International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

Designing an Intelligent System to Support the Elderly

Muhammad Adel Abd Al-Gany, Ali Majeed Kadhim, Maream Essa Faisal
University of Warith Al-Anbiyaa, Faculty of Engineering, Biomedical Engineering Department

Dr. Hayder M. A. Ghanimi
Lecturer, University of Warith Al-Anbiyaa, Faculty of Engineering, Biomedical Engineering Department

Ahmed Oleiwi Alubodi
Assistant Lecturer, University of Warith Al-Anbiyaa, Faculty of Engineering, Biomedical Engineering Department

ABSTRACT

Loneliness among older adults represents a significant societal problem and an important application domain for affective computing. 40% of older adults experience loneliness, which has been linked with various health problems, including an increased risk of cardiovascular disease and death ,by using android studio environment the smart android application built to measure and scale the loneliness level, the Results shows the effects on elderly that uses the application this research built which is InTouch, helps them reduce loneliness and it's risks upon older people health, direct and indirect strategies directly by sending message with the knowledge of the users and indirectly by sending sms message to their chosen ones (their close friends list).

CHAPTER 1 INTRODUCTION

1.1 Introduction

Loneliness among older adults represents a significant societal problem and an important application domain for affective computing. 40% of older adults experience loneliness[1], which has been linked with various health problems, including an increased risk of cardiovascular disease and death[2]. Loneliness also represents an important application domain for affective computing since loneliness represents an effective responseto social isolation. Automated systems that could identify and intervene in loneliness in older adults could have a significant positive impact on society, especially given the agingof populations in the world: the worldwide population of older adults is projected to triple to 1.5 billion in 2050, according to US Census Bureau projections. Social isolation represents a related problem in the elderly and another opportunity for affectively intelligent systems that provide companionship and social support. One study found that 5-year mortality is three times higher for socially isolated elders [3]. Several studies have also shown that the perception of social support can benefit health beyond actually receiving support[1].

Conversational agents designed to provide social support and wellness counseling— when coupled with the ability to sense and manage user affect and mood—represent a promising technology that has the potential to halt the tread of early loss of independence, illness, and death among the elderly. In this paper, we report on an experimental design study we have conducted over the last year on a conversational agent developed to provide social support and wellness counseling to isolated older adults in their homes for extended periods (months or years). Although many studies have now been conducted on the accuracy of affect detection methods, and a few studies have shown short-term efficacy in incorporating user affect into practical applications, such as tutoring systems[4], the "killer application" for affective computing has yet to

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

be found. We believe that social support systems for older adults may represent such an application, in which detection and management are essential and could be instrumental in saving lives.

1.2 Risk to Health

There is now substantial evidence that a lack of social connections significantly increases the risk of premature mortality.

The risk to health that loneliness can bring is more significant than those associated with many factors that currently receive substantial public health attention and resources (e.g., obesity, physical inactivity, air pollution).

We want to ensure loneliness is treated as a huge public health concern.

1.2.1 Loneliness and Physical health

- Loneliness increases the likelihood of mortality by 26% [5].
- The effect of loneliness and isolation on mortality is comparable to the impact of well-known risk factors such as obesity and has a similar influence as cigarette smoking [6].
- Loneliness is associated with an increased risk of developing coronary heart disease and stroke [7].
- Loneliness increases the risk of high blood pressure [8].
- Social isolation and loneliness are risk factors for the progression of frailty [9].

1.2.2 Loneliness and Mental Health

- Loneliness puts individuals at greater risk of cognitive decline and dementia [10].
- Lonely individuals are more prone to depression [11].
- Loneliness and low social interaction predict suicide in older age [12].
- Loneliness and isolation are associated with poorer cognitive function among older adults [11].

1.2.3 How Loneliness Affects Health

The pathways to explain how loneliness affects health are difficult to demonstrate. Threemain pathways have been suggested: behavioral, psychological, and physiological. Forinstance:

Social isolation and loneliness adversely influence activities of daily living that include functional status (individual's ability to perform normal daily activities required to meet basic needs, fulfill usual roles, and maintain health and well-being) among older adults [13].

- Have a direct influence on health-related physiology such as blood pressure and reduced immune functioning [14].
- People reporting loneliness have poorer sleep quality [15].

1.3 Risk Factors in Older Age

People of all ages can feel lonely, but as we age, risk factors that might lead toloneliness increase.

Such risk factors include:

1.3.1 Personal

- Being socially isolated or having no family or friends
- Being single, divorced, or separated

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

- Living alone
- Being aged 75+
- Poor health
- Developing or living with a life-limiting illness or disability
- Living with a mental health condition
- Poor health

1.3.2 Transitions in life that can contribute to loneliness

- Bereavement, becoming widowed
- Retirement
- Geographical relocation
- Living in a residential care home
- Becoming a carer
- Loss of mobility
- Sensory loss
- Giving up driving

1.3.3 Wider Society

- Lack of public transport
- Physical environment (e.g.no public toilets or benches)
- Fear of crime
- High population turnover
- Digital exclusion

1.4 Managing Loneliness in Older Adults

At least three approaches a live-in conversational agent could take in managing loneliness for older adults. First, agents could directly provide companionship and the perception of social support, by their mere presence and through social interaction (e.g., "small talk" [16]), but by providing a wide range of social activities that it could conduct with the elder, such as gameplay. Second, agents can address isolation by helping elders stay connected with friends and relatives via electronic communication, visit and chat coordination, and proactive prosocial behavior change interventions to establish and maintain friendships. Third, conversational agents can directly intervene in loneliness, depression, and other mood disorders, through talk therapy, ranging from simple active listening skills[17] to full-blown cognitive behavioral therapy[18], to the buffering effects of positive psychology interventions[19], for psychosocial longevity[20].

Physical activity is often prescribed for individuals with depression and other mental health conditions. Thus, an agent that promotes exercise should also indirectly improve mood. Only 12% of adults in the US over the age of 75 get the minimum level of physical activity currently recommended by the US Centers for Disease Control and Prevention, and 65% report no leisure time activity, and lack of physical activity has a significant impact on mortality in this age group[21].

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

1.5 Technology and Loneliness

Social media, smartphones and tablets, health informatics, the internet of things, and other forms of technology can increase loneliness and social disconnection for those unaccustomed to using them. The Castlehaven Community Association (CCA) recognizes the usefulness of technology as a means of addressing loneliness and the nervousness many can feel around unfamiliar software and hardware. In response, CCA has run 'tea and tech' sessions. 'Traditional' means of engagement (tea and cake) are put alongside engaging technology. Older people are invited to bring in their kits and are taught to use them by young adults working in local businesses and local secondary school students. The process of enabling older people to use technology to help alleviate their loneliness is also beneficial in creating inter-generational contact.

In the case of secondary school students, older people have participated as research subjects for oral history coursework assignments, adding depth to contact between older and younger people and a sense of reciprocal expertise and usefulness. The 'tea and tech' sessions can be seen as a 'supporting' form of foundation service. The expansion of health informatics and the internet of things provides new possibilities for commissioners, service providers, and individuals to help identify social isolation and loneliness and provide cost-effective means of addressing risk and loneliness. The Howz App,38, for example, monitors everyday electrical devices around the home to build an understanding of what constitutes 'normal' use of various products (for example, kettles) and can record how often an older person leaves the house or opens the front door to receive visitors. Sensors around the home also monitor heat, light, and movement and can build a picture of regular activity within a given household. Analysis of data from a household is available through a smartphone app. If the technology detects abnormalities in usages, such as a lack of visitors to the home or an extended period of staying in the home, people in a pre-designated support network can be alerted with suggestions about action to take.

1.6 The Aim of the Study

This study aims to synthesize and assess the evidence of the extent and nature of any association between loneliness and/or social isolation and health-related lifestyle behaviors risk, including the extent due to other related factors. These findings will lead to a better understanding of the development of targeted and effective interventions. The key objectives are:

1. Establish the association between loneliness or social isolation and key health-related behavior risks.
2. Assess the evidence for any causal relationship in any associations found.

1.7 Research about Questions and Responses

1.7.1 Overview of the Surveys Used for Testing

Two Overview of the surveys used for testing. We adopted the under took question testing on two surveys, the Opinions and Lifestyle Survey and the Good Childhood Index Survey:

The Opinions and Lifestyle Survey (OPN) is an omnibus survey conducted by Office for National Statistics (ONS). Data are collected over the phone for UK residents aged 16 years and over. The survey is conducted over eight months of the year, and data are available two months later. The survey achieves a sample size of approximately 1,100 respondents each month. Alongside various demographic variables, such as age, employment status, and living situation, the survey frequently includes questions commissioned by outside parties. This flexibility, combined with the rapid fieldwork and data delivery, means that the survey is commonly used for question testing.

The English Longitudinal Study of Ageing survey is carried out every two years in England on residents aged 50 years and over. The achieved sample size is typically between 7,000 and 9,000 respondents. The

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

first wave of data was collected from 2002 to 2003, and eight data waves have been collected. Wave 8 data were collected from 2016 to 2017 and published in 2018. The English Longitudinal Study of Ageing (ELSA) collects information on various topics, including demographic variables such as age and retirement status, physical and mental health aspects, household structure, and relationships with family and friends.

As part of their assessment, The English Longitudinal Study of Ageing includes questions on people's loneliness. Respondents are asked the direct question of loneliness and the University of California, Los Angeles measure of loneliness. Three-item scale with three response options (Hardly ever or never, sometimes, often). The loneliness questions areanswered via a self-completion questionnaire.

The Community Life Survey is a significant survey of adults aged 16 years and over inEngland, held annually and designed to track measures crucial to understanding society and local communities. It asks questions covering volunteering, views about the local area, community cohesion and participation, and subjective well-being.

The questions are asked either face-to-face or are completed online. Respondents are asked the direct question of loneliness with five response options (Often/Always, Some of the time, Occasionally, Hardly ever, or Never).

These two established surveys were used for comparability and the plausibility of using the combined (direct and indirect) measure of loneliness. This analysis focuses on establishing the reliability of the University of California, Los Angeles measure of loneliness. Scale about the direct measure of loneliness for adults and children, as well as analyze order effects and the effect of important demographic variables on loneliness.

1.8 Methodology

1.8.1 Missing Data and Weighting

"Missing data" refers to incidences when respondents have either refused to answer the questions on loneliness or have answered, "don't know." When missing data was found, list-wise deletion was used, which means the entire response was excluded from analysis if any single value from the University of California, Los Angeles (University of California, Los Angeles measure of loneliness.) scale or a direct measure of loneliness was unanswered. This is because if, for example, a respondent had not answered the direct measure of loneliness but had answered the University of California, Los Angeles measure of loneliness., the case could not be used in the analysis comparing the two.

Weights were included in the descriptive analysis to compensate for unequal selection probabilities and differential non-response. Weights were not used when statistical tests were run as the software used could not account for them correctly (for example, in calculating the degrees of freedom in a chi-Square test).

1.8.2 Presentation of the University of California, Los Angeles Measure of Loneliness Scores

In reporting the findings from the analysis, we used the University of California, Los Angeles measure of loneliness. Questions for adults and children as intended by the scale developers – that is, by assigning a score to each response and creating a total score by summing the individual scores.

For example:

- "Hardly ever or never" equals 1
- "Some of the time" equals 2
- "Often" equals 3

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

The lowest possible combined score on the loneliness scale is 3 (indicating less frequent loneliness), and the highest is 9 (indicating more frequent loneliness). There is no standard accepted score above which a person would be considered lonely, so no threshold for loneliness was used in interpreting the analyses.

1.8.3 Statistical Tests

To check the reliability and validity of the proposed loneliness measures, we used several statistical tests detailed in this section.

A p-value of less than 0.05 was taken as significant, as is reported in the statistics in the following section. This means that the test shows a statistically significant result, and the association between two variables is greater than would be expected by chance.

Pearson's chi square of association was used to see whether there was any association among selected variables. A chi-square test compares the observed frequencies with those you would expect to get by chance if there were no association. This test is used on categorical or ordinal data.

1.8.4 Frequency of Loneliness

Around two-thirds of respondents reported "Hardly ever or never" feeling lonely, 69.0% of respondents on The English Longitudinal Study of Ageing (ELSA) and 65.0% on OPN. The difference in reporting often feeling lonely was even smaller when comparing. The English Longitudinal Study of Ageing (ELSA) and OPN, at 6.8% and 6.3%, respectively (Figure 1.1). Respondents also reported similar scores in response to the University of California, Los Angeles measure of loneliness Scale (Figure 1.2).

The similarity between frequencies when comparing the OPN to The English Longitudinal Study of Ageing (ELSA) suggests that the OPN has measured the sameconcept of loneliness. The differences might be due to mode effects (the mode in which the survey is administered, such as telephone or face-to-face interview). However, without morerigorous testing and analysis of the different modes used, it is difficult to say whether this definitively accounts for the differences in proportions reporting frequent and less frequent loneliness.

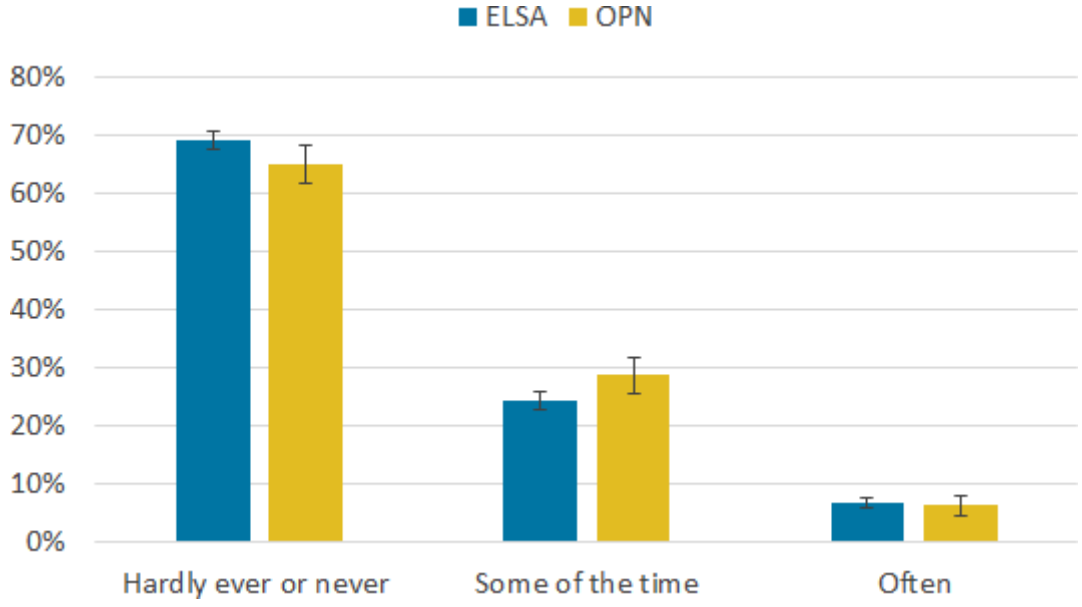

Figure 1-1 Reported frequency of loneliness for the direct measure

Source: Office for National Statistics: English Longitudinal Study of Ageing (The EnglishLongitudinal Study of Ageing (ELSA)); Opinions and Lifestyle Survey (OPN)

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

Notes:

1. The English Longitudinal Study of Ageing (ELSA) data is from wave 8 (2016 to2017).
2. OPN data is from July to August 2018.
3. 95% confidence intervals are displayed on the chart.

