The GezelschApp
A Dutch Mobile Application to Reduce Social Isolation and Loneliness

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Abstract: The social isolation among older adults is a growing concern, as both social isolation and loneliness have been associated with ill health. Information communication technology can overcome the social and spatial barriers of social interaction by enabling easy affordable communication and activities of multiple form between older adults and others anytime and anywhere. Therefore, technology-supported intervention, such as the GezelschApp could prevent and ameliorate social isolation and loneliness among older adults. The aim of this paper is to introduce this new technology, to provide an overview of the current evaluation and to present the intermediate results concerning the usability of end-user acceptance of this technology. The GezelschApp is a mobile application to reduce social isolation and loneliness among older adults. This application, also accessible by PC and tablet, gives older adults access to a homepage with six features (an inbox for messages, news, activities, information, tips and friends). On beforehand interested older adults are screened by a coach before they receive a personal access code. During the 3 months evaluation of the GezelschApp the usability, end-user acceptance, level of experienced loneliness and quality of life are assessed. Although the evaluation of the GezelschApp is still running, the first focus groups (n=10) with users highlight the need of the current application to make new friends in a save manner and to participate in social activities.

1 INTRODUCTION

As demographic ageing is a global trend, the social isolation among older adults is a growing concern. Compared to the general population the prevalence of social isolation among older adults (60 years and older) is high. Often loneliness is referred as a problem specifically for older adults. This is partial supported by literature as loneliness is common only among the very old, that is, those aged 80 and over. (Dykstra, 2009). It is important to draw the distinction between social isolation and loneliness (de Jong Gierveld et al., 2006). Social isolation can be defined as an objective lack of interactions with others or the wider community and loneliness can be defined as the subjective feeling of the absence of a social network or a companion.

Both social isolation and loneliness have been associated with ill health. Following a recent review paper of Leigh-Hunt et al (Leigh-Hunt et al., 2017) there is a strong evidence that both social isolation and loneliness are associated with increase all-cause mortality and social isolation with cardiovascular disease and depression. However, determining causality is difficult as much of the research in this area involves observational studies. Concerning these association the prevention and amelioration of social isolation and loneliness of adults is becoming an important topic of policy-makers in various countries (Dickens et al., 2011).

There are various interventions to prevent and ameliorate social isolation and loneliness. Based on the purpose, mechanisms of action and intended outcomes these interventions can be categorized. Gardiner et al. (Gardiner et al., 2016) suggests the following six categories; social facilitation interventions, psycho-logical therapies, health and social care provision, animal interventions, befriending interventions and leisure/skill development. As well-conducted studies of the effectiveness of these social interventions for alleviating social isolation are rare, the evidence concerning these interventions are indistinctive. However, following the results of a review of Dickens

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et al (Dickens et al., 2011) it appears there are common characteristics of effective interventions. Effective interventions were those developed within the context of a theoretical basis and those offering social activity and/or support within a group format. Next to these two characteristics, interventions in which older adults are active participants also appeared more likely to be effective.

In the recent years, there has been an exponential growth in the use of information communication technology (ICT) in healthcare. These so called technology-supported health interventions are widely evaluated in various target groups (Ekeland et al., 2010, Kairy et al., 2009) and have the potential to increase the accessibility to care, to improve the quality of care and to lower health-care costs (DeChant et al., 1996). Various papers are published and addressed the effectiveness of technology-supported health interventions to reduce social isolation and loneliness in older adults (Chipps et al., 2017). ICT can overcome the social and spatial barriers of social interaction by enabling easy affordable communication and activities of multiple form between older adults and others anytime and anywhere (Chen and Schulz, 2016). Technology-supported health interventions to reduce social isolation and loneliness in older adults are divers and categorized into online activities, interpersonal, Internet-supported communi-cation and Internet-supported therapeutics. Older adults can benefit from technology-supported health interventions and will use them after proper training (Chen and Schulz, 2016). However, these interventions are not suitable for all older adults. Therefore, for a positive effect of these technology-supported health interventions in reducing social isolation and loneliness tailor-made interventions and training for the older adult is necessary.

