all obtained participant characteristics.

Table 1 Characteristics of the participants

Participant characteristic	*n*
Gender	
Female	4
Male	2
Age	
31-45	2
46-60	2
61-75	2
Client demographics (mainly)	
Adults (18+)	4
Young adolescents (14-26)	1
Older adults (45+)	1

3.2 Procedure

Two of the interviews were conducted in an online environment, while the rest took place in the work environment of the health provider. These locations included various addresses in the area of Eindhoven, the Netherlands. The interview itself consisted of around twenty questions. Most of those questions were closed (e.g., do you think this feature might be helpful for certain people?), with open-ended follow-up questions in order to obtain well-substantiated opinions (e.g., for which people or in which situation might this feature be helpful?). The questions were mostly focused on the participant's experience with grieving clients, and their opinion about the use of a digital application with varying feature options and means of use. The feature options that were presented to the participants were all based on the above literature section.

3.3. Data analysis

Every interview has been transcribed completely. If one feels the needs to look into the transcribed data, it is possible to contact the researcher of this study. After the transcribing was finished, all transcripts were reviewed for coding. The subsequent identification of themes has been done via an inductive approach. This means that the themes were formed only based on the available data, without the influence of any previously acquired knowledge on the subject. Furthermore, the data was organized and summarized using a semantic way, as its deeper meaning was not taken into account (Braun & Clarke, 2006). This was done as the interviewed target group was chosen because of its professional field knowledge, and because this study only serves as an initial exploration of the application area and content of a digital bereavement support intervention.

4. Results

All six participants have elaborately shared their unique perspectives on the topic of grief, with a mean interview time of approximately one hour. The analysis of the data revealed seven distinct themes, which are presented below. The first four of those themes are directly related to a digital application for bereavement support. These themes are, (a*) aims and benefits*, (b) *target group*, (c) *practical use* and (d) *application features*. The last three identified themes are also included in this report, as they may indirectly reveal design implications for the intervention. These themes are (e) *what is grief*, (f) *normal grief treatment*, and (g) *grief treatment is not reimbursed*.

4.1 Aims and benefits

4.1.1 Low-threshold

During the conversations, mental health providers often mentioned what they thought was beneficial to the use of a digital bereavement support application. One noted benefit of such an application was that it would provide individuals with a low-threshold, easily accessible tool to support them during their grieving process. This is especially important for younger people, as they might think it not acceptable to show that they need help.

> *"You see that young people then start closing themselves in, yes you see that happening now with COVID-19, for example. That young people are having a really hard time. Yes. And then I think that such an app can really be a very good addition. Because you don't have to tell that to others *laughs*."*

As an added benefit, the same participant mentioned that she thought that the use of such an application would lower the threshold for individuals to seek actual professional help when it is needed. "*And then the step is also a little easier, I think, if it is necessary to speak to someone offline, that, yes, that it will go better.*" This might be important, especially for stigmatizing deaths like suicide (Hall, 2014).

4.4.2. Safe environment

The existence of a digital application also presents users with the possibility to express their feelings in an anonymous and non-judgmental online environment, and they can use it in their own safe space at their own pace.

4.4.3. Improved client communication

One participant also focused on the benefits regarding client communication. When therapists would have access to the app as well, they can use it as a tool to exchange messages with the client in a secure environment. The participant also noted it might be an extra advantage when therapy sessions can be held online in such a secure environment. This is especially relevant looking at the current global COVID-19 pandemic, restricting face-to-face client contact.

4.4.4. Eased grieving process

Participants also explained whether they thought a digital application can help in easing the grief process. There was a general agreement that the application might help users to get more insight into their emotional and behavioural patterns related to grief, which can in turn increase well-being. Furthermore, the application might expedite the transition to normal daily functioning of the bereaved individual. However, most participants also said they did not think it was good to have the aim of *speeding up* the grieving process, as this might lead users to skip over the essential step of actively processing and integrating their grief.

> *"But in grief, the goal is never that it goes very quickly, because it can also take the form that after a year uh .. I don't know, that someone is going to get married and that suddenly in that situation you suddenly becomes very sad again, that's okay too, so it doesn't necessarily have to be fast, (…)."*

4.4.5. Complicated grief prevention

Opinions were even more divergent when it came to the question of whether the application would be effective as a stand-alone intervention in preventing complicated grief. Half of the participants thought that it was possible to use the application as an aiding tool in removing possible obstacles in the way of a normal grieving process. The other half thought that therapist involvement was necessary for this, as complicated grief is caused by multiple layers of complex personal circumstances:

> *"The complexity the often lies in the fact that there are many different situations that interact with each other, and… yes, I do not immediately see how.. how an app, that complexity, how it deals with that complexity."*

One health provider, however, mentioned how complicated grief can also occur because of the way our society is built. In western culture, it is expected of individuals to move on with their life shortly after the event of their loss. This might happen even more so in cases of loss without someone dying, as people often do not link a loss of for example a job or a relationship to a need for grieving. Because of this avoidance of their bodily feelings, further problem development can occur.

> *"And, how we grieve is often also part of the system in which we function. That is the family system, but also the system of culture. Where, we Dutch, are like hoopla it happened, we have to move on. And you see that really, um, it's kind of become a mantra for people, like yes but I just have to keep going, I can't be weak, I can't fail, and that's why they stow away their whole physical reaction. So you get an inner split, where head and body… no longer work together in one line. And then there will be complaints."*

If this is indeed the case, complicated grief or prolonged grief disorder might be prevented with the help of an online intervention that can normalize grief and promote active processing.

4.2. Target group

During the interviews, it was mentioned that the application was targeted at bereaved individuals experiencing normal grief-related symptoms. Even so, participants often suggested elaborations or alternatives on this target group, depicted below.

4.2.1. Different kinds of losses

First of all, several health providers mentioned how many people still think that grieving is only allowed when someone has died. They stated that this is not the case, as people grieve about a wide range of losses. An IMI might in this case be a helpful tool to normalize grief for individuals struggling with loss other than the dead of a person.

"I, uh, I think it's good to make it broader than just death. I still notice that, the vast majority still thinks about grief, they link it to death. But it's so much broader. And if that application can just show that, that would already be... Yes, that is very nice."

4.2.2. Individuals with normal grief

Most participants also emphasized that it should be clearly explained that the tool is specifically meant for individuals with normal grief. This would be the best target group for independent use, as individuals with more severe grief-related symptoms need additional support.