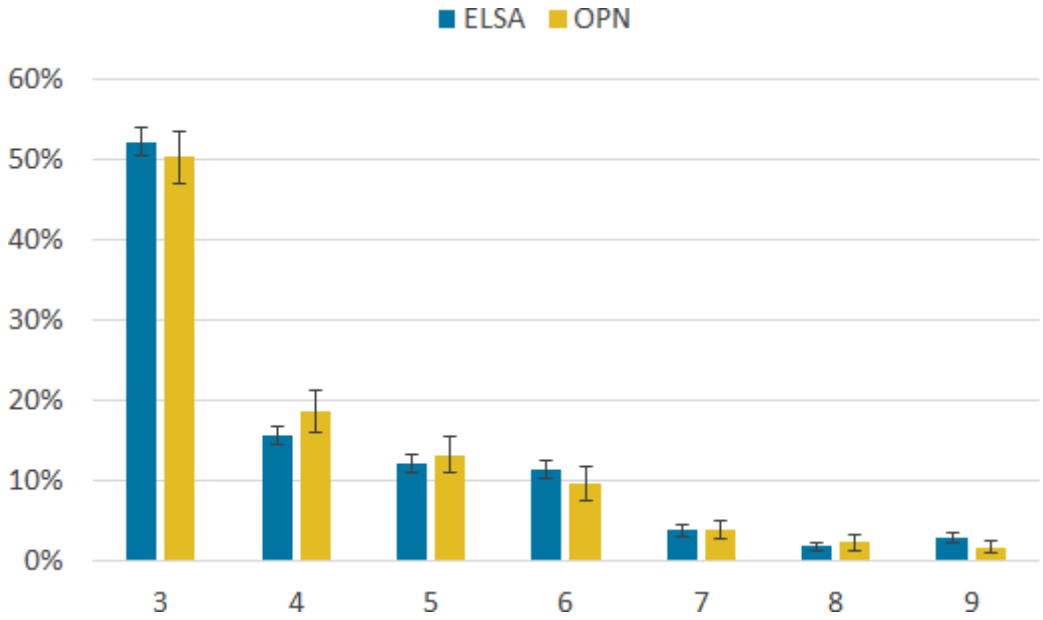

Figure 1-2 Reported frequency of loneliness on the University of California, Los Angeles measure of loneliness. scalefor wave 8 of the English Longitudinal Study for Ageing and the Opinions and Lifestyle Survey

1.9 Significant

Although it is hard to measure social isolation and loneliness precisely, there is strong evidence that many adults aged 50 and older are socially isolated or lonely in ways that put their health at risk. Recent studies found that [22]:

- Social isolation significantly increases a person's risk of premature death from all causes, a risk that may rival those of smoking, obesity, and physical inactivity.
- Social isolation was associated with a 50% percent risk of dementia.
- Poor social relationships (characterized by social isolation or loneliness) were associated with a 29% increased risk of heart disease and a 32% increased risk of stroke.
- Loneliness was associated with higher rates of depression, anxiety, and suicide.

Loneliness among heart failure patients was associated with a nearly four times increased risk of death, 68% increased risk of hospitalization, and 57% increased emergency department visits.

CHAPTER 2 LITERATURE REVIEW

2.1 The Concept of Loneliness

The phenomenon of loneliness is not easy to conceptualize, yet many people readily report it in many social circumstances. The importance of loneliness is often reflected in self- help books and the media, signifying an ever-present societal problem. Celebrities, for instance, often comment on the loneliness of stardom, despite their social revelry. JudyGarland once reported 'If I am a legend, then why am I so lonely? Let me

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

tell you; legends areall very well if you've got somebody who loves you'. Allen Fromme (1965), who wrote a pocket book on the ability to love, argued that loneliness is like the common cold in that it is easy to catch, difficult to cure, rarely fatal but always unpleasant, and sometimes wretched beyond bearing. Loneliness is also a regular topic of inquiry for callers to Lifeline, a telephone counseling service based in New Zealand. According to 2003 statistics, approximately 5000 ofthe 20,000 calls received by Lifeline related to loneliness, reflecting a widespread problem.

2.2 Theory

Most theorists agree that feeling lonely results from deficiencies in a person's social relationships, either qualitatively or quantitatively[23]. As reviewed previously, loneliness is considered a subjective, aversive, and often painful experience[24], yet the theoretical foundations in which loneliness is researched are not as solid as one may suspect. Borrowing aphrase from Selye (1980), who discussed stress, loneliness is a concept that has suffered from the mixed blessing of being too well known and too little understood. Fromm-Reichmann (1959)[25] described loneliness as one of the least satisfactorily conceptualized psychological phenomena, noting that it was not even mentioned in most psychiatric textbooks. The situation was scarcely better by 1986 when Medora and Woodward protested that there were neither well-defined theoretical frameworks explaining loneliness nor any consensus regarding its causes or consequences. Instead, research has relied upon theoretically murky concepts that cannot be well measured [26].

However, it is not through a lack of trying. Many different theories of loneliness have been proposed since the 1950s. Psychoanalytic and post-Freudian researchers believed that loneliness derives from childhood narcissism and hostility [27], unfulfilled infantile needs for intimacy [25], or lack of early attachment figures [28]. Humanist and existentialist theorists defined loneliness as a form of anxiety that leads to self-rejection[29]. Such theorists treated loneliness paradoxically as the pathological repercussion of believing that others will not understand and accept the inner self [30] and an everyday experience that deepens self-awareness. Cognitive theories on loneliness began to emerge and crystallize in the early 1980s with the collaborative efforts of researchers at the University Of California Los Angeles.

2.3 Cognitive Processes Perspective

Cognitive theorists have defined loneliness as one is cognitive expectations regarding relationships. Such theories argue that the primary determinates of loneliness derive from a combination of negative, internal, stable attributions about one's deficiencies in relationships [31], [32], irrational beliefs about the control one has over one's life [33], [34],or a discrepancy between desired and achieved relationships [35].

The key here is that loneliness is not a result of the absolute time spent with a desired other but whether that relationship fulfills the cognitive expectation of desired relationship fulfillment. The perception of social inadequacies, rather than actual inadequacies, increasesproneness to loneliness. Although cued by cognitions, the perceived discrepancy is associated with feelings of abandonment and a lack of attachment. Rather than mere dissatisfaction with not having someone to do an activity with. Although lonely people tend to have fewer social relationships than non-lonely people, a more relevant determinant of loneliness is dissatisfaction with the current social network. It is doubtful whether people would label themselves lonely unless cognitive cues were also present. For instance, cognitive indicators probably include the conscious desire for a personal relationship or the desire for more frequent social interaction. Therefore, loneliness can be heightened or reduced by changes in a person's subjective standards for social and intimate relationships [36].

2.4 Social and Behavioral Perspectives

Behaviorists tend to attribute the onset of loneliness to deficiencies in an individual's social skills. According to this perspective, social skills and competence are necessary to develop and maintain intimate and social relationships and avoid or alleviate feelings of loneliness [37], [38]. Positive behavioral qualities of social

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

interactions, such as meaningful social dialogue, play an important role in staving off loneliness [39]. Lonely individuals report or exhibit more negative interaction qualities (e.g., distrust, inhibition) and are unhappy with the degree of intimacy in their social interactions [40]. Moreover, lacking social skills can lead to behavior that tends to reduce rather than increase human contact.

Therefore, according to behaviorists, a self-perpetuating cycle of defeat can be established, significantly increasing susceptibility to loneliness. Conceptually and methodologically, the cause and effect of loneliness can be the same. For example, low self-esteem can be both an initiating factor, and it can also be a consequence of loneliness [41].

2.5 Literature Review

On 11 March 2020, the World Health Organization(WHO) declared the global spread of coronavirus disease 2019 (COVID-19) a pandemic[42]. Countries worldwide established escalating containment measures to reduce virus transmission, including travel bans, closure of country borders, and lockdowns. In the United Kingdom, over 1.5 million people were told they must self-isolate or "shield" themselves for at least 12 weeks[43]. In addition, strict social distancing guidance in the UK and internationally advised the public to eliminate all non- essential travel and stay home[44]. While these measures were initially eased, social distancing measures remain in place, cases and contacts are required to self-isolate, and other national lockdowns have been re-introduced worldwide [45],[46]. To date, there has been limited literature evaluating the available interventions to protect the mental health of people asked to quarantine, socially distance, or shield during the COVID-19 pandemic. This has prompted a call for high-quality research on the effects of COVID-19 on mental health and how to mitigate them. One possible consequence of both the shielding of vulnerable people and the social distancing restrictions for all is physical separation leading to social isolation. Social loneliness isolation refers to the objective lack of interaction with others. The concept of loneliness is similar but refers more generally to the subjective feeling of being alone. Earlyevidence suggests almost one quarter of adults in the UK have experienced loneliness when living under lockdown, while the average person's daily number of contacts has been reduced by up to 74% , There is strong evidence that both social isolation and loneliness are associated with increased all-cause mortality, cardiovascular disease, depression, and anxiety,

Previous reviews on social relationships and causal associations with ill-health have not employed clear definitions or included objective and broader measures of functional social support, social integration or social capital[5], [6], [47]–[49] or other related measures, e.g., living alone[50]–[52], or marital status[53]–[55]. Many reviews on social isolation or loneliness do not address the evidence for a causal relationship with ill-health[5], [56]–[61]. Of the few reviews which have investigated the causal pathways, most have used a discursive theoretical approach rather than a systematic synthesis of empirical data or given limited examination of behavioral pathways[62][59][63]. Two reviews have specifically considered the potential indirect health risk due to lifestyle factors, but these are either outdated, not systematic, not focused on older people, or consider only a single health behavior[64][65]. In addition, only a few reviews have focused on older adults and ill-health despite the prevalence of loneliness/social isolation being most significant in this group[57][61][66].

2.6 Tools Used

2.6.1 Adobe XD

Adobe XD (also known as Adobe Experience Design [67]) is a vector-based user experience design tool for web apps and mobile apps, developed and published by Adobe Inc. It has been built from the ground up with performance top of mind, Adobe XD helps you craft prototypes that look and feel like the real thing, so you can communicate your design vision and maintain alignment across your team efficiently. Adobe XD is a powerful and easy-to-use vector-based experience design platform that gives teams the tools to craft the

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

world's best experiences collaboratively. It is available for macOS and Windows, although there are versions for iOS and Android to help preview the result of work directly on mobile devices. Adobe XD enables website wireframing and creating click-through prototypes. XD is used for (Website design, App design, Voice assistant design, Marketing campaigns, And Game design).

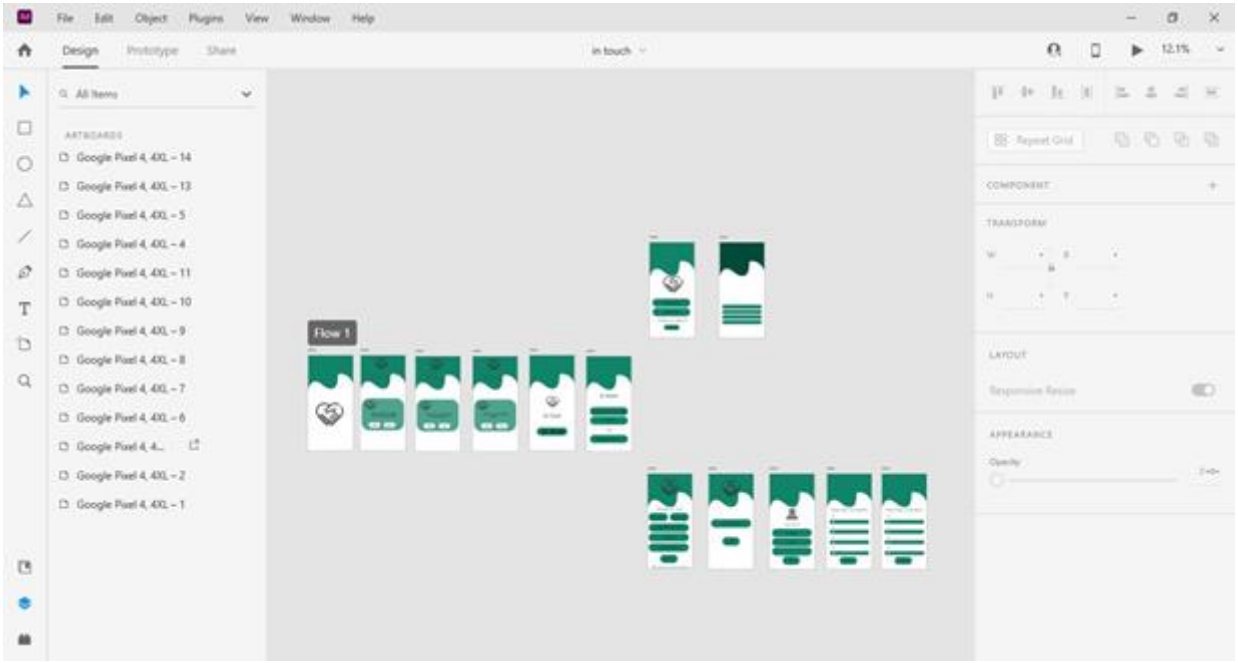

Figure 2-1 Adobe XD interface

2.6.2 Android Studio

Android Studio is an open source and Linux-based Operating System for mobile devices such as smartphones and tablet computers. Android was developed by the Open Handset Alliance, led by Google and other companies. Android offers a unified approach to application development for mobile devices, meaning developers need to develop only for Android based on IntelliJ IDEA [68]. On top of IntelliJ's powerful code editor and developer tools, their applications should be able to run on different devices powered by Android. The first beta version of the Android Software Development Kit (SDK) was released by Google in 2007, whereas the first commercial version, Android 1.0, was released in September 2008. On June 27, 2012, at the Google I/O conference, Google announced the next Android version, 4.1 Jelly Bean. Jelly Bean is an incremental update with the primary aim of improving the user interface in terms of functionality and performance. The source code for Android is available under free and open source software licenses. Google publishes most of the code under the Apache License version 2.0, and the rest, Linux kernel changes, under the GNU General Public License version 2[69].

