Virtual Reality against social isolation and loneliness

Introduction

Loneliness is a feeling that most people have experienced in their lives and are affected by in their lives [1]. It can be defined as: “a situation experienced by the individual as one where there is an unpleasant or inadmissible lack of (quality of) certain relationships” (De Jong Gierveld, 1987) [2]. Even before the COVID-19 pandemic loneliness was a global issue [1]. Nowadays, 9% of the Dutch population aged 15+ report feelings of loneliness frequently and 26% have that experience occasionally [3]. Single people and parents are more at risk than couples, however what is especially concerning is the fact that one third of the elderly people over 75 feel occasionally lonely and 9% even very often [3].

This is especially unfortunate since studies found out that: “Loneliness is a strong risk factor for the development of a number of health conditions, such as coronary heart diseases and strokes, and is associated with a 26% -50% increased risk in mortality” (Kasar & Karaman, 2021) [4]. Moreover, a professor of psychology and neuroscience at Brigham Young University claims that: “lack of social connection heightens health risks as much as smoking 15 cigarettes a day or having alcohol use disorder” (Novotney, 2020) [1]. Because of physical restrictions elderly people are more at risk of social isolation which is connected to loneliness. Additionally, the reduction of physical activity can lead to increased risk of illness and poorer well-being which then again leads to a risk in social isolation [5].

To conclude, the issue of loneliness is worse than is known by the public and should receive more attention and care. Therefore, our research and product hold great opportunities for the future and might significantly improve the life quality of elderly.

Global prevalence numbers

In 2022 the first EU-wide survey on loneliness was conducted by the European commission. The results showed that “13% of respondents report feeling lonely most or all of the time over the past four weeks, while 35% report being lonely at least some of the time” (*Loneliness Prevalence in the EU*, n.d.). Furthermore, this survey also showed that most people feel lonely in Ireland with a prevalence of 20% and the lowest numbers are found in the Czech Republic, Croatia, the Netherlands and Austria with below 10%. Countries like Bulgaria, Luxemburg and Bulgaria are in between with 16-18% [6]. Moreover, the European Commission reports that 75 million adults meet with family and friends at most once a month, however 30 million people admit feeling frequently lonely [7]. Additionally, they discovered evidence that contradicts the commonly held belief. The study indicates that adults in northern European (apart from Ireland) countries, such as Sweden, report lower levels of loneliness than those in southern Europe [8].

Research

To evaluate the impact of our product, we will employ a questionnaire as a pre-and post-intervention, such as the Positive and Negative Affect Schedule (PANAS), behavioral measurements, speech analysis, self-assessment Manikin (SAM) and Likert Scales.

PANAS is a self-report questionnaire designed to measure two distinct dimensions of mood: positive affect (PA), which reflects the extent to which a person feels enthusiastic and active, and negative affect (NA), which measures distress and unpleasurable emotions. It consists of 20 items, with 10 measuring PA (e.g., excited, inspired) and 10 measuring NA (e.g., upset, nervous), rated on a 5-point scale. PANAS is commonly used to assess emotional states over specific time frames, such as before and after interventions [9].

Additionally, to PANAS, we will gather additional insights based on the participant's behavior and communication during the VR experience. If participants speak during the session, we can analyze tone, volume, and pace of their speech as emotional indicators (e.g., excitement or anxiety) [10]. Observers will also monitor for signs of distracted behavior, such as shifting in their seat, removing the headset, or failing to react to key events in

the virtual environment [10]. Additionally, the Self-Assessment Manikin (SAM) will be used to visually assess three dimensions of emotional response: valence (pleasure), arousal, and dominance [11]. To further evaluate the user experience, feedback on the VR session will be gathered to measure user satisfaction, usability, and feelings of social inclusion. Additionally, the participants have the opportunity to discuss the events they have witnessed with other elderly people from the residency, should they have observed the same event.

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