4.2.3. Digital device affinity

Multiple times during the interview, health providers raised the issue of working with a digital device. Not everyone has an affinity with working on a digital device, as they prefer the analogue version of journaling, storing photos, or chatting with others, for instance. As one participant noted, "*Of course someone has to be open to doing that, independently, on a digital device.*" Moreover, grievers should also have access to a digital device, or possess sufficient skills to handle them.

4.2.4. Younger generation

As mentioned under the theme of *Aims and benefits*, it was indicated that especially younger people might benefit from an accessible and low-threshold application. Furthermore, it was stated that the intervention will suit young people even better when psychoeducation is delivered in other ways than written text. Examples of this are videos or interactive quizzes.

4.2.5. Individuals in environment of the griever

Lastly, it was mentioned once that it might be a good idea to also target people in the immediate surroundings of the bereaved. Those people might find it helpful to have access to a module that can explain how to support their bereaved friend or family member. Further elaboration as to what was the right way to do this or what often goes wrong in this process was not provided.

4.3. Practical use

The following section will set forth the different ways that the application can be used, as proposed by the participants.

4.3.1. Stand-alone grief treatment self-help intervention

Several health providers mentioned that they would refer bereaved individuals to the application, as it might be a useful tool in supporting normal grief. Additionally, they might make someone who is seeking their help aware of the tool, when they think their grief story is not complicated. One participant adds to this that it is also a good idea to refer clients to the tool when they seem to prefer independent practice.

An additional consideration for almost all participants was the fact that grief treatment is not reimbursed in the Netherlands. Several health providers stated that such a digital intervention will be a good option for all individuals who cannot access professional help because of this law (see also 4.7. Grief treatment not reimbursed).

4.3.2. Assisting in a general practice

Half of the interviewees additionally mentioned that the tool could be used within general practice, as they will support the group of help-seeking individuals with mild or moderate problems. A mental health nurse could use the tool to aid this support, or they could refer the client to independent use, in order to save health costs.

"Look, you're talking about mild to moderate problems. Yes, I think that this can also be supervised very well by a practice nurse. So that would be very good if that were the case, because you naturally prevent further problematization by doing so, and you also emphasize self-direction."

4.3.3. Assisting therapist or grief counsellor

A few health providers described how such an application could be just as useful for reducing complicated grief symptoms. However, human support was needed to first unravel the exact area of stagnation or to provide additional guidance throughout the whole process.

> *"Yes,* [the app would be useful] *at least more for people who are simply in a grieving process, so not so much with the stagnated or traumatized grief. Then it can be a supportive app, I think, parallel to a treatment process, with a therapist, I think that can be very valuable. Yes, so maybe in fact everywhere, only with that second target group that you can supervise it more intensively. And that it is not the main treatment."*

Several health providers stated that they would use the application as an aiding tool for their therapy sessions. For this to be possible however, different features or modules in the application should be independently accessible. This way, therapists could for example use the feature of mindfulness to practice this with their client.

Lastly, it was mentioned how some clients like to be able to work on material themselves in-between the sessions. An IMI could provide this opportunity for them to continue the therapy sessions by themselves at home.

4.3.4. Other

This last section provides a short overview of additional possibilities regarding the use of the tool.

4.3.4.1. Middle school grief education

Firstly, a psychologist thought that it was useful to promote the tool in middle schools. This way, children could use the psychoeducational part to learn what grief entails.

4.3.4.2. Group therapy assistance

The same participant also stated that the tool could be used in physical group therapy sessions. Supervisors could share psychoeducation about grief as depicted in the application, or use creative exercises or interactive question games to guide the meeting.

4.3.4.3. Waiting list bridging

Finally, a notable suggestion was done by a psychologist who thought it might be useful to make the tool available to clients on their waiting list. This provides people with an opportunity to work by themselves before being able to access additional support. It might also accelerate the subsequent therapy process when the clients' problems have not completely subsided.

4.4. Application features

In order the systemically review the suggestions of the participants, all discussed feature ideas for the application are summarized in Table 2. The features are categorized by the possible needs of the user. Below, all features present in Table 2 or explained in more detail.

4.4.1. Possibility to choose the modules the user likes best

4.4.1.1. General

Firstly, a pronounced remark about the content of the application revolved around the client's needs. Every person goes through the grieving process differently (see also, 4.5. What is grief), and every person has different preferences when it comes to processing their grief. For these reasons, it was noted as important to offer many options in the application, so that every person could find something that would match their needs. Moreover, users of the tool should have the option to choose individual modules, instead of having to follow a predefined path. As one of the participants said: " [what would be most valuable, is] *that they can choose. And that each*

Table 1 All discussed features of a digital application for bereavement support, categorized by the need of the user.

Category	Feature	Benefits	Risks	Possible solution	Other considerations	Content ideas
Possibility to choose the modules the user likes best	*General*	-	The app might have modules that are not suitable for some users, as every person has different needs.	Make every module or feature optional.	-	-
Clear idea about the working of the application	*General*	-	The possibility that the app will be used by individuals who have a more complicated form of grief, where they think the app should have fixed all their problems. When it does not, their problems will worsen.	Very large screening at the start of the program. Dependent on expectations of user, so maybe be very clear about the target group of the application, and how it should be used.	-	-
Explanation, normalize feelings	*(Interactive) psycho-education*	It can be a very valuable module for almost everyone, or should even be a necessary feature. The aspect of interactivity and providing visual information makes the tool more accessible for young adolescents and individuals of lower social class.	The app might explain the grieving process in a way that is not recognizable for the user, since there are so many ways to grief.	Start the program with help of therapist or GP etc., that will find the modules that are the right fit for you. Emphasize how every person has a unique grieving process, explain risks of wrong use of application. Depression, grief severity questionnaire, findings can suggest best fitting module	-	Possible content ideas of this module were the following: • Explanation about what is grief, and how your feelings and behavior are normal • Focus on how to handle your feelings and emotions • How to care for yourself • Emphasize the importance of peer interaction
	Listen to experience of fellow sufferers	You can learn from the experience of others. It can help to normalize and recognize feelings	Users might experience hearing the story from someone else burdensome.	Make it an optional feature, as some people might also find it helpful.	A lot of people might prefer listening to stories or a podcast over reading written text, or going to a physical group therapy.	-
	How to support bereaved individuals when close to them	People close to bereaved individual will learn how to support them.	-	-	-	-