In the Netherlands a new technology-supported health intervention to reduce social isolation and loneliness in older adults is developed and will be evaluated in the municipality of Enschede. The aim of this paper is to introduce this new technology, to provide an overview of the current evaluation and to present the intermediate results concerning the usability of end-user acceptance of this technology.

2 METHODS

This paper focusses on a technology supported health intervention to reduce social isolation and loneliness in older adults, named GezelschApp. A merge of the two Dutch words “Gezelschap” (the most suited

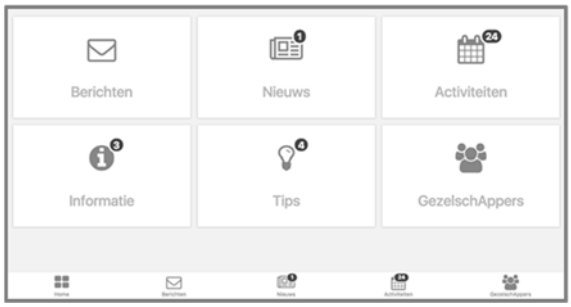

Figure 1: Homepage of the GezelschAPP.

English translation is “company”) and Applicatie (English translation is “application”). This mobile application, also accessible by PC and tablet, gives older adults access to a homepage with six features (Figure 1). The GezelschApp is developed by 8TING.

The six features of the GezelschApp are an inbox for messages, news, activities, information, tips and friends.

- Inbox (“Berichten”): In the inbox users receive messages concerning the current news, activities, information, tips and friend requests. With the inbox users also can send messages to their friends and their personal coach.
- News (“Nieuws”): This feature provides the latest news to the users concerning a healthy and active lifestyle.
- Activities (“Activiteiten”): The activities in the neighbourhood of the users are listed here. All activities in the municipality of Enschede are digitalized and available online, there are sport activities, social activities, education activities, cultural activities, wellbeing activities, culinary activities, and other activities suitable for older adults. Based on the interests of the user (profile information and user data) appropriated activities are presented.
- Information (“Informatie”): All kind of information concerning social activities, healthy and active aging and the use of the application is saved here.
- Tips (“Tips”): This feature provides tips to increase the number of social activities and social interactions.
- Friends (“GezelschAppers”): All users of the application are showcased here. The full contact details of a user are only visible for their friends and their coach. Users can become friends by sending and accepting friend requests. Friends can send each other messages and invite each other for activities.

Only screened older adults receive a personal access code (username and password). After older adults have shown interest in using the application, a face-to-face appointment is planned. During this appointment, a social worker of the local welfare and wellbeing organisation visits the older adults at home. After the social worker has made an estimation whether or not the interested older adult is a suitable user, the application is introduced to the older adult. Together the social worker and the older adult create an user account and profile information as a screen image, interests and hobbies are added to this account. During this introduction, the social worker sends a first friend request to the older adult. This request needs to be accepted by the older adult as this social worker will during the use of the application, coach the older adults to participate in activities and close (online) friendships.

The application gives the coach the opportunity based on the profile information and user data to send personal messages and tips focussing on social activities, healthy and active ageing and the use of the application to the users. These messages and tips can be sent to users personal or as batch to a group of users. Next to these messages and tips, coaches can activate users by sending them emails to their personal email account and text messages to their mobile phone. On behalf of the users, coaches can create new activities submitted by the users.

Next to the profile information, the application provides the coach intelligence on the user use of the application. In a clear overview, the coach can see whether a user sends friend request, accepts friend request or participates in activities. With this information, the coach can provide tailor-made coaching to the user with the aim to increase the use of the application and reduce social isolation and loneliness. This extra information of the user for coaches, forces the coach to change their way of working with social isolated older adults.

There are two main reasons for the developers to develop the GezelschApp and not use an existing application to reduce social isolation and loneliness in older adults, such as Facebook. First, to eliminate unwanted relationships arising such as preys on vulnerable and lonely older adults. Therefore, a secure and save (online) environment was requested. A non-public application was developed with imbedded an initial screening contact between the interested older adults and the social worker of the local welfare and wellbeing organisation. Second, to ensure the use of the GezelschApp and to help the users to participate in activities and close (online) friendships an active coach was requested. In existing applications, this role of a coach is not foreseen.