2.6.2.1 Android Advantages

1. Android is termed open source – Which means that it is free for use by anyone
2. Multitasking - Android telephones can run numerous applications; it implies you can peruse while tuned in to the tune.
3. Can introduce and adjust ROM - We now and again locate an informal ROM. That is the rendition that was not as per the detailed discharge of our receivers. The last way is change. Does not stress that there is numerous conventional ROM that you can use on Android telephones, and ensure not to hurt your gadget.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

4. Gadget – With the gadgets on the home screen, you can easily get to an assortment of settings rapidly and effortlessly without much of a stretch.

2.6.2.2 Disadvantages Android

1. Require web association - Android requires a dynamic web association. At any rate, there should be a GPRS web relationship in your general region so that the device is set up to go web according to our requirements.
2. Publicizing - Applications in the Android telephones can be obtained easily and to no end, yet the results in each of these applications, will reliably be commercials on display, either at the top or base of the application.
3. Inefficient Battery - Android is more wasteful than some other working system since this working structure is a huge amount of "process" beyond anyone's ability to see that incite the battery quickly exhausts.
4. Numerous applications comprise virus - the infection installed android applications including Counter Strike Ground Force is a photo, et cetera. Android Applications contain diseases moreover displayed in the Android Market.4.3.4 Android program language.

2.6.2.3 Android Studio Applications

Android applications are usually developed in the Java language using the Android Software Development Kit. Once developed, Android applications can be easily packaged andshared through a store such as Google Play or the Amazon Appstore.

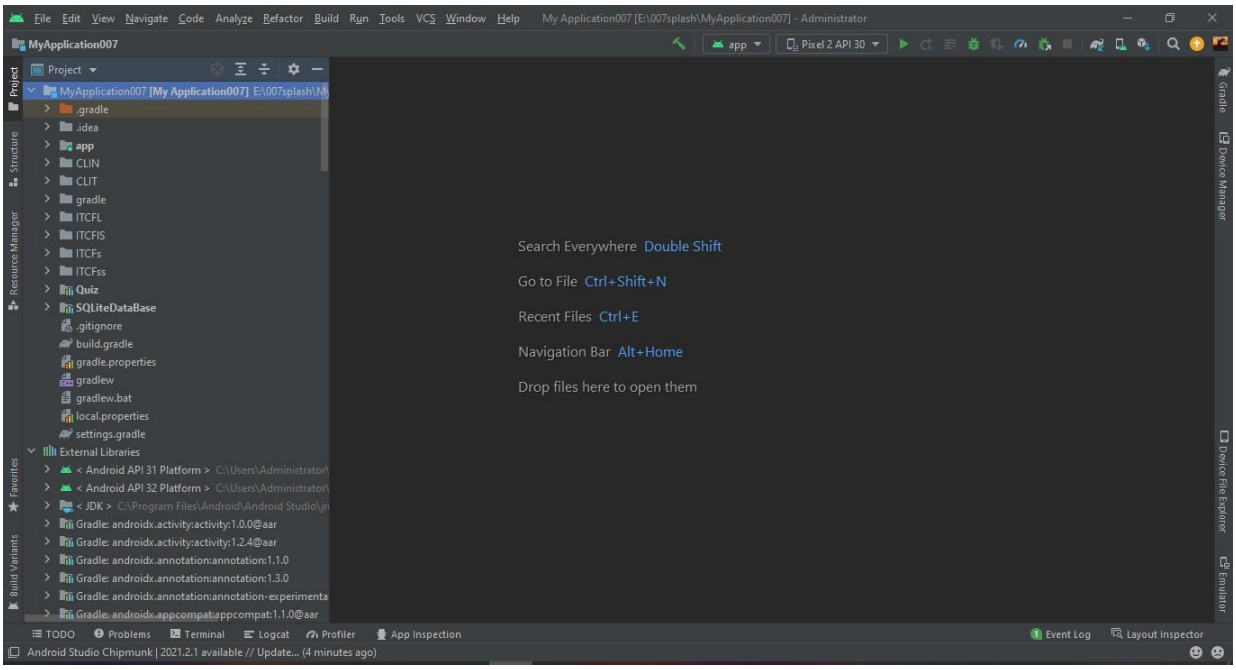

Figure 2-2 Android Studio Interface

2.6.3 Java Language

Java was conceived by James Gosling, Patrick Naughton, Chris Warth, Ed Frank, and Mike Sheridan at Sun Microsystems, Inc. in 1991. It took 18 months to develop the first working version. Initially called “Oak,” this language was renamed “Java” in 1995. Between the initial implementation of Oak in the fall of 1992 and the public announcement of Java in the spring of 1995. Many more people contributed to the design and

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

evolution of thelanguage. Bill Joy, Arthur van Hoff, Jonathan Payne, Frank Yellin, and Tim Lindholm were key contributors to the maturing of the original prototype[70].

2.6.4 Firebase/Database

In the era of rapid prototyping, we can get bright ideas, but sometimes they are not applicable if they take too much work. Often, the back-end is the limiting factor - many considerations never apply to server-side coding due to lack of knowledge or time.

Firebase is a Backend-as-a-Service (BaaS) that started as a YC11 startup. It grew up into a next-generation app-development platform on the Google Cloud Platform. Firebase is a real-time database that allows storing a list of objects in the form of a tree. We can synchronize data between different devices[71].

Google Firebase is Google-backed application development software that allows developers to develop *Android, IOS, and Web apps*. Firebase provides several tools for reporting and fixing app crashes, tracking analytics, and creating marketing and productexperiments.

2.6.5 SQLite Database

SQLite is an in-process library that implements a self-contained, zero-configuration, serverless, transactional SQL database engine. The source code for SQLite exists in the publicdomain and is free for both private and commercial purposes. SQLite binds several programming languages such as C, C++, BASIC, C#, Python, Java, and Delphi. The COM (ActiveX) wrapper makes SQLite more accessible to scripted languages on Windows, such as VB Script and JavaScript, thus adding capabilities to HTML applications. It is also available in embedded operating systems such as iOS, Android, Symbian OS, Maemo, Blackberry, and WebOS because of its small size and ease of use[72].

2.7 Intervention Categories

Interventions were categorized, which describes six groups using thematic analysisbased on the purpose and mechanism of action: social facilitation interventions; psychological therapies; health and social care provision; animal interventions; befriending interventions; and leisure/skill development. The social facilitation category describes interventions with the main purpose of facilitating social interaction between peers, aiming to benefit all involved participants mutually. This contrasts with befriending interventions, which focus on forming new friendships, usually with volunteers to support the lonely individual. Psychological therapies use trained therapists to deliver recognized psychological or cognitive interventions, while health and social care provision involves support from health or social care professionals. Animal interventions use real or artificial animals as the focus of the intervention, while the leisure/skill development category is a broad classification of interventions that provide leisure activities or promote learning a new skill. We used an additional category, educational program, for interventions that mainly seek to educate participants on more general topics relevant to social isolation/loneliness or health and well- being.

2.8 Intervention Effects on Loneliness

This section presents an overview of the key types of intervention for loneliness, along with evidence of effectiveness. Systematic reviews have reported very little high-quality research into effective interventions to reduce loneliness in later life. The subjectivity and heterogeneity of loneliness, both that experienced in later life as well as the experiences overthe life course which may have shaped these feelings, may partly explain why a ‘one sizefits all approach to interventions has produced disappointing results on the impact of interventions [73].

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

Interventions and services to alleviate or prevent loneliness in 'at risk' groups have, for several decades in the developed world, been provided by the welfare state and voluntary sector groups. Currently, three main types of community-based services to alleviate loneliness are common in the UK. These may be:

1. Run by the local government as part of social services or community resources,
2. Run by local government or other public sector funded voluntary sector organizations,
3. The self-funding community offers self-help, and voluntary bodies that receive no/little state support but are linked to the neighborhood, leisure, self-help, educational, occupational, or faith groups [73].

One-to-one services most commonly refer to 'befriending.' These contacts may be face-to-face, by telephone, or via the internet and are based on the older person being matched with a volunteer who makes regular contact. One-to-one interventions can also include interventions including animals (either real or robotic). Most views on such interventions are from those already engaged with services. There is mixed evidence to support befriending. Befriending had a modest effect on depressive symptoms and emotional distress. A recent systematic review and meta-analysis of befriending for a range of physical and mental health indications and patient-relevant outcomes, including loneliness, found no significant benefit in loneliness.

Fourteen trials and 2411 participants were included in the meta-analysis; 11 studies were randomized controlled trials (RCTs), and three were quasi-experimental studies. Loneliness was assessed in only five studies, of which three were rated high quality, one medium, and one low quality. The last two systematic reviews of trials included studies of adults and did not differentiate findings for older people. Other one-to-one interventions include using new technologies, which have shown some promise in alleviating loneliness, but the range of technologies is broad (for example, video conferencing, use of games consoles, and robotic pets), so they are difficult to compare, and the studies were of small sample sizes[73].

2.9 Preventing Isolation Among Older People

Here are some tips for preventing loneliness:

1. Stay in touch with friends and family.

   It is great to see people in person, but phone calls, social media, and emails can help keep you connected too. If you are not yet comfortable with computers, ask a young relative, friend, or neighbor to help you.

2. Volunteer in your community.

   Helping others is a fantastic way to give something back to the community and remind yourself that even later in life, you, too, have a great deal to offer.

3. Join a group.

   Your local library is a good resource with details of local groups available. Also, your local council can give you details of courses or groups you may be interested in trying.

4. Join a Class or Club

   Joining a class or club can also provide a sense of belonging that comes with being part of a group. This can stimulate creativity, give you something to look forward to during the day, and help relieve loneliness.

5. Adopt a Pet

   Pets, especially dogs and cats, offer so many benefits, and preventing loneliness is one of them. Rescuing a pet combines the benefits of altruism and companionship and fights loneliness in several ways.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

6. Talk to Strangers

   An easy way to find connections in everyday life is by interacting in small ways with acquaintances or strangers you encounter. Research shows that doing so contributes to our social and emotional well-being.[74] So next time you grab a cup of coffee or see your neighbor on a walk, start a conversation. You might just find you feel happier afterward.

7. Practice Self-Care

   When you feel lonely, be sure you are doing what you can to take care of yourself in other ways. Self-care is always a good idea, especially when feeling down. Eating nutritious food.

8. See a Therapist

   Research suggests that loneliness and symptoms of depression can perpetuate each other, meaning the more lonely you are, the more depressed you feel, and vice versa.[9]

9. Gardening

   If looking after your garden has become too strenuous, it doesn't mean your gardening days are over. Schemes such as Garden Buddies and Garden Friends match people over 60 with volunteers who will help with your garden.

10. Join a Heart Support Group

    Heart Support Groups are friendly, supportive local groups for people with heart conditions and their families. Activities vary between groups but typically include exercise classes tailored for people with heart conditions and talks about different topics.

11. Go to the cinema

    The allure of visiting the cinema and watching a great movie never fades. Most big cinemas have special screenings for older people at discounted rates, and some also provide free hot drinks and biscuits, so you can chat and make the occasion a little more sociable.

2.10 Factors Relating to the Person

Researchers have linked loneliness to a consistent and wide variety of individual characteristics. Without blaming lonely individuals for their plight or minimizing the structural and environmental factors that can aggravate loneliness, it is important to recognize that certain dispositional characteristics predispose some people to experience severe loneliness, more so than others. As such, demographic, affective, personality, and behavioral factors can play a determining role in the development of loneliness.

2.10.1 Demographic Factors

Research by Page and Cole (1991) indicates that marital status, household income, gender [75], and educational attainment are significantly associated with self-reported loneliness. Participants were asked to indicate how often they felt lonely during the past year on a singular scale ranging from 'very often' to 'never.' The random telephone study of 8634 North American adults suggested that marital status was the strongest predictor of loneliness, with married participants reporting the slightest loneliness. Maritally separated participants reported the greatest loneliness. According to the research findings, loneliness is more prevalent amongst lower-income groups. Presumably, lower-income groups have less access to resources, such as time, money, and social opportunities, which would explain why loneliness is higher among lower-income and the unemployed [24].

Like previous research (e.g., Borys & Perlman, 1985), Page and Cole found that women were more likely to admit feeling lonely than men. However, whether this reported difference is caused by actual differences

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

in the experience of loneliness or by differences in the willingness of men and women to report degrees of loneliness is questionable. Gender differences in the reporting of loneliness could reflect a sex bias in self-disclosure, perhaps an underlying cause of the observed gender differences in loneliness. In essence, lonelinessrelates to gender only when individuals are asked to respond to measures that use items containing the words "lonely" or "loneliness" as opposed to questionnaires that do not make specific reference to the construct. When the measure refers to the construct explicitly, the gender effect appears to be attributable to males being less willing to report loneliness. However, Borys and Perlman (1985) have argued that, in general, there are no true gender differences in loneliness [76].

2.10.2 Affective and Attachment Factors

In general, loneliness is characterised by negative emotions and tends to be correlated with feelings of sadness, anxiety, boredom, self-deprecation, and marginality [77]. Loneliness has been linked with poor psychological health, and research indicates that loneliness and well-being are strongly related. However, the causal direction of the relationship is unclear [78]. With regards to affective responses, loneliness is associated with dispositional characteristics such as pessimism [79], depression [31], shyness [80], low self-esteem [81], guilt [82], and is strongly negatively correlated with happiness [83], and life satisfaction [84]. It would seem that Duck, Pond, and Leatham's (1994) [85], a summation that loneliness provides a negative lens through which the world is viewed, is particularly accurate. Lonely individuals judge their relationships from a negative perspective, enhancing negative cognitive appraisals and affective responses about future relationships.