Way to express emotions, vent feelings and thoughts	Interactive question game (possibly with creative exercises)	It is a good way of processing grief, it provides more meaning to loss. It can be used in family losses, or during group therapy. It promotes interactivity, and reduces loneliness. • Open communication is very important • Can give guidance when it's hard to talk about feelings It can change the topic of conversation, since you will talk about a wide range of things. Adding creative questions besides the normal question will let the user look at things from another perspective. They will make use his body in their grieving, which will promote the processing. (P6) Not all people will find this useful however.	When there is no room to freely express emotions within a household, this game could lead to tensions or negative feelings.	In the app, it should be screened whether the family is safe to play this game, and information should be provided about the risks.	It can be set up in a way that it will be possible to play offline (with a physically present group of people), but also offline (have conversations about the questions in the app itself). It is suited for a therapeutic setting, but it will not motivate people to talk when they do not do this within their household, without the app.	-
	Individual questions (possibly with creative exercises)	It is good way to express your feelings It is useful when it is yet too hard for the user to talk about their feelings to others.	Certain questions about the deceased might spark an intense sadness or worrying, causing someone to get stuck in those feelings.	Give examples: how did other people answer this question (in a positive way)?. Prompt people to look at situations or answers from multiple perspectives.	-
	Diary	Free room to express is always valuable It is easily accessible, people can want to express their feelings at every moment, because of some trigger. People can get better insight in their feelings.	When there is only free space to vent your feelings, people might get stuck in a negative spiral of emotions and thoughts.	People should be able to express their emotions in a structured way, according to certain questions about their behaviour and thoughts (using a diary form).	It is a useful feature for people who have digital writing preference over analogue writing. When overseen by a therapist, the therapist gets more insight into the process of the user, and can help the user understand themselves as well.	Can be free space, or guided by questions to help the user express their emotions. The last option also prevents getting stuck in a negative spiral of feelings.

Emotion and behavioural regulation techniques	*Chat with (professional) volunteers*	A chat is very low-threshold. It is useful for the user to be able to their feelings in an anonymous way.	-		-	-
	Chatbot	It has a resemblance with therapist or peer, but it is completely anonymous. It can serve as listening ear, offer support. Chatbots are currently really good. It might work for certain people.	-	There is a risk of messages being interpreted in the wrong way, when you only make use of written text.	-	The technology for this is not yet advanced enough. A chatbot misses the empathic part. Chatbots cannot see non-verbal signs, which are necessary to offer the best support. It might work, but only for normal grief. It might have different effect when people know that they are talking to a chatbot.
	Cognitive behavioral therapy program	Such a program can help people to better understand themselves. There is a possibility to combine face-to-face sessions with therapists with self-help sessions. It is low-threshold, as you can do it in your own way, in your own environment.	-	-	-	There is an added benefit when there is the possibility of supervision from a health provider. Without this, users may abandon the program before it is finished, or not even start. Users have different needs and preferences when it comes to guidance. There are many people who will be fine doing such a program on their own. Some people however, might feel alone in their grief, or need to have the extra guidance (e.g. low social class). With therapist supervision, the therapist needs to have sufficient technical skills. There should be an evaluation or quiz at the start to personalize the program, to match the user's needs. When there is a communication possibility with therapist via chat, the therapist needs to know how to communicate with a client properly, using written text. It is not enough to only focus on cognition, since a large part of grief is in the body.

Additional column (Cognitive behavioral therapy program):

Focus on elements of a healthy lifestyle.
- Support physical movement.
- Avoiding feelings through food, alcohol, drugs.
- Sleep rhythm.

Follow depression protocol.

Let users find joy in living again.

	Mindfulness	Blocking your emotions is a large part of grief. Mindfulness is a very good means to stop avoiding your feelings, and start to actively process them. The user's feelings will be easier to bear when they practice focusing on them more often. Mindfulness can increase feelings of safety. It is very good to involve the body, the autonomic nervous system in the grieving processing, as this is where a large part of the grief resides. Works for many people.	When this is used too early, there is a chance that people get overwhelmed by the sensations in their body, sparking feelings of unsafety and fear. Individuals might misinterpret this tool as a means to relax and think positively, causing them to stow away their feelings and move on.	Make it possible for users to easily find extra help when they notice those feelings of unease, and explain this in the application as well. Let users decide for themselves when they think they are ready. Make the aim of the mindfulness sessions very clear, which would be to learn to recognize and accept your feelings and thoughts.	It can work for everyone, but you have to be open for it, not everyone is.	Focus on the allowance of all emotions. Focus on relaxation. It should promote awareness of your thoughts and body. The module should have no goal, so also no relaxation goal, only being aware. Focus on the present.
	Emotional Freedom Techniques	It can help people regulate and process their emotions.	-	-	-	There needs to be a clear video of live session with therapist, explaining the technique, before someone can start to try it themselves.
Social support	*Chat function / talk to peers*	It can reduce loneliness. It is good when there is room to share your own story. Users can learn from others Users can get support from others.	When users have peer contact with people who have experiences different losses, this might not be beneficial for both individuals. There might be people in a chat group who will say mean things, or have the intention to bother others. There is a risk of messages being interpreted in the wrong way, when you only make use of written text.	Separate those people in the application. There needs to be some kind of control for this, that people can report this. Users can just leave the group when they are bothered by others. Replace the chat feature with an option to video call peers.	-	-

Requirement	Feature	Pros	Cons	Solution / supervision	Additional notes
			Users might end up in a negative spiral, where the communication features is only used to talk to each other about their worst feelings and situations	Place supervision of a therapist or professional in 'chat rooms'.	Depression or grief severity questionnaire: The outcome of such a questionnaire can give people understanding about their situation, so that they can also think for themselves if they need extra help.
Awareness for outside help	*External resources page*	It can be combined with psycho-education about when they might seek more help. In the end, support the grieving process can best be done by people.	-	-	
Allow room for open grieving process, memories of user	*Place to share or keep memories of objects, events or people in text, photos, videos or sound*	It is always accessible, which is harder with analogue photobook. There is an added benefit of video and sound input. It is easier to manage than the physical form. The module can be made into a creative collage activity, for the whole family or individually. Visualizing is very meaningful. It promotes an open grieving process, something that is yours to look at.	-		It is extra useful when there is an option to share. There needs to be a secure environment for data storage. Useful for digitally inclined people, but some people might prefer a physical object or photobook, which is more tangible.

module gets a short introductory video or something, and that they can choose. I think that's the most… yes, that's perhaps the most valuable.".

4.4.2. Clear idea about the working of the application

4.4.2.1. General

Multiple times, participants noted their concern about a possible risk for users with more severe grief-related symptoms. When they are using the application, they might think it would no longer be necessary for them to seek further help. For this reason, the application should clearly state the target group, and how the application should be used. Alternatively, it was suggested that some kind of screening tool be included into the intervention. This way, users that would need extra support can be made aware of this or can be directly referred to professional human support.