2.1 Participants

Users of the application are during the face-to-face appointment asked to voluntary participate in the study to assess the added value of this application for older adults. Older adults are included when they experience loneliness, are residents of the municipality of Enschede, have sufficient understanding of the Dutch language and are aged above 60 years. All participants give their informed consent prior to participation. Concerning sample size the aim of this cross-sectional cohort study is to include 75 older adults. The participants are asked to use the application at least three months.

2.2 Measurements

Considering the maturity of the technology and the aim of the technology the first evaluation of the GezelschApp focus on the endpoints: Usability, acceptance and possible working mechanisms (DeChant et al., 1996)(Jansen-Kosterink et al., 2016). During the 3 months evaluation of this application the usability, end-user acceptance, level of experienced loneliness and quality of life are assessed. Pre- and post-test participants are asked to complete questionnaires to assess the level of experienced loneliness and quality of life. The questionnaires concerning usability, end-user acceptance are only competed by the participants post-test.

2.2.1 Usability

The usability of the application is assessed with the System Usability Scale (Brooke, 1995). The SUS presented ten statements about the perceived usability of the application. Participants could indicate on a 0 to 4 scale to what extent the presented statements were true for them. To obtain the final SUS score, the sum of the participants' answers was multiplied by 2.5. The SUS score ranges from 0 to 100 (low and high usability, respectively). The English version of the SUS was translated into Dutch, as there was no validated Dutch version available.

2.2.2 End-user Acceptance

End-user acceptance of this application was assessed by means of a questionnaire with summated rating scales, based upon the Technology Acceptance Model (TAM) (Davis, 1989). TAM originates from the 1980s and has been used numerous times to assess and explain the acceptance of new technology. We

expanded TAM with factors that have been found to shape the user experience of mHealth technology: Enjoyment (Crutzen et al., 2011), aesthetics (Baumel and Muench, 2016), control (Hawkins et al., 2010), and trust in the technology (Van Velsen et al., 2016). We hypothesize that these factors affect the core factors of TAM that explain the intention to use (perceived usefulness and ease of use).

2.2.3 Loneliness

The De Jong Gierveld loneliness scale (DJGLS) is frequently used and developed in the mid-1980s in the Netherlands (de Jong-Gierveld and Kamphuls, 1985). The DJGLS is composed of eleven items, six negatively formulated and five positively formulated, with the three response categories ("no," "more or less," and "yes"). The total scale score is the sum of the item scores, ranging from 0 (not lonely) to 11 (extremely lonely). A score of three or higher is an indication of loneliness (van Tilburg and de Jong Gierveld, 1999).

2.2.4 Quality of Life

Quality of life is measured by the 12-item Short Form questionnaire version 1 (SF-12v1) (Ware et al., 1996). The SF-12 is a generic instrument including 12 items measuring health related quality of life (HRQoL). Six items are summed into a physical component summary (PCS) and six items are summed into a mental component summary (MCS). The total score for both scales ranges from 0 to 100, with a higher number indicating higher quality of life.

2.2.5 Focus Groups

Next to the quantitative data, qualitative data concerning the added value of this application for older adults are collected during focus groups. These focus groups with 6-10 users of the application are planned at the end of the intervention period of three months. Next to these focus groups, one focus group was organized at the beginning of the intervention period to assess the preliminary experience of the participants with the application.

2.3 Data Analysis

All outcome measures will be inspected for normal distribution of data using corresponding histogram plots including normal curves and normal probability plots prior to selection of appropriate statistical tests. Descriptive statistical methods will be applied for each of the outcome measures (demographic characteristics, usability, end-user acceptance, level of experienced loneliness and quality of life). Presentation of data will be done by calculation of mean ± standard deviation (SD), or median with range. To assess the improvement level of experienced loneliness and quality of life (pre-test versus post-test) a paired student t-test will be performed or its non-parametric equivalent. For statistical analysis, the level for significance will be set at $\alpha < 0.05$.