For most people, however, loneliness is not a permanently distressing condition. Loneliness can be dissipated, as if by magic, through the emotional connection with another individual or the meeting of a romantic partner. Correlational studies suggest that finding a social connection with just one companion may be sufficient to buffer feelings of loneliness for those at risk of social isolation [86]. For some individuals, even the prospect of a potentially intimate relationship is sufficient to dispel loneliness [47] temporarily. Interestingly, this finding is not peculiar to adult relationships. Parker and Asher (1993) [87]

2.10.3 Personality Factors

Research has consistently identified introversion and neuroticism as the two main personality factors related to self-reported loneliness [88]–[91]. Introversion tends to be associated with quiet, contemplative people who prefer smaller gatherings. However, the expression of introversion can be misconstrued by others as unfriendly, uninvolved, and socially awkward. On the other hand, extroverted individual tends to be gregarious and outgoing. They enjoy social company, prefer risk-taking opportunities, and require stimulation. From this description, extroverts are likely to be more active and deliberate than introverts in seeking out social contacts and situations [90]. Lower extraversion scores (that is, introversion) tend to be associated with higher loneliness scores [81], [92]. Conceptually, one would expect introverts to report low levels of loneliness due to their desire for more privacy and social reservation. In other words, one would expect the discrepancy between their desired and actual relationships to be fairly low. However, introverts who report high loneliness scores may be dissatisfied with the quality of their current relationships and manifest behaviours which inhibit the promotion of interpersonal closeness.

Additionally, extraverts would appear to exhibit very behaviors that increase the likelihood of social and interpersonal contact, which, in turn, reduces the likelihood of experiencing loneliness [92]. Demonstrating positive social and personal characteristics, which helps create interpersonal attraction and social desirability, is a significant step in conquering loneliness [77]. After all, who wants to be with an individual who is depressive, socially apprehensive, and who appears to lack social skills or emotional sensitivity? Personality factors affect loneliness in several ways by perpetuating or reinforcing loneliness in a circular process. For instance, characteristics such as shyness and low self- esteem may reduce a person's

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

social desirability and interpersonal attractiveness, which can contribute to unsatisfactory patterns of social interaction.

Additionally, specific personal characteristics may influence how an individual reacts to changes in their social environment and thus affects how they cope with loneliness. If, for instance, people are relocated to another city where they have few or no friends or family, they may experience a period of loneliness. However, if they are naturally gregarious and seek social stimuli, they will likely overcome their loneliness compared to those who are socially reserved and inhibited. Such characteristics may therefore predispose people to feel lonely and reduce their ability to alleviate loneliness [93].

2.10.4 Behavioural and Social Competence Factors

Although loneliness is primarily a private psychological experience, it tends to manifest in the behavioural realm. Behaviourally, loneliness is often associated with self- focus, shyness, and low social risk-taking. As such, lonely people tend to be less assertive thannon-lonely people, which may hinder their social interactions in greater loneliness [94].

Loneliness has also been associated with a range of social network factors, includinginfrequent contact with friends [95], having few friends and spending time alone [96], and low intimacy of relationships with best friends [97]. Moore and Schultz (1983)demonstrated a relationship between loneliness and external locus of control [98], social anxiety, and selfconsciousness, while Jones, Freemon, and Goswick (1981) showed that loneliness was associated with low trust, a sense of powerlessness, and social isolation. Nevertheless, [99], several studies contradict these findings, observing no association between loneliness and social interaction [100], network size [91], or reciprocation offriendship [97].

Research by Spitzberg and Hurt (1987) has found a reciprocal relationship between interpersonal skills and loneliness [101]. In general, the study found that less interpersonallyskilled individuals were more prone to experience feelings of loneliness. The researchsuggests that individuals with ineffective interpersonal skills are more susceptible to social exclusion, which can fuel feelings of loneliness, leading to less competent social interaction [96], [101]. Despite loneliness being associated with interpersonal deficiencies, it tends to be positively correlated with social sensitivity, which is the ability to decode verbal communication from others [102]. An explanation for this unusual research finding Segrin argued that because lonely individuals are aware of the feeling of interpersonal discomfort and rejection, they are perhaps cued to and able to pick up on rejection expressed by others.

2.11 Factors Relating to the Situation

Many private situations can induce feelings of loneliness, ranging from spending evenings alone without intimacy or companionship to queuing at the supermarket andrealising that one's trolley is filled with pre-packaged dinners for one. However, other more socially intense situations can instigate feelings of loneliness. Portrays loneliness as being "in the midst of a rushing mass of people on the subway at a rush hour [103]. Many people, who are strangers with unfamiliar faces and unknown destinations, who go in the same direction, stand beside each other, and may occasionally be crushed up against and touch each other, and remain strangers who do not know each other and do not care to know".

By definition, loneliness experienced because of social deficits implicates the social environment. In other words, a deficiency in social relationships might reasonably imply an environmental trigger for the experience of loneliness. However, despite the intuitive notion that loneliness could be attributable to the social environment or context, it is a much- neglected area of research. Loneliness researchers often gloss over situational or contextual cues, preferring to study personal factors in the experience of loneliness. Situations vary in the opportunities they provide for social contact and the initiation of new relationships.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

Situational constraints, such as time, distance, or money, are fundamental. Others are more complex, requiring intense psychological adaptation [104].

Peplau and Perlman (1982) isolate two distinct causes of loneliness in their framework for understanding it: precipitating events and predisposing factors. Generally speaking, any event that disrupts the individual's social network is considered a potential precipitating factor for loneliness [23]. Precipitating events include, for example, changes to the person's actual social relationships, such as the ending of a close relationship through death, divorce, separation from an intimate relationship, imprisonment, leaving home, migration, hospitalisation, the 'empty-nest' syndrome, retirement and relocation. Loneliness can also be triggered by changes in the person's social needs or desires, which may precipitate loneliness if actual relationships do not accompany desired changes. The precipitating event that causes loneliness most frequently involves a disruption in close relationships with others. The most extreme form of relationship loss is bereavement [105], which would be expected to lead to profound loneliness due to its unpredictable nature.

2.12 An Interaction Approach to the Study of Loneliness

It would seem a reasonable proposition that loneliness is solely caused neither by social or environmental constraints nor merely the result of personality characteristics. Instead, it is an interaction between the person and the environment. Although mentioned in the literature, the structural conditions in which loneliness is formed are seldom analysed. Furthermore, understanding how such interactions jointly affect vulnerability to loneliness has unfortunately been overlooked in much of the research literature [36]. As such, the current literature base is not balanced between the individual characteristics that drive loneliness and the picture of social and environmental reality [106]. However, a few morsels within the literature represent the connection between the social environment and personal characteristics.

Early findings on loneliness suggest the experience of feeling lonely has little to do with the number of social relationships an individual may have but rather the quality and meaningfulness of those relationships (e.g., Gaev, 1976 [107]). However, early research by Jones (1981) [100], Stokes (1985) [91], and subsequently by Damsteegt (1992) [108] suggests that a poor social network does significantly impact feelings of loneliness. Damsteegt's research indicates that lonely individuals have a poorer social network and a poorer mental set in terms of feeling alienated, resentful and bitter. As such, lonely individuals expect to be and are more prone to rejection from their peers.

In developing a mediating model of loneliness, Kraus and her colleagues [109] conceptualized loneliness using Weiss' (1974) [110] concept of social provision, in that relationship evaluation is determined by feelings of attachment, social integration, reassurance of worth, nurturance, reliable alliance, and guidance. The model of loneliness jointly incorporates person factors, ecological factors, and the individual's social network. In an empirical test of the model on 509 university students, the researchers concluded that ecological factors, such as living arrangements and recent relocation, affect loneliness indirectly via the impact on one's social network and relationship evaluation.

2.13 Coping with Loneliness

In many respects, and for many people, the most direct and satisfying long-term remedy for loneliness is engaging in a meaningful relationship or improving relationships with compatible others. Rokach and Brock (1998) have looked at coping strategies perceived as helpful by research participants identifying themselves as lonely [111]. The strategies were grouped into six factors: acceptance and reflection, self-development and understanding, social support network, distancing and denial, religion and faith, and increased activity. Earlier research by Shaver and Brennan (1991) suggests that chronically lonely individuals tend to engage in passive, ineffective, and unhealthy coping strategies such as watching television or overeating, which tend to be inadequate mechanisms for overcoming loneliness [112]. Such strategies do not focus on the deficient social environment or the cognitive cues perpetuating loneliness.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

Those who cope well with loneliness tend to engage in active behaviours, such as social groups or creative and self-fulfilling activities. Such behaviours would actively direct one's attention away from lonely thoughts and diminish the perceived gap between the ideal and actual social environment [36]. In testing this hypothesis, Shaver *et al.* (1985) found that 'state-lonely' subjects preferred active coping strategies [113], tended not to make self- derogatory attributions, and were sufficiently socially skilled. In contrast, 'trait-lonely' individuals attributed their loneliness to internal and stable causes and failed to seek adequate solutions to cope with their loneliness. In other words, trait-lonely subjects were resigned to their loneliness, whereas state-only subjects were more optimistic about their situation and coped more effectively with their feelings of loneliness.

According to Rook and Peplau (1982), most people overcome loneliness by forming new relationships [30], utilising their existing social network more, or substituting human relationships with media personalities or pets. However, such a conclusion raises one of the many complexities surrounding research on loneliness, in that difficulties relating to others *and* difficulties in spending time alone have been cited as contributing to loneliness. One research version suggests that lonely people have little tolerance for aloneness (e.g., Greene & Kaplan, 1978 [114]) and feel desperate distress when alone. Clinicians have recommended teaching lonely individuals to engage in solitary activities or to increase their skills in being alone to overcome their distress [36]. The second school of thought suggests that solitude offers protection from interpersonal stress and may be particularly appealing as a coping mechanism for lonely people. Solitude, in this respect, is a protective device to avoid potential threats to self-esteem perpetuated through low social or assertion skills [36]. This coping style is particularly apparent in lonely individuals [113] and is likely to change over time as the individual strives for a balance between interpersonal meaningfulness and privacy. As such, Rokach and Brock (1998) suggest that coping with loneliness involves various techniques that seem to correspond with the cognitive, emotional, and behavioral components of the experience [111].

CHAPTER 3 METHODOLOGY

3.1 Problem Identification

To become our best selves, we do not need much. Such simple things as love, support,and the ability to feel empowered help us live a healthy and happy life. In contrast, the inability to feel connected, lonely, and like an outsider makes us sad and damages our healthby causing chronic diseases. After the pandemic has limited our social interactions, loneliness has become even more dangerous, slowly killing us from the inside. So, how can we leverage technologies to battle loneliness? The solution is in online communities. Many community admins use Facebook groups and Slack software to communicate with community members. Unfortunately, such messaging tools cannot provide a meaningful connection to a society's members.

For this reason, the development of community applications is becoming more popular in recent years. A society-based app is the best alternative to social networks, whereinstead of feeling engaged, users feel even lonelier than offline. Community applications serve online communities, a group of people with similar interests, values, and beliefs tohelp them engage socially. An application for the community is where people can create andupload multimedia content, share it with other members, discuss topics in built-in forums, and share their ideas. At the beginning of the 2000s, all such societies existed in web-based forums, where members created threads to discuss something with others. Now, thanks to developed technologies, mobile devices are affordable for anyone. So, you can connect with society members via local community apps.

"Older adults are a largely untapped source of smart, sociable people but are at risk of being excluded from the digital age as they often cannot access the information others have at their fingertips. Rather than isolating them from the digital world, our project looks at co- creating something that works for them - opening up a brand new world of information that should create more social opportunities and a greater feeling of community."

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

While many of the community see devices like tablets and smartphones as ways to enhance social circles, our project shows that older adults do not feel the same way. Welcome to InTouch and be In-Touch with the world.

3.2 Prototype

3.2.1 User Interface Design

After the use case definition and analyses, the low-fidelity prototype was created to evaluate the usability of the use case and provide the end-user, the operator, a directexperience with the user interface.

These sketches were the first version of interface design. Although they looked very different from the functional demo presented at the end of the thesis work, they were significant and obligatory in the development process. After discussing the sketches with theend-user and other potential users, some designs were changed, and other good ideas came up.

With modifications and some new inspirations, the next step of a low-fidelity prototype was designed via Abode XD to obtain a better view of approaching an actual application's user interface.

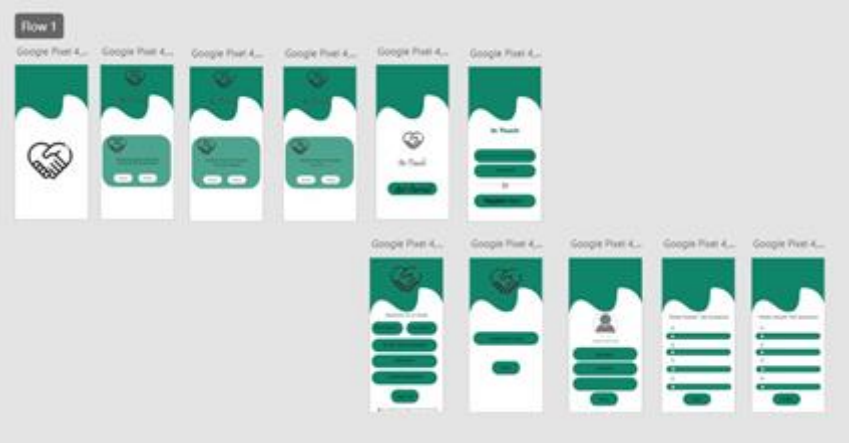

Figure 3-1 Adobe XD application design

3.3 Application Development

3.3.1 Android Environment and Tools Set-up

According to the Android Developer website [115], the processes and workflow involved in producing an Android application are as follows. First is the set-up of the development environment where all the tools are installed. These tools include the

Android SDK, Android Development Tools, and Android Platforms. Eclipse is also the preferred IDE for developing Android applications due to its ability to invoke the tools needed for development, although other IDE can also be used. The next step would be to set up an Android Virtual Device (AVD) using an Android Emulator [116], which would allow the simulation of an Android application on a desktop pc. This can be done using Eclipse AVD Manager or from the command line. It is also important to set up an actual hardware device (e.g., smartphones running Android OS) to run the application once it has been developed. This can be done using the tools already in the SDK kit provided by Android or using Eclipse to directly installed it onto a mobile device. Nevertheless, it must be kept in mind that applications must also be tested on the emulator with different settings and configurations (e.g., different Android versions, varying screen sizes).