> *"Yes, that would be nice, that you, for example… that it also contains, for example, that every so often a grief questionnaire or maybe the BDI, the Beck Depression Inventory, that those are in it or something, so that someone… can find additional help themselves..*"

4.4.3. Explanation, normalize feelings

4.4.3.1. (Interactive) psychoeducation

A psychoeducational module about grief was generally deemed as a very valuable addition to the tool. Some health providers even stated how this is useful for everyone who has experienced some kind of loss. Furthermore, as providing clear information about the subject is important, two participants explicitly said it was a necessary feature.

The grief counsellor however, said there might be a risk in the fact that every user would have a completely different grief experience. Consequently, some users might not recognize themselves in the described phenomena, which could make their problems worse. As a precaution therefore, the participant suggested that the use of the tool could be preceded by a session with a therapist or general practitioner. These professionals would be able to make a clear diagnosis and refer the client to the most suited features of the tool. Other suggested solutions were clearly stating in the tool itself how every person has a unique grief experience, or using some kind of screening procedure based on which the best suited application features would be presented to the user. The last two solutions are likely less reliable, but more cost-effective and low-threshold.

One participant spoke about the advantage of presenting the module in an interactive way, using a combination of videos, text and quizzes. It would not only be more accessible in general, but this way it might additionally be a useful tool for children, young adolescents, or users from a lower social class: "(…) *a lot of people are visual thinkers, so if you're going to work with images and things like that, I think that's very powerful."*

Proposed content of the tool included, among others, an explanation about what is grief, and an assurance about how one's feelings and behaviours are normal. Secondly, there should be an explanation about possible ways for users to handle their feelings and emotions. Other aspects that were mentioned were how to care for yourself, and how important it is to interact with others during the grieving process.

4.4.3.2. Listen to experiences of fellow sufferers

Another discussed feature was the possibility to listen or read the stories of other people with similar experiences. This feature was indicated to likely help some people, as they can learn from the experiences of others, or normalize their own feelings. However, some individuals might experience this to be an additional burden on top of their own. For this reason, the feature should indicate optional usage.

In indication for the way of presenting the information was discussed by one participant. After the interviewer mentioned several examples for the information to be presented, she expressed her opinion about podcasts:

> *"A Podcast, that's totally hip of course. And trendy *laughs*, yes. And a lot of people find that much more pleasant than reading lots of texts, or going to such a meeting, (…)."*

4.4.3.3. How to support bereaved individuals when close to them

When asked for additional content ideas, one participant mentioned that the tool might also be useful for people who are close to someone experiencing grief. When they can learn how provide grief support in a meaningful way, this might benefit both parties.

4.4.4. Way to express emotions, vent feelings and thoughts

4.4.4.1. Interactive question game (possibly with creative exercises)

An interactive question game was a feature that was proposed by the interviewer, based on the physical game called All the Stars Above (Neimeyer, 2012). As this is an multiplayer game, it can be played within a household or with a group of friends. To play the game, users can let the tool generate grief-related questions for them, within a certain category (e.g. emotions or memories). These questions could then be answered by one of the player, or discussed by the whole group.

Reaction on the explanation of this game were varying, but mostly positive. An important benefit that was mentioned touched on the element of interactivity, as it is important for bereaved individuals to remain in contact with others.

> *"I think any… any way, whether it's a game, but a game makes it more fun - as long as it promotes interaction because - because I think that's a big risk in grieving, that you are grieving on your own."*

Participants also noted the additional benefit that individuals struggling with this could use the game as a low-threshold conversation starter. Moreover, people who have already talked about their loss with other get an opportunity to talk about different things, or look at things from another perspective. Taken together, the game might be deemed useful in supporting users in their grieving process, and providing more meaning to their grief. One participant also mentioned how more interactivity will lead to reduced loneliness.

Besides being used within a physical group of people, it was noted that the game could be used to play this with friends or family in a remote setting as well. The game was thought to be most valuable for family losses, but it was also suggested to be helpful in group therapy. The psychologist who mentioned this however, thought that the tool was only suited to be player under guidance, as she thought that no one who needed the interaction would make use of the game by themselves.

> *"If people have to do that themselves at home, and you're not there, and they aren't much of a talker anyway, so to speak, because what you really want is for them to talk to each other. Then I think, I think the threshold is too high to do that by themselves. And.. people who are going to do it, they are probably already talking to each other anyway."*

Lastly, one participant expressed their concern about the possible risk of playing the game within an unsafe family. She said that it could happen that certain households do not allow enough room for anyone to express their feelings. This could lead to tensions or negative feelings while playing the game. This concern matches the one of Daisy Luiten, the creator of All the Stars above. It was mentioned that this was the reason why that game was meant to be played only in therapeutic setting . The participant mentioned, however, that the risks could be overcome with a screening process to determine whether it was safe for a family to use the feature. Additionally, information should be provided about the possible risks.

4.4.4.2. Individual questions (possibly with creative exercises)

The above-described game could also be formed into an environment were users can play 'single-player': instead of discussing the questions with others, they answer them for themselves, in written form. This idea was generally

received positively. Participants thought that this was a good way for users to express their feelings, especially when they are not yet ready to share them with others. One health provider, however, had some concerns about the game causing a negative spiral of worrying:

> "(…) *suppose that the question is 'how was your holiday with eh… your last holiday with your husband?' And that questions are asked about that… then you have the chance that it just keeps going in a circle, I think. That – that they… that, as it were, there would be the risk of causing someone to worry.*"

He provides multiple solutions to avoid this risk, both linked to help users see the situation from another perspective. This might help the user to break loose from their spiral of negative thoughts and emotions. Firstly, the questions might come with examples of how others answered the question, in a positive way. Secondly, the questions might be accompanied with statements that will prompt users to look at the questions or their answers from another perspective.

4.4.4.3. Diary

This feature was described as free space within the application to write down any thoughts or events that might occur to the user. Several participant indicated the value of free room to express ones feelings, as users can gain more insight in their own feelings and behaviour. In addition, an application is always accessible. This is especially useful as thoughts or situations can trigger certain memories or emotions at any moment. I was also mentioned multiple times however, that not every individual has a preference for digital writing over the use of a physical diary.

Another benefit might be the fact that therapists can use this data as an input for their therapy sessions. When the client can explain their doing with the help of the dairy, a therapist can get more insight into the process of the user, and can help the user understand themselves better.

One psychologist shared an idea about an online dairy form. An analogue version of this form is handed to clients as a means for them to get more insight the thoughts that cause certain behaviour. He described how this form could be a good alternative, as it is more accessible.