3 RESULTS

The evaluation of the GezelschApp started summer 2017 and is still ongoing. Until the beginning to December 2017 users of the application will be asked to participate in this study. Therefore all pre-test assessed will be finished in the first week of December. The post-test assessments are planned in the last week of February 2018. For this reason, the results that can be present in this paper are limited to preliminary results and therefore focus on the demographic of the current participants of the study and the outcome of the first focus group.

3.1 Participants

At this moment, (November 2017) 23 users (2 male and 21 female) were willing to participate in this study. All participants met the predefined inclusion criteria. The mean age was 72,9 years (range 60-91). Concerning the living situation, 17% of the participants are living together with a partner or spouse and 83% of the participants are living alone. All participants are community-dwelling older adults and were retired or un-employed.

3.2 Experienced Loneliness

All participants (n=23) complete the De Jong Gierveld loneliness scale. The average score on this scale was 4,9 (SD 3,7). This score correspondents to moderate loneliness. Focussing on the subscales of the DJGLS pre-test the participants score on average 3,3 (SD 2,2) on the emotional loneliness subscale (maximum score is 6) and 1,6 (SD 1,9) on the social loneliness subscale (maximum score is 5). Focus on the individual date 30% of the participants experience no loneliness, 52% of the participants experience moderate loneliness, 9% of the participants experience severe loneliness and also 9% experience very severe loneliness.

3.3 Results of the First Focus Group

At the end of august 2017, a first focus group was organized. The aim of the focus group was to assess the first experience of the users with the application and to see whether redesign of the application or part of the application was necessary. In total 10 users (5 male and 5 female) of the application participated in this focus group. The age of these participants was between 63 and 80 years old.

Table 1 provides an overview of the positive points and points for improvement of the application form the first focus group. Overall, the participants rate the application with a 6+ [range 4-7]. *"I am positive, a seven, the application is good and of course the application will improve after this meeting"*.

Table 1: Overview of the general experience with the GezelschApp.

Positive points
- The development of the application; "*as I am looking for company*."
- Nice and safe way to find new friends.
- I like the tips and possibility to find information about social activities in my neighborhood.
- The inbox. *"I always visit my inbox, to see if there are new messages"*
Points for improvement:
- Various technical improvements are needed (such as deleting messages) to increase to level of ease of use of the application.
- Clear guidelines for the set-up of the user account, similarity in the information of every user.
- Openness of the users and willingness to start new friendship by using the application. *"I am a little bit frustrated about the users that provided just a little bit of personal information. Maybe they are afraid, some resistance to open up."*
- More specific information about the activities.
- The opportunity to create new activities by the users, without interference of the coach.

Overall, the participants like the feature to make new friends the most. This feature was rated as the most interested feature. On place two of interested features, was the ability to send and receive messages and on place three of interested features, was the feature that provides tips to increase the number of social activities and social interactions.

4 CONCLUSIONS

Although the evaluation of the technology-supported health intervention to reduce social isolation and loneliness in older adults is still running, the first focus group with users highlight the need of the current application to make new friends in a save manner and to participate in social activities. Based on the outcome of the focus group the application is improved. As example, the information feature is changed in a bulletin board feature. This is a more dynamic feature were coaches can create new activities as requested by the users. Next to this, the role of the coach is improved. As the use of the application demands to change the social worker's working methods. The need to be proactive and send users messages and tips to increase the use of the application by the users is unusual.

The GezelschApp divers from existing applications to reduce social isolation and loneliness in older adults. The GezelschApp is by the initial screen of the social worker a secure and save (online) environment. Next to this, an active coach helps the users to participate in activities and close (online) friendships. Based on profile information and user data this coach sends personal messages and tips focussing on social activities, healthy and active ageing and the use of the application.

Considering the maturity of the technology and the aim of the technology the first evaluation of the GezelschApp focus on the endpoints: Usability, acceptance and possible working mechanisms. After this first evaluation, the added value of the GezelschApp can be accessed within an evaluation focussing on effectiveness or social impacts.

Considering the uptake of mobile phones by older adults, mHealth intervention, such as GezelfschApp, provide opportunities for increased uptake of technology-supported health interventions to address and reduce social isolation and loneliness in older adults.

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