Next would be to set up Android projects (e.g., .apk files), which would act as containers to place codes and resource files. A specific structure must be followed due to constraints from the SDK tools. Other projects

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

supporting the Android development process include Test projects(test application codes) and Library projects(shareable Android source code to be referenced in Android projects). Some things to consider during this stage include resource conflicts and using prefixes to avoid them, library projects can include JAR libraries, the platform version must be equal to the Android project, and library projects cannot include raw assets[51]. After the application has been coded, it can be debugged and tested. The Android project is firstly built into a debuggable .apk package which can be installed and run on an Android emulator or device. Then the application must be debugged using a JDWP-compliant debugger that is used together with debugging and logging tools that Android SDK provides.

The application can then be tested on an integrated testing framework already provided by the Android framework [52]. The diagram below from the Android Developer website can summarise the process.

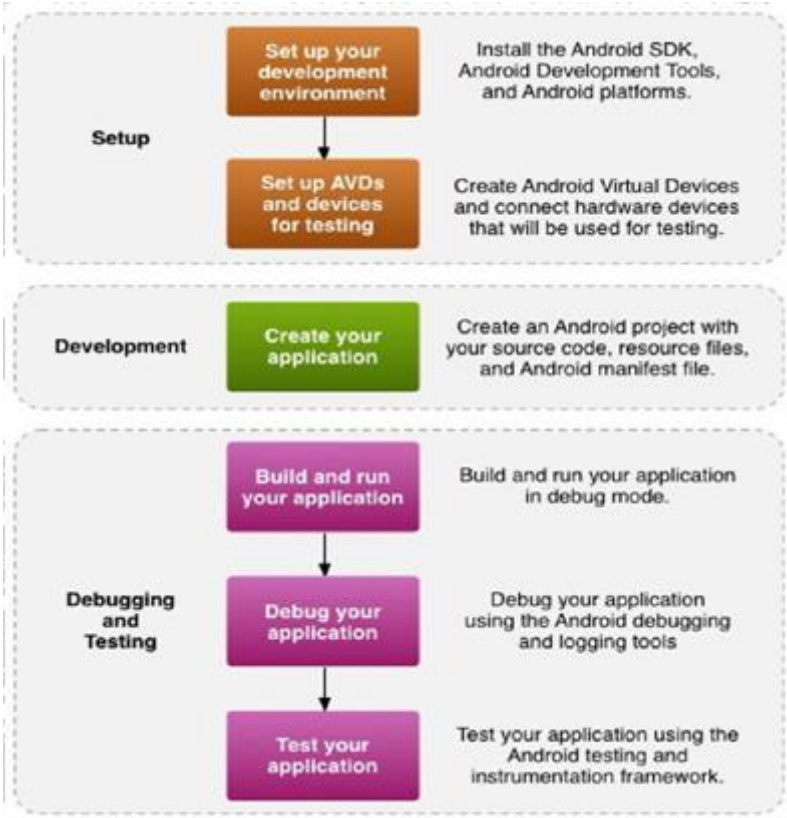

Figure 3-2 A summarised diagram of the Android

3.3.2 Android Studio User Interface

The basic building block for the user interface is a **View** object created from the View class, occupies a rectangular area on the screen, and is responsible for drawing and event handling. The view is the base class for widgets, creating interactive UI components like buttons, text fields, etc.

The **ViewGroup** is a subclass of **View** and provides invisible containers that hold other Views or ViewGroups and define their layout properties.

At the third level, we have different layouts, which are subclasses of ViewGroup class, and a typical layout defines the visual structure for an Android user interface and can be created either at run time using **View/ViewGroup** objects, or you can declare your layout using simple XML file **main_layout.xml** which is located in the res/layout folder of your project.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

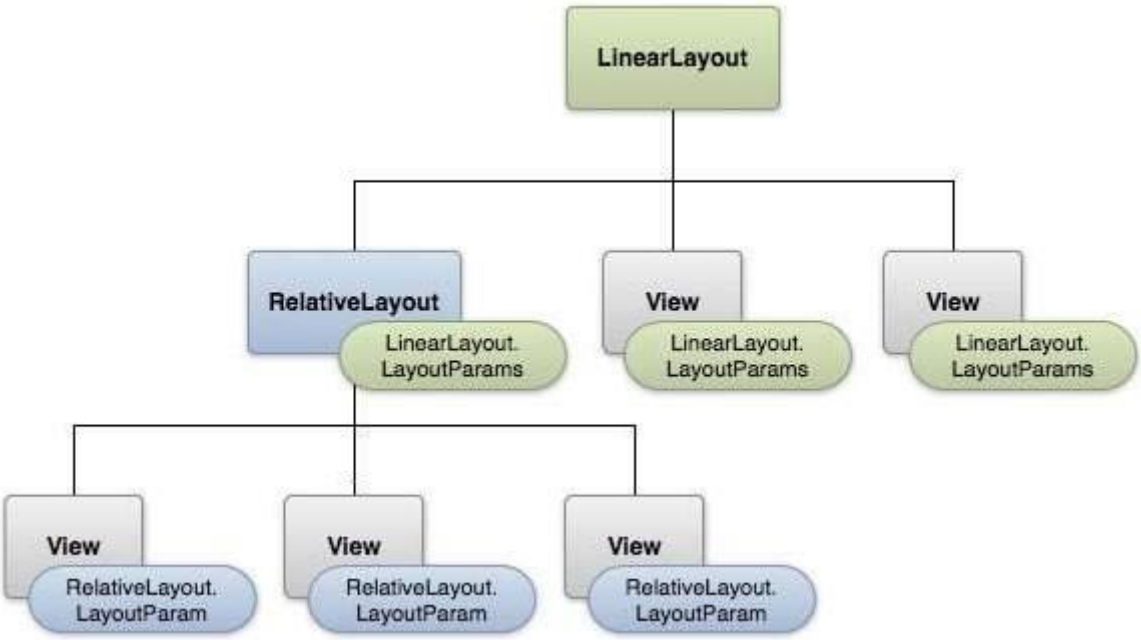

Figure 3-3 layout properties.

This tutorial is more about creating your GUI based on layouts defined in the XML file. A layout may contain widgets such as buttons, labels, text boxes, and so on. Following is a simple example of an XML file having a Linear Layout.

3.3.2.1 Android Studio- UI Controls

Input controls are the interactive components in your app's user interface. Android provides a wide variety of controls you can use in your UI, such as buttons, text fields, seek bars, check boxes, zoom buttons, toggle buttons, and many more.

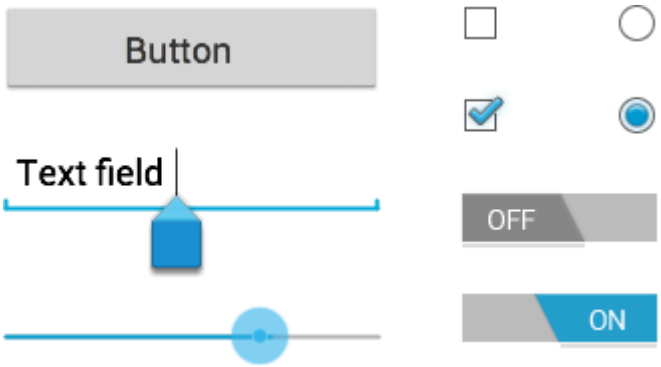

Figure 3-4 user interface to control

3.3.3 Android Studio Project Structure

Each project in Android Studio contains one or more modules with source code andresource files. Types of modules include:

- Android app modules
- Library modules
- Google App Engine modules

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

Android Studio default displays your project files in the Android project view, as shown inthe figure below.

Modules organize this view to provide quick access to your project's key source files.

All the build files are visible at the top level under **Gradle Scripts**, and each app module contains the following folders:

- **manifests**: Contains the AndroidManifest.xml file.
- **java**: Contains the Java source code files, including JUnit test code.
- **res**: Contains all non-code resources, such as XML layouts, UI strings, and bitmapimages.

3.3.4 Android Studio User Interface

The Android Studio main window comprises several logical areas in the figure below.

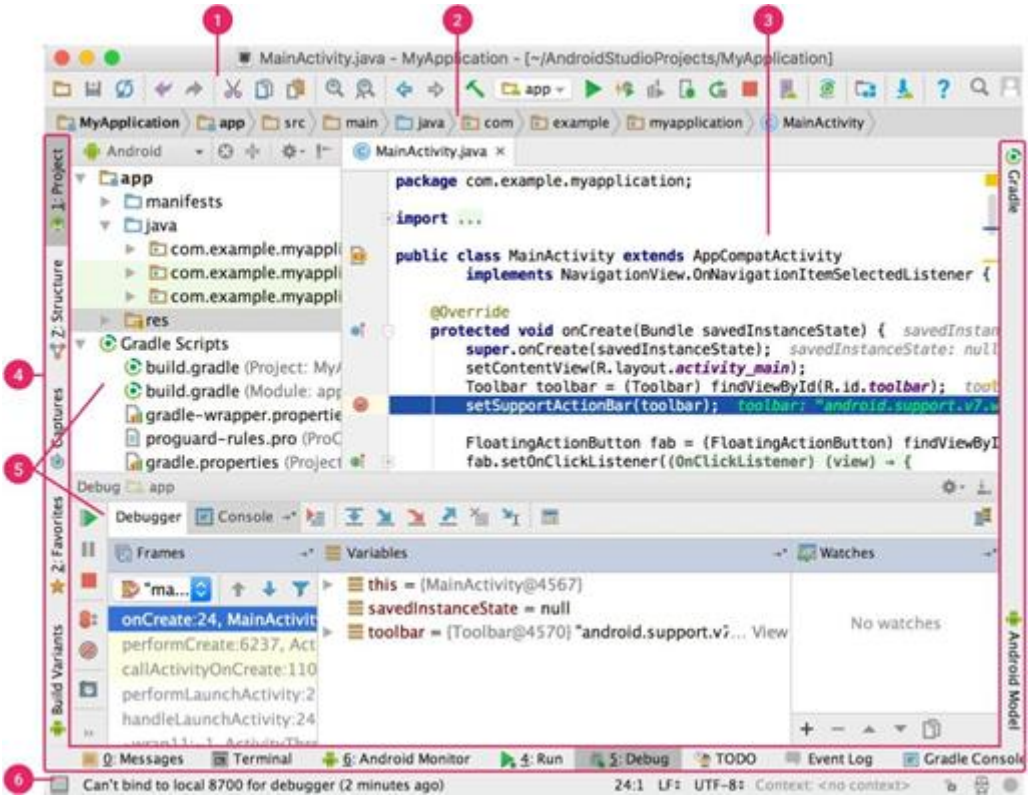

Figure 3-5 Android Interface

1. The **toolbar** lets you perform many actions, including running your app and launchingAndroid tools.
2. The **navigation bar** helps you navigate through your project and open files for editing.It provides a more compact view of the structure visible in the **Project** window.
3. The **editor window** is where you create and modify code. Depending on the currentfile type, the editor can change. For example, the editor displays the Layout Editor when viewing a layout file.
4. The **tool window bar** runs around the outside of the IDE window and contains thebuttons that allow you to expand or collapse individual tool windows.
5. The **tool windows** give you access to specific tasks like project management, search,version control, and more. You can expand them and collapse them.
6. The **status bar** displays the status of your project, the IDE itself, and any warnings ormessages.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

You can organize the main window to give yourself more screen space by hiding or moving toolbars and tool windows. You can also use keyboard shortcuts to access most IDE features. At any time, you can search across your source code, databases, actions, elements of the user interface, and so on by double-pressing the Shift key or clicking the magnifying glass in the upper right-hand corner of the Android Studio window. This can be very useful if, for example, you are trying to locate a particular IDE action that you have forgotten how to trigger.

CHAPTER 4 ANDROIDSTUDIO DESIGN AND SMIULATION

4.1 Activities Navigations

This chart is the basic flowchart map of the application, which shows the path of the application since its launch, Then the possibilities of logging in, and finally reaching the quiz.

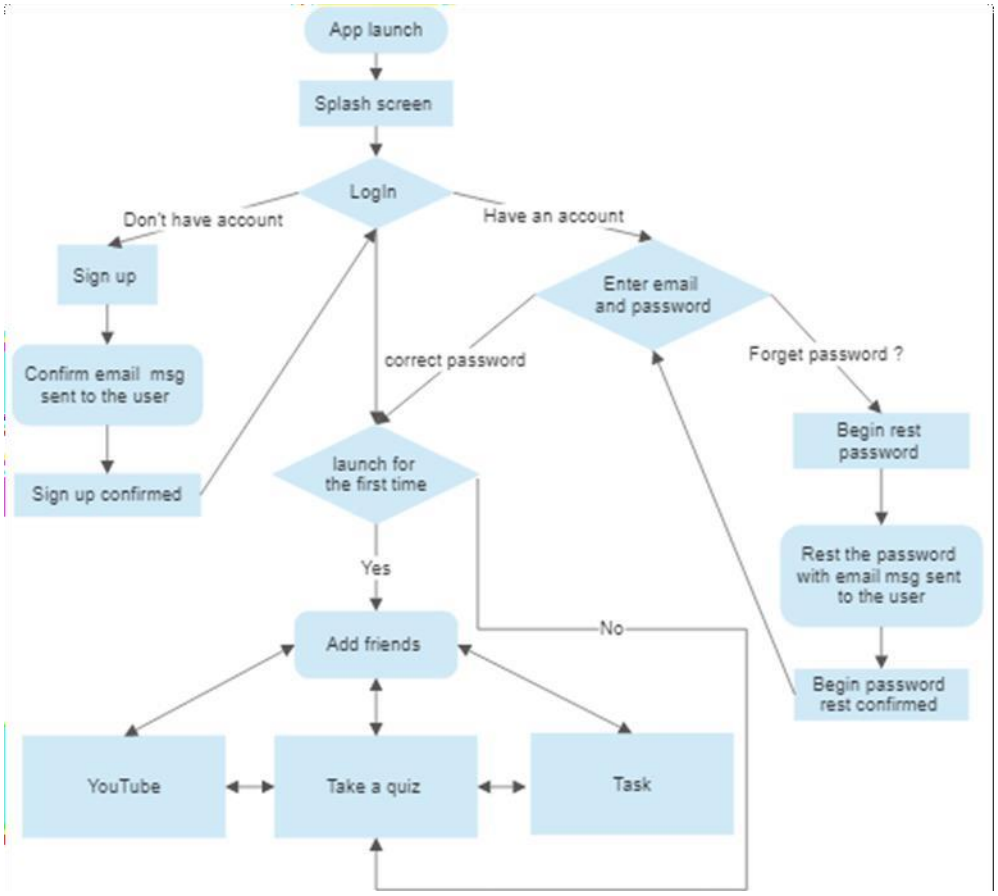

Figure 4-1application flowchart

4.2 Methodology

4.2.1 Smartphone Operating System Choosing

According to Gartner17, in the 3rd quarter of 2011, Android earned 52.5% market share, leading the smartphone sales market, while the market share of Symbian and iOS were 16.9% and 15.0% in the same period18 (Gartner, 2011). However, in the 3rd quarter of2010, Android only had 25.5% smartphone sales to end users, showing a fast growth of the Android OS market.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

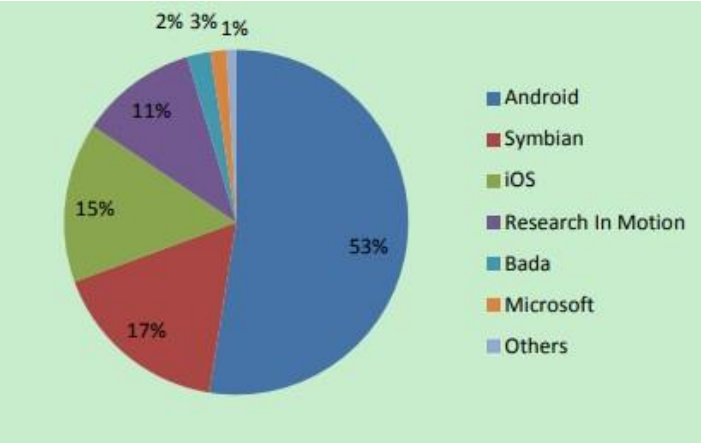

Figure 4-2 Operating system software

4.2.2 Android Activities

An activity is a fundamental android application component that provides the user a window containing the user interface of this application. Normally, one application has one or more activities loosely bound to each other, and among them, one activity is the main activity, the first after launching. One activity can start another one, and only one activitycan be on run mode. When the new activity starts, the previous activity is stopped. This is handled by a back stack, which constantly pushes the current running activity to the top of the stack.