> "(…) *but so that someone, eh, because I'm giving them papers now, but if that, as soon as they get a bad feeling that they can just type in or record their voice, this I feel, that thing, this is the event, this is my thought. So I think that's a really good app and if someone is adept at that, to get more insight into their thoughts, and feelings, then the next step could be to challenge them. Or examine them.*"

Structuring the feature with guiding questions can also prevent the user from getting stuck in a spiral of negative thoughts. By including questions that will challenge the user to think about the cause and credibility of their dysfunctional thoughts, it might keep the them getting stuck those negative thoughts.

4.4.4.4. Chat with (professional) volunteers

This feature was suggested by one participant, based on the possibility for individuals to start an anonymous chat with a helper at 113 Suicide prevention (*Suicide prevention Netherlands | 113 Zelfmoordpreventie*, n.d.). She indicated that many can benefit greatly from the possibility to express their feelings to someone in an anonymous and non-judgmental setting.

4.4.4.5. Chatbot

Discussing the possibility of implementing a chatbot in a grief support application was for all participants a novel phenomenon. A few participants did not think this a good idea, as they thought that present technology is not yet advanced enough for a chatbot to resemble a human. Related concerns included the notion that chatbots lack an empathic part, or that they cannot make use of non-verbal communication signs. This might also cause a risk for users, as they might interpret response in the wrong way. No suggestions were given about ways to reduce this risk.

Other responses were more positive. It was mentioned how a chatbot is a good alternative for a therapist or a peer, as it can resemble both in an anonymous way. It can serve as a (metaphorical) listening ear, and offer support to the user. Moreover, it was noted that currently available chatbots "(…) *are very good these days, I think.".* These participants also included the sidenote however, that a chatbot might not be suited for everyone, and should probably only focus on normal grief. Lastly, the effectiveness of the offered support might be influenced by whether users are aware that they are communicating with a chatbot. This last statement might be interesting to further examine.

4.4.5. Emotion and behavioural regulation techniques

4.4.5.1. Cognitive behavioural therapy program

The implementation of a cognitive behavioural program was generally received at a positive addition to the tool, as none of the health providers identified any accompanying risks. One noted benefit was that such a program could help users to understand themselves better. It was also said that including such a module into an application provides users with a low-threshold way to go through such a program on their own pace, in their own environment, making it a very low-threshold alternative to face-to-face session with a therapist. Another participant however, thought that such a program could be combined nicely with their therapy sessions, enabling the user to continue the sessions at home.

Health providers also gave their opinion about the possibility of the module being supervised by a therapist or practice nurse in an online setting. Most participants noticed that the tool could be used without intervention of a professional, but occasional online contact with a supervisor might increase efficacy. One psychologist, however, was quite sceptical about the usage of the tool without any supervision. She mentioned that users might not finish the program, or start in the first place.

> *"(…) it demands a lot from people's self-motivation, or from, yes, motivation or curiosity. And that... may well be helpful for some people, but... yeah. People don't do that anyway. I don't think people are that quick to do that. If you have lost a loved one, and then you are going to work through such a program on your own. I don't think that will happen that quickly."*

Another health provider, however, mentioned how every individual has difference needs and preferences when it comes to guidance. Many user will be fine by going through the indicated program on their own. Some people however, might feel alone in their grief, or need to have the extra guidance. These people are for example members of a lower social class, or younger people.

One health provider also pointed out additional considerations with regard to providing digital guidance. Firstly, the tool can only by guided by therapists with sufficient digital skills. Secondly, digital supervision requires the therapist to know how to properly communicate to the client via written text.

Lastly, a few suggestions were made related to the content of the module. Firstly, several health providers mentioned that is was a good idea to let the module start with some kind of evaluation, which would include an identification of the reaction of the user on their loss. After this, the application is then able to offer what the user needs. As one participant noted: "*I think that definitely makes sense.".*

Another suggestion for the content was to follow the protocol of depression, to try to let users find joy in living again. The last suggestion was based on the bodily awareness. The psychosocial therapist noted that the program focused too much on the cognitive part, neglecting the needs of the body. She thought that physical movement was a crucial part of grief, not only in exercising, but also in the area of allowing feelings and emotions to be there.

> *"Yes. lifestyle. To move. That people are going to move. Go walk, go... Something with that - go do something. Yes, it's very important, also to get the body going, because that also releases positive hormones… which makes people feel better."*

> *" (…) in my view, you can prevent complex or stagnant mourning, you can prevent that there is and will remain variation and that a person remains physically and mentally in motion, because then a grieving process can take its natural course, and at the moment that it – that natural .. that natural movement is no longer there, then there may be stagnant mourning."*

4.4.5.2. Mindfulness

The above quote about involving the body, also connects to the idea of mindfulness. The same participant describes how mindfulness is very important, as it is very good to involve the body in the grieving process. This is where a large part of the grief resides, as the autonomic nervous system can cause a large physical stress reaction after the event of loss. It was noted by several other health providers as well that mindfulness is a useful means for users to stop avoiding their feelings, and instead start to actively process them. Other things that were said were that mindfulness can increase feelings of safety, and make the user's feelings easier to bear. Furthermore, mindfulness can work for a great amount of people, the only requisite being that individuals have to be open for it.

In spite of all advantages, one risk was explained as well. When users try to use mindfulness to early in their grieving process, there is a chance that they might get overwhelmed by all sensations in their body, they suddenly become aware off. This might lead to feelings of unsafety and fear, worsening the grief-related symptoms. To prevent this, it is important to inform users of this phenomenon, and the let users decide for themselves when they think they are ready. Furthermore, it should be possible for them to find additional help when they notice those feelings of unease.

Lastly, some contradiction came forward regarding the focus or content of the mindfulness feature. It was mentioned multiple times how the feature should promote users to focus on the present, and on the awareness and allowance of all thoughts and emotions, and all feelings in the body. However, while one psychologist mentioned that mindfulness was a good means to relax, another emphasized how mindfulness should never have a goal. He said that having the goal of relaxation would suggest that the tool was there to make the user feel better, while instead the goal was the make the user *feel* better:

> *" (…) because mindfulness has – has nothing… Nah, a bit bluntly said, but it has nothing to do with positive thoughts. Mindfulness is also mindfully.. experiencing the shit. So also mindfully, for example, pain, both psychological and physical pain, to experience it - but then consciously, without judgment. And I think that's important, because there are still a lot of people who do mindfulness practice, but use it with the aim of feeling better*."

According to this participant, it was important to emphasize in the application how mindfulness is meant to become aware of one's feelings, not to reach the goal of feeling better.

4.4.5.3. Emotional Freedom Techniques

This feature of emotional freedom techniques has been added as it was suggested by one of the participants. She noted that this technique is currently not scientifically proven, but it is a very promising method, also for support in grief process. This is because it can help individuals to regulate and process their emotions. Because of this potential, it might be an interesting feature to include in follow-up studies.

4.4.6. Social support

4.4.6.1. Chat function / talk to peers

Another feature option for the digital intervention was to include the possibility to chat with other users, who are going through a similar experience. Participants said about this, that it is always beneficial to provide room for sharing you own story. Additionally, it might reduce loneliness, as users can get support from each other. Furthermore, users can learn from each other's experiences.

In spite of these benefits, the chat function was one of the features which has received the most concerns. First of all, it might be disadvantageous for users to chat with individuals who have experienced a different kind of loss. Therefore, chats should be sorted based on kind of experience.

Besides this, it might happen that users will misuse the chats, in a way that will bother or hurt others. For this reason, it might be useful to build in a method for users to easily report those people. Another solution for this would be to only allow communication under therapeutic supervision. According to the psychologist who suggested this, however, it might not be needed, as "*of course you can always .. if you notice, this is not my chat box, then you don't come anymore, so, it's very low-threshold I think.*".

Another participant thought that supervision might be needed because of a different reason: users might not always positively influence each other. When users get stuck in their sorrow together, they might land in a negative spiral.

> "*There is a risk if you don't see to it, that sometimes it can also backfire, that people get sucked into something that is very difficult for them to get out of, so that's, yes that's a bit tricky, I think.*"

Additionally, their might be a risk related to its reliance on written text. This is because text messages can quite easily be interpreted in the wrong way. The participant who noted this, said that he therefore thought a chat function should not be implemented. A good replacement would be to make use of the option to video call peers.

Overall, it seems that a lot of risks are related to the implementation of a written chat function without supervision. It does not become clear from the data whether the benefits of a supervised chat function of video call function will outweigh their cost.

4.4.7. Awareness for outside help

4.4.7.1. External resources page

A module in which user can find more information about external resources, was not included in the interview questions. However, this feature was mentioned multiple times a useful or even necessary addition to the tool. As the grief counsellor noted, "(…) *in the end dealing with grief and loss is... can best be done by humans.*". Example of these external resources are therapists or grief counsellor who can provide more help, or offline groups for grief therapy. Other suggestions where to include a message about when it is good to seek further help, or to link it to the result of some grief severity evaluation.

4.4.8. Allow room for open grieving process, memories of user

4.4.8.1. Place to share or keep memories of objects, events or people in text, photos, videos or sound

The last discussed module was indicated as a digital 'memory box'. This module could be used as a place for users to upload photos of those they have lost, along with photos of items related to that person. In this way, they might create a place for their memories.

The above description was generally received positively by users. It was indicated by one participant how visualizing is very meaningful for grief processing. Furthermore, it was said to promote an open grieving process, by having something that is yours to look at.

A noted benefit when compared to an analogue photobook was that it is always accessible and easy to manage. Additionally, an advantage of digital data storage is the possibility to include videos or sound fragments. Moreover, online storage also provides the option to easily share content with others. One health provider also described how this would allow for interaction, when a family could for instance create an online collage together. Even so, one participant was not particularly enthusiastic about the idea of an online memory box, as she thought that a considerable amount of people would still prefer the more tangible physical objects or photos.

One last consideration came from a health provider who commented that this should all exist within a secure environment for data storage.

4.5. What is grief

Participants were also asked the share what they thought was grief. Many different views on this subject were provided, some of them containing a clear indication for some aspect of the application.

4.5.1. Manifestations of grief

Every participant shared tried to define grief in a proper way, resulting in the information below. This section might give some implications about how to describe grief within the application, or what target group would be most suited to use the intervention.

Firstly, all participants described grief as a mental and physical reaction of an individual after a loss. One participants specified this into a relatively short period of heightened stress, mood swings or feelings of fear, as the results of a highly impactful situation to which needs to be adjusted.

Another reoccurring element in the description of grief relates to the broader element of loss. As mentioned earlier, it was noted by all participants that grief does not only occur after the death of a person, but it can manifest itself in many areas of life. One health provider described grief as a misconnection that can happen on different layers of one's existence, with a potential negative impact on many aspects of life.

> *"If you look at grief, you can see it as, there's something wrong in the connection with – or with yourself, or, within the family, or within the environment, or, just with one's existence, as in, what have I still to do here, on earth, the meaning."*

Grief can manifest itself after an event takes place which goes against an individual's hopes or expectations. This can have an impact on someone's idea of identity, meaning that a part of grief is redefining and rebalancing yourself and your life. Examples are having to build an identity of yourself without partner, without job or with a chronological illness. The same participant mentioned the following:

> "*Actually.. I have come to the conclusion in the years that I have worked now, that actually all people who experience complaints, that it always has to do with a loss. Whether it is something very ... real, but also for hopes, expectations. And, yes, that does something to you. To your identity. So in the end it's also about rebalancing who you are.*"

4.5.2 Phases of grief

During the interviews, divergent views were provided on the topic of phases within the grieving process. The section below might give some implications about how to structure the app so that it will most suit the needs of individuals at a particular point in time. It might also give direction to a personalized element in the application, that might indicate in which phase the user currently is.

Firstly, one health provider recalled the famous phases of grief, by Kübler-Ross (1969). She said how nowadays it was clear that the process of grief did not exist of these consecutive stages. Nonetheless, the grieving process did consist of two alternating stages of grieving and moments of normal functioning. If this is indeed the case, it could be included into the application as part of the psycho-educational module.

Secondly, the two health providers which were specialized in grief both thought the grieving process to consist of several stages. One of them made use of the process of integral grief processing, which distinguishes the following grieving stages: *acknowledgement*, *processing* or integration, and *continuation* or the attachment of meaning. The second health provider described four different stages, also starting with *acknowledgement* of the grief. The subsequent stages are *recognition* and understanding of their feelings, the *exploration* of the tools to reconnect, and the *connection* or integration stage. As can be seen, both descriptions are largely overlapping, and might be

combined into one stage theory of grief. Even when these stages are not followed in a particular order, the idea might help users to better understand themselves.

4.6. Normal grief treatment

4.6.1. Needs of the client

Several participants noted how supporting someone in their grieving process should based on the needs and preferences of the client, together with where they find themselves in their grieving process. This shows that there is no one way to help a grieving individual, which is important to keep in mind with the development of an application for normal grief.