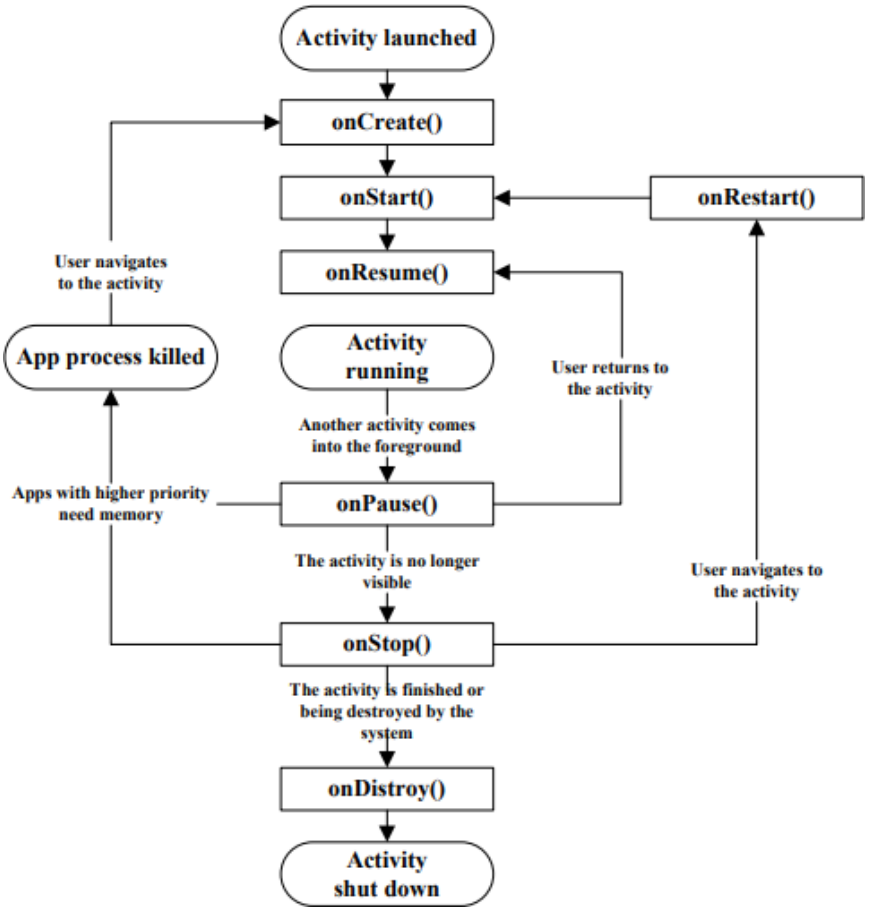

Figure 4-3 Android activity lifecycle

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

4.2.3 Popup Notification

The popup notification allows this mobile transformer monitoring application to inform the operator about the transformer alarm or warning event in time. When the application receives a new event, it first appears in the notification area at the top of the screen. After showing a quick rolling message, an icon of this notification resides in the notification area until the operator opens the notification drawer and checks the details of this event. By clicking on the notification in the notification drawer, the page turns to the event list activity, from which the operator can check all the current transformer's active events.

4.3 The Result

Have launched InTouch on several android devices, and it performed more thanperfectly. Showing us users' credentials on our firebase database cloud, the Test part previews the app working from initializing new users and verifying their Email addresses. Incase you forgot your password, we managed this by adding the Reset Password (link to the verified account allowing to initialize a new password) to the point that the user starts adding friends and answering quiz 10 questions.

4.3.1 Test

After installing the application on mobile phone

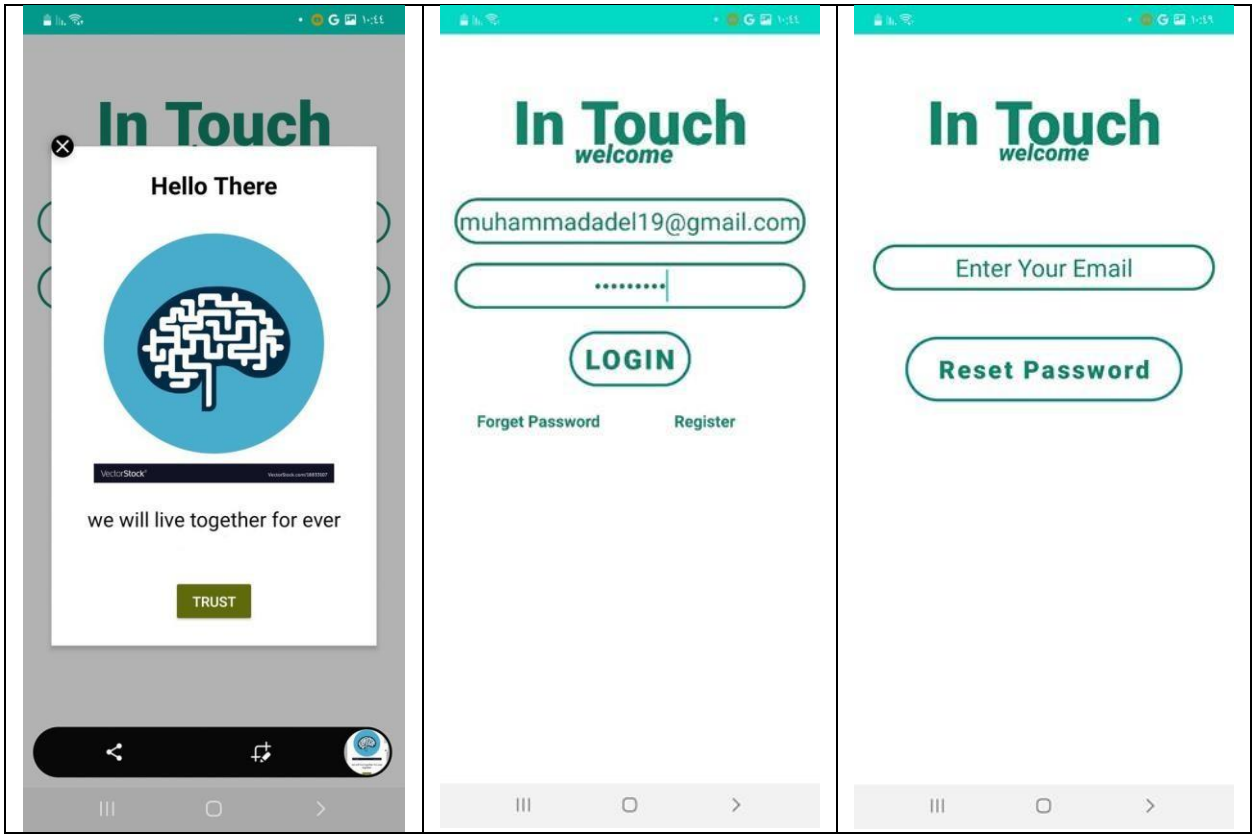

Figure 4-4Application running

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

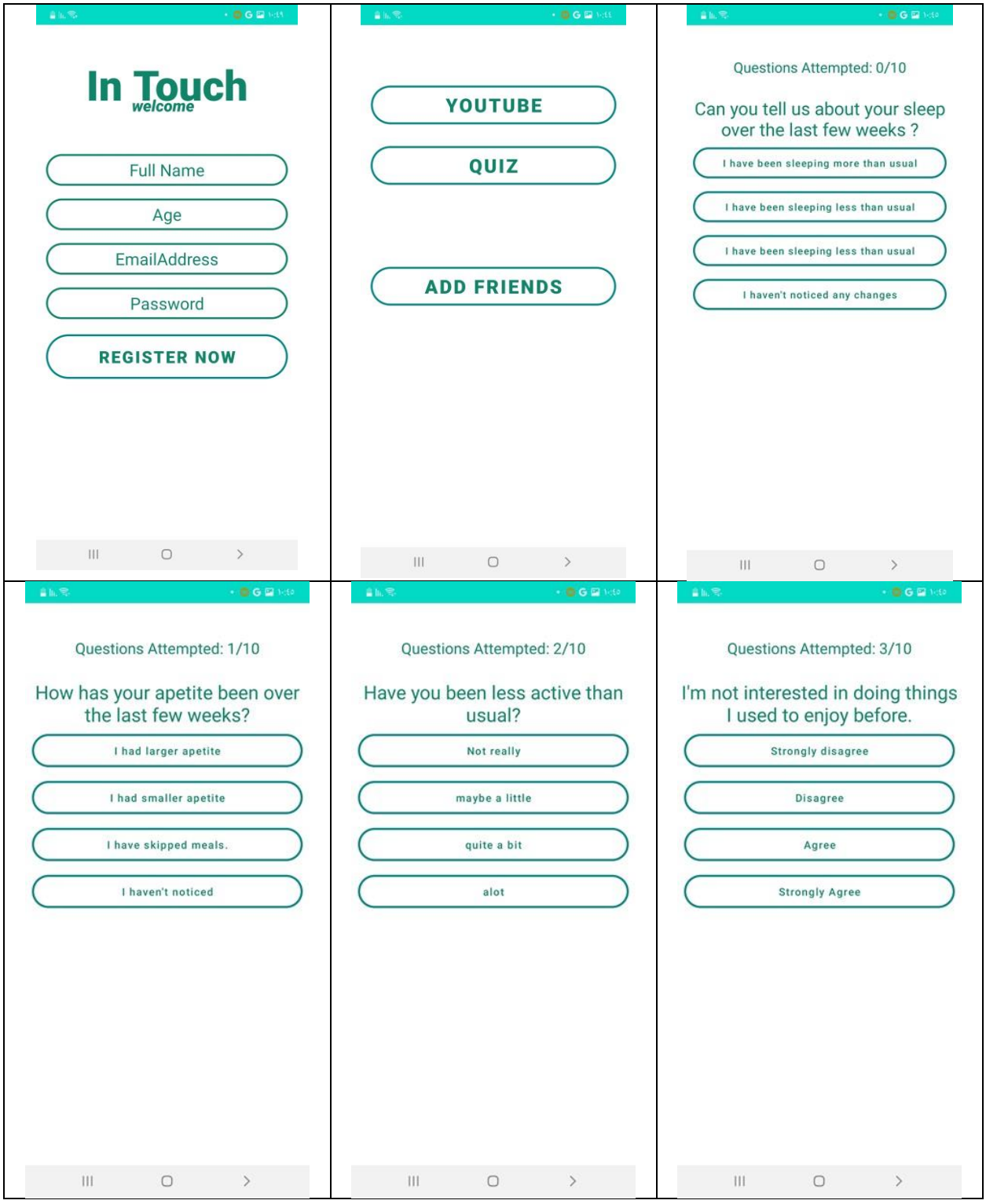

Figure 4-5 The mobile application

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

Figure 4-6 The mobile application

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

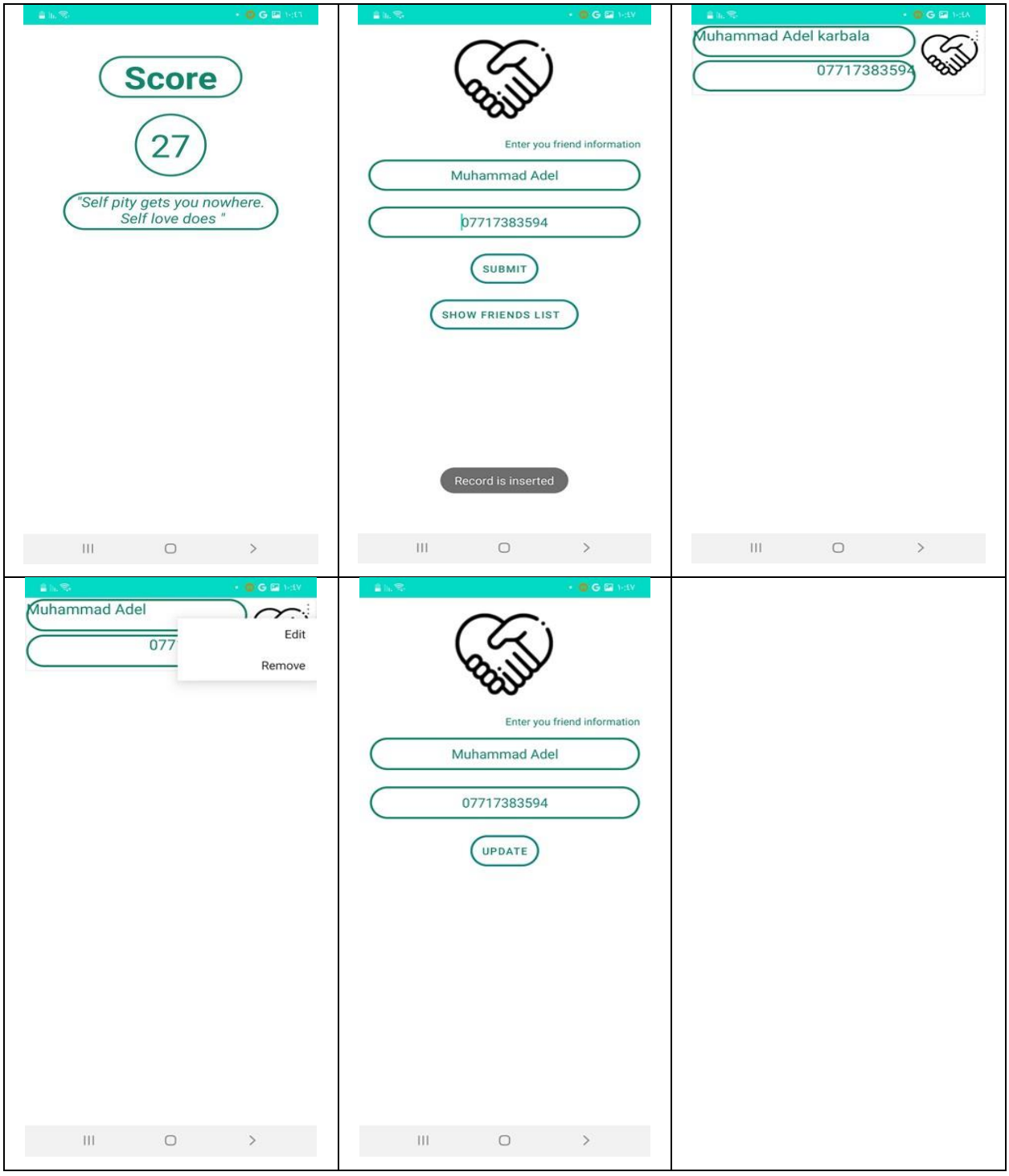

Figure 4-7 Mobile application

4.4 Discussion

The application was designed and implemented to fulfill the project's requirements in terms of reducing the rate of autism in terms of continuous communication with friends through the application by sending a notification to friends about predicting the user's feeling of loneliness.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

4.5 Conclusion

Built an innovative phone application to treat loneliness based on questions developedby psychiatry, and the treatment is classified into two methods. The first is a direct methodof sending messages to friends without the person's knowledge and asking them to help himby meeting him or calling him if they do not have time to meet. The second method is the indirect method, where the application sends pop-up messages to check out the person or suggest videos to be shown in cooperation with the YouTube applications algorithm.

4.6 Future Work

As future updates to the features of the application, we will add a conversations window, and these conversations will be of two types, the first is general conversations by random groups in order to spend time together and get acquainted, and the second type is private conversations between one of the people who add his account as a friend on our application platform.

References

1. "A. Dickens, S. Richards, C. Greaves, and J. Campbell, 'Interventions targetingsocial isolation in older people: a systematic review,' BMC Public Health, vol. 11, p. 647, 2011. - Google Search," .
2. C. M. Perissinotto, I. Stijacic Cenzer, and K. E. Covinsky, "Loneliness in older persons: A predictor of functional decline and death," *Arch. Intern. Med.*, vol. 172, no. 14, pp. 1078–1083, 2012, doi: 10.1001/archinternmed.2012.1993.
3. T. A. LaVeist, R. M. Sellers, K. A. Elliott Brown, and K. J. Nickerson, "Extreme social isolation, use of community-based senior support services, and mortality among African American elderly women," *Am. J. Community Psychol.*, vol. 25, no. 5, pp. 721–732, 1997, doi: 10.1023/A:1024643118894.
4. S. D'Mello, R. Picard, and A. Graesser, "Toward an affect-sensitive AutoTutor," *IEEE Intell. Syst.*, vol. 22, pp. 53–61, 2007.
5. J. Holt-Lunstad, T. B. Smith, M. Baker, T. Harris, and D. Stephenson, "Loneliness and Social Isolation as Risk Factors for Mortality: A Meta-Analytic Review," *Perspect. Psychol. Sci.*, vol. 10, no. 2, pp. 227–237, Mar. 2015, doi: 10.1177/1745691614568352.
6. J. Holt-Lunstad, T. B. Smith, and J. B. Layton, "Social relationships and mortality risk: A meta-analytic review," *PLoS Med.*, vol. 7, no. 7, p. 859, Jul. 2010, doi: 10.1371/journal.pmed.1000316.
7. N. K. Valtorta, M. Kanaan, S. Gilbody, S. Ronzi, and B. Hanratty, "Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematicreview and meta-analysis of longitudinal observational studies," *Heart*, vol. 102, no. 13, pp. 1009–1016, 2016.
8. L. C. Hawkley, R. A. Thisted, C. M. Masi, and J. T. Cacioppo, "Loneliness predicts increased blood pressure: 5-year cross-lagged analyses in middle-aged and olderadults," *Psychol. Aging*, vol. 25, p. 1, 2010.
9. L. Achterbergh, A. Pitman, M. Birken, E. Pearce, H. Sno, and S. Johnson, "The experience of loneliness among young people with depression: A qualitative meta- synthesis of the literature," *BMC Psychiatry*, vol. 20, no. 1, Aug. 2020, doi: 10.1186/S12888-020-02818-3.
10. G. C. on Brain Health, *The brain and social connectedness: GCBH recommendations on social engagement and brain health*. Retrieved fromwww.GlobalCouncilOnBrainHealth.org, 2017.
11. J. T. Cacioppo and S. Cacioppo, "Older adults reporting social isolation or loneliness show poorer cognitive function 4 years later," *Evid. Based. Nurs.*, vol. 17, no. 2, pp. 59–60, 2014.
12. H. O'Connell, A. V Chin, C. Cunningham, and B. A. Lawlor, "Recent developments: suicide in older

people," *Bmj*, vol. 329, no. 7471, pp. 895–899, 2004.

13. A. Shankar and others, "Social isolation and loneliness: Prospective associations with functional status in older adults," *Heal. Psychol.*, vol. 36, p. 2, 2017.
14. J. Holt-Lunstad, "The potential public health relevance of social isolation and loneliness: Prevalence, epidemiology, and risk factors," *Public Policy Aging Rep.*, vol. 27, no. 4, pp. 127–130, 2017.
15. J. T. Cacioppo *et al.*, "Loneliness and health: Potential mechanisms," *Psychosom. Med.*, vol. 64, no. 3, pp. 407–417, 2002.
16. T. W. Bickmore and J. Cassell, "Small Talk and Conversational Storytelling in Embodied Interface Agents," in *Proceedings of the AAAI Fall Symposium on Narrative Intelligence*, 1999, pp. 87–92.
17. J. Klein, Y. Moon, and R. W. Picard, "This computer responds to user frustration: Theory, design, and results," *Interact. Comput.*, vol. 14, no. 2, pp. 119–140, 2002, doi: 10.1016/S0953-5438(01)00053-4.
18. K. M. Colby, "A computer program using cognitive therapy to treat depressed patients," *Psychiatr. Serv.*, vol. 46, no. 12, pp. 1223–1225, 1995, doi: 10.1176/ps.46.12.1223.
19. M. M. Tugade and B. L. Fredrickson, "Resilient Individuals Use Positive Emotions to Bounce Back From Negative Emotional Experiences," 2004. doi: 10.1037/0022-3514.86.2.320.
20. M. Cesa-Bianchi, C. Cristini, and G. Cesa-Bianchi, "Positive aging," *Ric. di Psicol.*, vol. 27, no. 1, pp. 191–206, 2004, doi: 10.1300/j083v34n02_02.
21. J. Blumenthal, M. Babyak, and K. Moore, "and e. al, '*Effects of exercise training onolder patients with major depression,' Arch Intern Med, vol. 159," *p*, pp. 2349–2356, 1999.
22. "Social Isolation and Loneliness in Older Adults," *Soc. Isol. Loneliness Older Adults*, May 2020, doi: 10.17226/25663.
23. K. S. Rook and L. A. Peplau, "Perspectives on Helping the Lonely," in *Loneliness. A sourcebook of current theory, research and therapy*, L. Peplau and D. Perlman, Eds. New York: John Wiley & Sons, 1982, pp. 351–378.
24. K. Rook, "Loneliness," in *Encyclopaedia of psychology, Vol*, A. Kazdin, Ed. 5, 2000.
25. F. Fromm-Reichmann, "Loneliness," *Psychiatry*, vol. 22, pp. 1–15, 1959.
26. N. Medora and J. C. Woodward, "Loneliness among adolescent college students at a midwestern university.," *Adolescence*, vol. 21, no. 82, pp. 391–402, 1986.
27. C. Zilboorg, "Loneliness," *Atl. Mon.*, vol. 161, pp. 45–54, 1938.
28. R. Weiss, *No Title*. Loneliness: The experience of emotional and social isolation, 1973.
29. C. Moustakas, *Loneliness*. Englewood Cliffs, NJ: Prentice-Hall, 1961.
30. C. Rogers, *On Encounter Groups*. New York: Harper and Row, 1970.
31. C. A. Anderson and L. H. Arnoult, "Attributional Style and Everyday Problems in Living: Depression, Loneliness, and Shyness," *Soc. Cogn.*, vol. 3, no. 1, pp. 16–35, 1985, doi: 10.1521/soco.1985.3.1.16.
32. N. R. Schultz and D. Moore, "The Loneliness Experience of College Students," *Personal. Soc. Psychol. Bull.*, vol. 12, no. 1, pp. 111–119, 1986, doi: 10.1177/0146167286121011.
33. D. Brings, "Loneliness, perception of control, and health. (Doctoral dissertation," *Univ. Manitoba*, vol. 47, p. 1326, 1986.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

34. B. B. Hoglund, C. L. and Collison, "Loneliness and İrrational Beliefs Among CollegeStudents," *J. Coll. Stud. Dev.*, vol. 30, no. 30, pp. 53–58, 1989, [Online]. Available: https://psycnet.apa.org/record/1989-27645-001.

35. F. S. Archibald, K. Bartholomew, and R. Marx, "Loneliness in Early Adolescence: A Test of the Cognitive Discrepancy Model of Loneliness," *Personal. Soc. Psychol. Bull.*, vol. 21, no. 3, pp. 296–301, 1995, doi: 10.1177/0146167295213010.

36. K. S. Rook, "Toward a more differentiated view of loneliness.," in *Handbook of personal relationships: Theory, research and interventions.*, S. Duck, Ed. New York:Wiley, 1988, pp. 571–589.

37. J. de Jong-Gierveld, "Developing and Testing a Model of Loneliness," *J. Pers. Soc. Psychol.*, vol. 53, no. 1, pp. 119–128, 1987, doi: 10.1037/0022-3514.53.1.119.

38. W. H. Jones, S. A. Hobbs, and D. Hockenbury, "Loneliness and social skill deficits," *J. Pers. Soc. Psychol.*, vol. 42, no. 4, pp. 682–689, 1982, doi: 10.1037/0022- 3514.42.4.682.

39. D. Buhrmester, W. Furman, M. T. Wittenberg, and H. T. Reis, "Five Domains of Interpersonal Competence in Peer Relationships," *J. Pers. Soc. Psychol.*, vol. 55, no. 6, pp. 991–1008, 1988, doi: 10.1037/0022-3514.55.6.991.

40. C. Segrin, "Interpersonal communication problems associated with depression and loneliness," in *Handbook of Communication and Emotion*, P. A. Andersen and L. K. Guerrero, Eds. contexts (pp, 1996, pp. 215–242.

41. C. Killeen, "Loneliness: An epidemic in modern society," *J. Adv. Nurs.*, vol. 28, no.4, pp. 762–770, 1998, doi: 10.1046/j.1365-2648.1998.00703.x.

42. C. Y. K. Williams *et al.*, "Interventions to reduce social isolation and loneliness during COVID-19 physical distancing measures: A rapid systematic review," *PLoS One*, vol. 16, no. 2, p. e0247139, Feb. 2021, doi: 10.1371/JOURNAL.PONE.0247139.

43. Z. Kmietowicz, "Covid-19: Highest risk patients are asked to stay at home for 12 weeks," *BMJ*, vol. 368, p. m1170, Mar. 2020, doi: 10.1136/bmj.m1170.

44. G. Iacobucci, "Covid-19: UK lockdown is 'crucial' to saving lives, say doctors and scientists," *BMJ*, vol. 368, p. m1204, Mar. 2020, doi: 10.1136/bmj.m1204.

45. M. K. Looi, "Covid-19: Is a second wave hitting Europe?," *BMJ*, vol. 371, Oct. 2020, doi: 10.1136/bmj.m4113.

46. E. Mahase, "Covid-19: Harshest restrictions are imposed on Greater Manchester after talks collapse," *BMJ*, vol. 371, p. m4084, Oct. 2020, doi: 10.1136/bmj.m4084.

47. C. Victor, S. Scambler, J. Bond, and A. Bowling, "Being alone in later life: Loneliness, social isolation and living alone," *Rev. Clin. Gerontol.*, vol. 10, no. 4, pp. 407–417, 2000, doi: 10.1017/S0959259800104101.

48. J. S. House, K. R. Landis, and D. Umberson, "Social relationships and health," *Science (80-.).*, vol. 241, no. 4865, pp. 540–545, 1988, doi: 10.1126/science.3399889.

49. J. Barth, S. Schneider, and R. Von Känel, "Lack of social support in the etiology and the prognosis of coronary heart disease: A systematic review and meta-analysis," *Psychosom. Med.*, vol. 72, no. 3, pp. 229–238, Apr. 2010, doi: 10.1097/PSY.0b013e3181d01611.