Multiple participants noted that they always started their sessions with explaining what is grief, and telling more about their procedure. Secondly, it was important to look at where the clients finds themselves in the grieving process at this moment. Doing this together with the client will help them to recognize and understand their feelings, and it is a first step in acknowledging one's loss. Furthermore, understanding where the client is in their grieving process facilitates the health' providers choice for the right treatment procedure.

When asked what grieving individual need most, this resulted in a range of answers from the health providers. Most often, they thought that those people mostly need a listening ear, and space to talk about their feelings. Other things that were mentioned are room to deal with their grief in their own way, and explanation about how their grief is normal.

4.6.2. Task of the health provider

The participants described different tasks of a health provider of supporting a grieving client, based on their needs. The aspect that was noted by all participants, was to listen to their client, and give them room to talk about their experience. Secondly, every participant also said that it was good to normalize the grieving situation of the client. One health provider used a genogram for this: they would fill it in together with their client, to both get a better idea about how this grief resided in the family:

> *"By doing this together with – with a client, you actually already gain insight into which person is important to this person, but you can also reveal underlying dynamics very well, patterns that are already becoming visible. I see that that is so helpful for clients to see, oh but wait a minute, how I react is not just my own, that's how we all do it, within our family, (…)"*

Another task that was mentioned was to help letting the client find their daily rhythm again. One participant did this by planning in dedicated moments of the day in which clients should allow all their feelings to be there and actively grief. Another health providers said that she tries to think along with the participants about how to best start integrating normal daily activities back into your life.

> *"(…) to what extent should she have time to… to process that loss… yes, let's say, or… should she, should she perhaps be a bit stricter with herself [participant laughs a little] and then try anyway, well, and we're actually mainly talking about those kinds of things..., too. And then, yes also the – getting back to normal social life."*

Lastly, another task of health provider can be overseeing the severity of the grief, and finding out whether there are obstacles in the way of a normal grieving process.

All above-mentioned tasks have the potential to be implemented into an application as well. The best way to execute this is will be open for further research.

4.6.2. Challenging aspects of normal grief treatment

4.6.2.1. It is unsolvable

One therapist described a challenge in supporting a grieving individual as the fact that a loss is unsolvable. In the case of normal grief, it can be burdensome for a therapist, as they cannot 'cure' this, but only give the client room to tell their (often very sad) story. An application can provide a solution for this, when it allows users a way to express their feelings and when it can offer support to those who need it, without interference of a therapist.

4.6.2.2. Exploring and expression one's feelings

A large challenge for the grieving individual who is going through a grieving process, is finding all your feelings to be present and to be okay. Society has us programmed to just move on as quickly as possible, it is not culturally accepted to show your feelings and be vulnerable. This however, is the first step in processing the burden, and learn to carry it.

4.6.2.3. Attaching meaning to loss

Another participant described how he worked according to the method of integral grief processing. This method indicates three possible stages of grief: acknowledgement, processing or integration, and continuing. This last stage is related to attaching a greater meaning to the loss, which, according to the participant, is the most challenging stage to reach and complete.

The three challenges as provided above, might give direction as to what content or information of a normal grief application should get more weight.

4.7. Grief treatment is not reimbursed

Lastly, participants were asked to state their opinion about the fact that grief treatment is no longer reimbursed as standard by health insurers in the Netherlands. As most health providers thought this to be far from positive, it might emphasize the need for alternative grief treatment.

In general, all psychologists mentioned that people do not or rarely approach them for mental or physical complaints directly related to grief. One participant added to this, that when it does happen that a client has complicated grief, psychologists just diagnose it under another mental illness.

One psychologist looked at the positive side of the current regulation. She noted that, when grief follows a normal process, it will disappear without the need for professional treatment. Secondly, she thought that people will not seek help more often when it is free.

> "*Perhaps it is more that people with stagnated grief, who find it very difficult to do something with it and talk about it, I think they don't go to the general practitioner so quickly either*."

Lastly, she mentioned that individuals with complicated grief typically match other diagnoses as well. It will then still be possible for them to follow a treatment that is reimbursed.

Several reasons why grief treatment should be fully reimbursed are the following. Firstly, there are many individuals who are held back from seeking help when it costs money. Consequently, this might lead to a decrease in well-being. For instance, their grief can cause accidents when they have critical jobs. Furthermore, when individuals are not allowed enough room for grieving, it might lead to more severe mental health issues. This will in turn also be more costly in the long term.

> "(…) *it is of course too idiotic.. if it is actually very healthy for people to seek help, and that you do so in time, before the problems are very large, and therefore also much more expensive, for healthcare in the Netherlands. So I find it indescribable, so.. yes, I think my answer is clear, I think all therapists and practitioners think the same.*"

Lastly, it was remarked that grief is even more severe than depression, in multiple ways. This as well seems like a good reason to make grief treatment more accessible.

5. Discussion

By combining past research relating to grief or digital mental health interventions with in-depth interviews of mental health providers, this study aimed to form recommendations about the content and structure of a mobile-based mental health intervention for the support of normal grief. It was discussed how therapeutic supervision in digital interventions might increase adherence, but that general effectiveness can be just as high in self-help applications. In addition, several methods of increasing adherence in a self-help tools were described. The literature review also included a careful consideration of multiple content ideas in light of normal grief treatment support, specifically looking at their theory base and amount of human support. Several of these suggestions do already exist within publicly available implementations, though they might not focus on normal grief, or might be easily accessible for all bereaved individuals.

The qualitative analysis revealed several themes related to a mobile-based grief intervention. Mental health providers have expressed their opinion about such an application, targeting normal grief: many benefits and risks were described during in-depth interviews. In general, all health providers have mentioned that a digital tool for grief support will be helpful for at least some people. For which people and it what situation the tool might be useful, was highly dependent on the given feature or structure of the application. Additionally, the participants have enriched this investigation with a considerable amount of information on the topic of the target group, practical use and content of the tool. Lastly, additional topics of discussion were the definition of grief, the process of supporting their clients in a normal grieving process and their opinions about whether grief treatment should be reimbursed.

5.1 Recommendations

Based on the findings depicted above, it is expected that the practical design and implication of a mobile-based intervention, specifically designed for normal grief treatment, will have multiple benefits for western society. On a larger scale, a normal grief treatment application has the potential to decrease mental health costs, as the usage of the digital intervention might be able to increase ones well-being on the long term. Further examination of this theory is however needed to strengthen this expectation. Additionally, costs will be saved as many individuals will have access to a means of independent, or mostly independent, mental health promotion. This might prevent some individuals from developing more severe grief-related symptoms, subsequently turning into prolonged grief disorder. It is recommended, however, that the tool will implement some kind of screening protocol, that is able to provide users with more insight in their need for professional help. Alternatively, mental health nurses at general practices might benefit from using the intervention as an aiding tool in supporting individuals with mild grief-related symptoms. With this in mind, it is recommended to design the application in a way that is suited for both independent use and professional support. Therefore, the program should offer a possibility to communicate with the client in a secure environment. Furthermore, all features or modules of the tool should be separately available. This will allow the user to choose something that will fit their needs, as well as enable mental health providers to access and show different modules individually. As a side note, however, it might be beneficial to provide information *within* separate modules in chunks, to prevent users from becoming overwhelmed.

The results of the qualitative analysis has also suggested to extend the target group and area of application of the intervention, as the described structure and content might be beneficial for more individuals. Firstly, besides being useful for adults, the tool might be especially helpful for teenagers young adolescents. This group can benefit from a low-threshold and anonymous way of mental health promotion, that has implemented multiple interactive methods of engagement. The application called Apart of Me (*Apart of Me - Helping young people cope with grief*, n.d.) can serve as an inspiration for this design. Secondly, this study initially focused on support individuals who have experienced the death of a person. However, all health providers have mentioned that grief can be caused by

every form of loss. As it was also mentioned that an application might be beneficial for those people as well, it is recommended to design the intervention for all individuals who have experienced some kind of loss. Research on the topic of the support of different kinds of grief is however limited, so further research in this area might be essential. Based on the above explanation, it is recommended to clearly indicate the target group, both within the application and during its presentation, as this might reach more target group users and at the same time prevents misuse of the application.

Another aspect that has been noted regarding the target group, was the fact that the digital intervention might serve well as an aiding tool for therapists in the treatment of complicated grief. This is because both the treatment and prevention of complicated grief require some of the same means. This can be derived from the indications about the application content which will be best suited for the intervention. It is recommended that the content will include a broad range of different modules, all connected to a specific need or preference the user might have. Based on the results of this investigation, it seems that the aspect of psychoeducation about grief might be helpful to every user, and should therefore be an essential addition to the tool. Additionally, the feature of mindfulness has also been indicated to be beneficial for almost every user. This tool should however be introduced later in the process, to prevent the risk on worsening one's symptoms. Lastly, the platform of Minddistrict seems to feature many of the modules and functionalities that have been indicated to benefit bereaved individuals (*Explore our ehealth platform functionalities*, n.d.). For this reason, it might be useful to involve this platform into the designing process of a support tool for normal grief, although more tailored to independent use.

The design of the modules should be focused on different methods to promote adherence and attrition, subsequently increasing effectiveness. Moreover, all possible risks that could occur for the different modules should be taken into account. It is suggested that future studies investigate the impact of the noted risks, and examine whether they will be diminished with their proposed solution. Findings also suggest that some features are only safe to be implemented when supervision is available, for example the live chat. Further research is needed to determine whether the implementation of this supervised module will significantly increase effectiveness, outweighing the cost of implementation and maintenance.

5.2 Limitations and future work

Several limitations should be considered in light of the findings. First of all, all findings were based on the interviews of six participants. Although all participants worked as mental health providers, their field of work varied greatly. The fact that the sample was not homogeneous can be connected to their provided answers, as many different opinions on the same topic came forth. Additionally, the sample was recruited based on convenience and snowball sampling, all participants residing from the same region in the Netherlands. Those considerations indicate that these findings might not generalize to providers in different settings, as the health providers might not be representative of the related larger population. Should this investigation be repeated, it is recommended to extend the target group, or focus on a therapists or grief counsellors more specifically. Furthermore, additional questions can be added to the interview, targeting the identified risks of certain features, and the features that needed more substantiation (e.g. emotional freedom techniques, or a module for those close to the bereaved).

Secondly, human memory can be influenced by certain heuristics. Considering this, the opinions of the mental health providers about certain features of the tool could have been influenced by the availability heuristic: even though it was stated that the application was focused on people expressing non-complicated grief, as this was the group that they worked with the most, they might have expressed their thoughts about the intervention with their client group of complicated grievers in mind. This might have caused them to overestimate the risks, or underestimate to treatment effectiveness of the tool. Future investigation is needed in order further examine this. In addition, the investigated normal grief treatment tool was described to participants without the use of a prototype, screenshot or some other visual aid to clarify the concept. This might have caused participants to misinterpret certain parts of the explanations, decreasing the chance on reliable findings that could generalize to

the whole population of health providers. Biases are difficult to avoid, however, next time it might have been better not to first prime participants by asking about their own experience with grieving clients. The lack of a prototype was also hard to get around, as this was an initial exploration of the health provider's interest in such a tool. Future studies can however use the result depicted here to develop some kind of prototype model.

As this study touched upon a wide variety of aspects related to a mobile-based application for grief support, it holds the potential of multiple topics for future investigation. First of all, the literature review that was provided in this report was no complete overview of all available data regarding digital mental health promotion interventions. Furthermore, only three existing implementations were mentioned, as a means to describe the suggested application content. In the future, this research can be further extended, and possibly linked to the findings of this qualitative investigation.

Additionally, in order to continue this research, one might focus on one of the following topics for further investigation. Firstly, it should be examined what would be the best techniques for the optimization of adherence to the tool. Specifically, one might look further into the use of reminders or push messages to increase engagement. Secondly, it should be investigated how a digital application can best replace the role of the health provider within an application. Lastly, the effectiveness of all proposed modules can be examined, and how those modules can best be implemented.

This study has only recruited mental health providers, to gain more insight into their interest and recommendations for a digital bereavement support intervention. In future research, members of the suggested target groups might be approached, in order to learn about their interest, needs and preferences for the above application. It is also suggested to create a prototype of the intervention, based on the findings in this study. This prototype should be designed with the thought of minimizing risks and costs, while maximizing accessibility, autonomy, and effectiveness. The resulting application could then potentially be used in research about the actual effects of the existence of such an app on the well-being of individuals. Another recommendation would be to extend the research to beyond the western culture, as grieving is a universal phenomenon.

5.3 Conclusion

Access to a widely digital tool for the support in a normal grieving process can be a valuable acquisition for many grieving individuals, dealing with any form of loss. The tool will be suited for independent use, however, might increase in effectiveness with partial therapeutic supervision. In addition, it is advised to include some kind of mechanism that can inform users whether they might need to seek additional support. Other possible areas of application include supporting a general practice nurse for moderate grief symptom treatment, or a therapist in the case complicated grief. As grieving is a culturally underestimated phenomenon, with non-reimbursed treatment in the Netherlands, will a widely accessible grief support tool a valuable addition for individuals to promote and maintain mental and physical well-being.

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