50. R. Havinghurst, "Ageing in western society. The social challenge of ageing." Croom Helm, 1978.

51. A. Hunt, "The Elderly at Home: a study of people aged 65 and over living in the community in England in 1976." HMSO, 1978.
52. G. C. Wenger, R. Davies, S. Shahtahmasebi, and A. Scott, "Social isolation and loneliness in old age: Review and model refinement," *Ageing Soc.*, vol. 16, no. 3, pp. 333–358, 1996, doi: 10.1017/S0144686X00003457.
53. M. F. Lowenthal and B. Robinson, "Social Networks and Isolation," *Handb. Aging Soc. Sci.*, vol. 5, pp. 432–456, 1976.
54. R. Hadley and A. L. Webb, "Loneliness, social isolation and old people: some implications for social policy." 1974.
55. G. C. Wenger and V. Burholt, "Changes in Levels of Social Isolation and Loneliness among Older People in a Rural Area: A Twenty–Year Longitudinal Study," *Can. J. Aging / La Rev. Can. du Vieil.*, vol. 23, no. 2, pp. 115–127, 2004, doi: 10.1353/cja.2004.0028.
56. L. M. Heinrich and E. Gullone, "The clinical significance of loneliness: A literature review," *Clin. Psychol. Rev.*, vol. 26, no. 6, pp. 695–718, Oct. 2006, doi: 10.1016/j.cpr.2006.04.002.
57. C. Ó. Luanaigh and B. A. Lawlor, "Loneliness and the health of older people," *Int. J. Geriatr. Psychiatry*, vol. 23, no. 12, pp. 1213–1221, 2008, doi: 10.1002/gps.2054.
58. N. K. Valtorta, M. Kanaan, S. Gilbody, and B. Hanratty, "Loneliness, social isolation and social relationships: What are we measuring? A novel framework for classifying and comparing tools," *BMJ Open*, vol. 6, no. 4, 2016, doi: 10.1136/bmjopen-2015- 010799.
59. L. C. Hawkley and J. T. Cacioppo, "Loneliness and pathways to disease," *Brain. Behav. Immun.*, vol. 17, no. 1 SUPPL., pp. 98–105, 2003, doi: 10.1016/S0889-1591(02)00073-9.
60. D. A. West, R. Kellner, and M. Moore-West, "The effects of loneliness: A review of the literature," *Compr. Psychiatry*, vol. 27, no. 4, pp. 351–363, 1986, doi: 10.1016/0010-440X(86)90011-8.
61. F. Murphy, "Loneliness: a challenge for nurses caring for older people.," *Nurs. Older People*, vol. 18, no. 5, pp. 22–25, 2006, doi: 10.7748/nop2006.06.18.5.22.c2424.
62. L. C. Hawkley and J. T. Cacioppo, "Loneliness matters: A theoretical and empirical review of consequences and mechanisms," *Ann. Behav. Med.*, vol. 40, no. 2, pp. 218– 227, Oct. 2010, doi: 10.1007/S12160-010-9210-8.
63. W. Lauder, K. Mummery, M. Jones, and C. Caperchione, "A comparison of health behaviours in lonely and non-lonely populations," *Psychol. Heal. Med.*, vol. 11, no. 2, pp. 233–245, May 2006, doi: 10.1080/13548500500266607.
64. I. Åkerlind and J. O. Hörnquist, "Loneliness and alcohol abuse: A review of evidences of an interplay," *Soc. Sci. Med.*, vol. 34, no. 4, pp. 405–414, 1992, doi: 10.1016/0277-9536(92)90300-F.
65. F. Pels and J. Kleinert, "Loneliness and physical activity: A systematic review," *Int. Rev. Sport Exerc. Psychol.*, vol. 9, no. 1, pp. 231–260, Jan. 2016, doi: 10.1080/1750984X.2016.1177849.
66. E. Courtin and M. Knapp, "Social isolation, loneliness and health in old age: ascoping review," *Heal. Soc. Care Community*, vol. 25, no. 3, pp. 799–812, May 2017,doi: 10.1111/hsc.12311.
67. "Adobe Experience Design CC (Beta)," *www.adobe.com*, Accessed: Apr. 18, 2022. [Online]. Available: https://www.adobe.com/products/experience-design.experience- design-marquee-video.socialshare.html.

68. "IntelliJ IDEA: The Capable & Ergonomic Java IDE by JetBrains." https://www.jetbrains.com/idea/ (accessed Apr. 18, 2022).

69. E. Malinowski *et al.*, "Android Stuido," *Data Vault 2.0*, no. January 1999, pp. 1–15, 2019, doi: 10.1007/978-3-322-94873-1.

70. H. Schildt, *The complete reference Java*. 2020.

71. "Firebase Introduction - Javatpoint," *JavaTpoint*, 2018. .[72] "IJCSMC, Vol. 4, Issue. 4, April 2015, pg.882 – 885." .

72. K. Kharicha *et al.*, "What do older people experiencing loneliness think about primary care or community based interventions to reduce loneliness? A qualitative study in England," *Heal. Soc. Care Community*, vol. 25, no. 6, pp. 1733–1742, 2017, doi: 10.1111/hsc.12438.

73. G. M. Sandstrom and E. W. Dunn, "Social interactions and well-being: The surprising power of weak ties," *Personal. Soc. Psychol. Bull.*, vol. 40, no. 7, pp. 910– 922, Jul. 2014, doi: 10.1177/0146167214529799.

74. R. M. Page and G. E. Cole, "Demographic predictors of self-reported loneliness in adults.," *Psychol. Rep.*, vol. 68, no. 3 Pt 1, pp. 939–945, 1991, doi: 10.2466/pr0.1991.68.3.939.

75. S. Borys and D. Perlman, "Gender Differences in Loneliness," *Personal. Soc. Psychol. Bull.*, vol. 11, no. 1, pp. 63–74, 1985, doi: 10.1177/0146167285111006.

76. K. S. Rook, "Research on social support, loneliness, and social isolation: Toward an integration.," *Rev. Pers. Soc. Psychol.*, vol. 5, pp. 239–264, 1984.

77. P. Murphy and G. Kupshik, *Loneliness, stress and wellbeing: A helper's guide*. New York: Tavistock/Routledge, 1992.

78. S. F. Davis, H. Hanson, R. Edson, and C. Ziegler, "The relationship between optimism-pessimism, loneliness, and level of self-esteem in college students.," *Coll. Stud. J.*, vol. 26, no. 2, pp. 244–247, 1992.

79. W. H. Jones, B. N. Carpenter, and D. Quintana, "Personality and InterpersonalPredictors of Loneliness in Two Cultures," *J. Pers. Soc. Psychol.*, vol. 48, no. 6, pp. 1503–1511, 1985, doi: 10.1037/0022-3514.48.6.1503.

80. M. Kamath and S. Kanekar, "Loneliness, shyness, self-esteem, and extraversion," *J. Soc. Psychol.*, vol. 133, pp. 855–857, 1993.

81. R. F. Baumeister, H. T. Reis, and P. A. E. G. Delespaul, "Subjective and Experiential Correlates of Guilt in Daily Life," *Personal. Soc. Psychol. Bull.*, vol. 21, no. 12, pp. 1256–1268, 1995, doi: 10.1177/01461672952112002.

82. H. Cheng and A. Furnham, "Personality, peer relations, and self-confidence as predictors of happiness and loneliness," J. Adolesc., vol. 25, no. 3, pp. 327–339, 2002, doi: 10.1006/jado.2002.0475.

83. R. Riggio, K. Watring, and B. Throckmorton, "Social skills, social support, and psychosocial adjustment," Pers. Individ. Dif., vol. 15, pp. 275–280, 1993.

84. S. Duck, K. Pond, and G. Leatham, "Loneliness and the Evaluation of Relational Events," J. Soc. Pers. Relat., vol. 11, no. 2, pp. 253–276, 1994, doi: 10.1177/0265407594112006.

85. J. M. Ernst and J. T. Cacioppo, "Lonely hearts: Psychological perspectives on loneliness," Appl. Prev. Psychol., vol. 8, no. 1, pp. 1–22, 1999, doi: 10.1016/S0962- 1849(99)80008-0.

International Journal of Health Systems and Medical Sciences
ISSN: 2833-7433
Volume 03 Number 01 (January) 2024
Impact Factor: 10.87
SJIF (2023): 3.656
www.inter-publishing.com

86. J. G. Parker and S. R. Asher, “Friendship and Friendship Quality in Middle Childhood: Links With Peer Group Acceptance and Feelings of Loneliness and Social Dissatisfaction,” Dev. Psychol., vol. 29, no. 4, pp. 611–621, 1993, doi: 10.1037/0012-1649.29.4.611.

87. M. Hojat, “Psychometric Characteristics of the UCLA Loneliness Scale: A Study with Iranian College Students,” Educ. Psychol. Meas., vol. 42, no. 3, pp. 917–925, 1982, doi: 10.1177/001316448204200328.

88. D. Russell, L. A. Peplau, and C. E. Cutrona, “The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence,” J. Pers. Soc. Psychol., vol. 39, no. 3, pp. 472–480, 1980, doi: 10.1037/0022-3514.39.3.472.

89. D. H. Saklofske, R. A. Yackulic, and I. W. Kelly, “Personality and loneliness,” Pers. Individ. Dif., vol. 7, no. 6, pp. 899–901, 1986, doi: 10.1016/0191-8869(86)90091-7.

90. J. P. Stokes, “The Relation of Social Network and Individual Difference Variables to Loneliness,” J. Pers. Soc. Psychol., vol. 48, no. 4, pp. 981–990, 1985, doi: 10.1037/0022-3514.48.4.981.

91. D. H. Saklofske and R. A. Yackulic, “Personality predictors of loneliness,” Pers. Individ. Dif., vol. 10, no. 4, pp. 467–472, 1989, doi: 10.1016/0191-8869(89)90011-1.

92. V. J. Derlega and S. T. Margulis, “Why loneliness occurs: The interrelationship of social psychological and privacy concepts,” in Loneliness: A sourcebook o f current theory, research, and therapy, L. A. Peplau and D. Perlman, Eds. 152165). New York: John Wiley & Sons, 1982, pp. 152–165.

93. W. Jones, S. Hobbs, and D. Hockenbury, “Loneliness and social skill deficits,” J. Pers. Soc. Psychol., vol. 42, pp. 682–689, 1982.

94. C. E. Cutrona, “Transition to college: Loneliness and the process of social adjustment,” in Loneliness: A sourcebook of current theory, research, and therapy, L. Peplau and D. Perlman, Eds. New York: John Wiley & Sons, 1982, pp. 291–301.

95. E. Stephan, M. Fäth, and H. Lamm, “Loneliness As Related To Various Personality and Environmental Measures: Research With the German Adaptation of the Ucla Loneliness Scale,” Soc. Behav. Personal. an Int. J., vol. 16, no. 2, pp. 169–174, 2006, doi: 10.2224/sbp.1988.16.2.169.

96. J. G. Williams and C. H. Solano, “The Social Reality of Feeling Lonely,” *Personal. Soc. Psychol. Bull.*, vol. 9, no. 2, pp. 237–242, 1983, doi: 10.1177/0146167283092007.

97. D. W. Moore and N. R. Schultz, “Loneliness at adolescence: Correlates, attributions, and coping,” *J. Youth Adolesc.*, vol. 12, no. 2, pp. 95–100, 1983, doi: 10.1007/BF02088307.

98. W. H. Jones, J. Rose, and D. Russell, “Loneliness and Social Anxiety,” in *Handbook of Social and Evaluation Anxiety*, H. Leitenberg, Ed. New York, 1990, pp. 247–266.

99. W. H. Jones, J. E. Freemon, and R. A. Goswick, “The persistence of loneliness: Self and other determinants,” *J. Pers.*, vol. 49, no. 1, pp. 27–48, 1981, doi: 10.1111/j.1467-6494.1981.tb00844.x.

100. B. H. Spitzberg and H. T. Hurt, “The Relationship of Interpersonal Competence and Skills to Reported Loneliness Across Time,” *J. Soc. Behav. Pers.*, vol. 2, no. 2, pp. 157–172, 1987.

101. C. Segrin, “Effects of dysphoria and loneliness on social perceptual skills.,” *Percept. Mot. Skills*, vol. 77, no. 3 Pt 2, pp. 1315–1329, 1993, doi: 10.2466/pms.1993.77.3f.1315.

102. A. Rokach, “Theoretical approaches to loneliness: From a univariate to a multidimensional experience,” *Rev. Existent. Psychol. Psychiatry*, vol. 19, no. 2, pp.225–254, 1984, [Online]. Available:

http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc2&NEWS=N &AN=1988-32696-001.

103. D. Perlman, P. D, and L. A. Peplau, "Loneliness Research: a Survey of Empirical Findings," in *Preventing the harmful consequences of severe and persistent loneliness*, no. January 1984, L. Peplau and S. Goldston, Eds. Maryland: National Institute of Mental Health, 1973, pp. 13–46.

104. A. Rokach, "Antecedents of loneliness: A factorial analysis," *J. Psychol. Interdiscip.Appl.*, vol. 123, no. 4, pp. 369–384, 1989, doi: 10.1080/00223980.1989.10542992.

105. H. White *et al.*, "A randomized controlled trial of the psychosocial impact of providing internet training and access to older adults," *Aging Ment. Heal.*, vol. 6, no. 3, pp. 213–221, Aug. 2002, doi: 10.1080/13607860220142422.

106. R. A. Stebbins and D. M. Gaev, *The Psychology of Loneliness.*, vol. 6, no. 4.Columbus: Adams, 1977.

107. D. Damsteegt, "Loneliness, social provisions, and attitude," *Coll. Stud. J.*, vol. 26, pp.135–139, 1992.

108. L. A. Kraus, M. H. Davis, D. Bazzini, M. Church, and C. M. Kirchman, "Personal and Social Influences on Loneliness: The Mediating Effect of Social Provisions," *Soc. Psychol. Q.*, vol. 56, no. 1, p. 37, 1993, doi: 10.2307/2786644.

109. R. Weiss, "The Provisions of Social Relationships," in *Doing Unto Others*, Z. Rubin, Ed. Englewood Cliffs, NJ: Prentice-Hall, 1974, pp. 17–26.

110. A. Rokach and H. Brock, "Coping with loneliness," *J. Psychol. Interdiscip. Appl.*, vol. 132, no. 1, pp. 107–127, 1998, doi: 10.1080/00223989809599269.

111. P. R. Shaver and K. A. Brennan, "Measures of Depression and Loneliness," in*Measures of Personality and Social Psychological Attitudes*, J. Robinson and P.Shaver, Eds. San Diego: Academic Press, 1991, pp. 195–289.

112. P. Shaver, W. Furman, and D. Buhrmester, "Transition to College: Network Changes,Social skills, and Loneliness," in *Understanding personal relationships: An interdisciplinary approach*, S. Duck and D. Perlman, Eds. 193219). London: Sage, 1985, pp. 193–219.

113. M. Greene and B. L. Kaplan, "Aspects of Loneliness in the Therapeutic Situation," *Int. Rev. Psycho-Anal.*, vol. 5, pp. 330–532, 1978.

114. A. D. O. website, *No Title*. Best Practices for Testing [Online], 2014.

115. A. D. O. website, *No Title*. Setting Up Virtual Devices: Managing, 2014.