**Slide 1**

Good morning everyone, I am Loftie Fourie and I am here to present my study on Serious Game Development for Dementia Care Using Preferred Music, Music Therapy.

**Slide 2**

This study was done to address the need for effective and engaging dementia care interventions through the development of a Music Therapy-Based Serious Game that integrates preferred music.

The aim of the study is to improve the quality of life for patients living with dementia.

Through the integration of preferred music, benefits such as long-term use, enhanced engagement, Memory stimulation and many more are included.

**Slide 3**

Through the use of the design science methodology a serious game, preferred music script and a controller were developed as artefacts for the study. The game was developed with simplicity and playability in mind while the preferred music script is used to analyze and dissect mp3 files to be used by the game. The controller will ensure physical and cognitive engagement as well as improve the game's ease of use.

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Key concepts for this study are:

Serious games, these are games with a primary purpose other than entertainment, usually for education, training, or other goals.

Music Therapy, This is the use of music to improve physical, emotional and mental well-being

Then lastly preferred music, this is music that is preferred or favored by a person, in this case, the patients.

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As previously mentioned, there are three artefacts. Tune Therapy is the game and it was developed in Godot where you use the drums or claps in music to play the game. Player-aimed motivational reassurance was also incorporated to encourage players to continue playing even when struggling. The game also allows players to upload their own songs and these songs are then sent to the preferred music script.

The Python script for preferred music dissects MP3 files to extract the percussive spectrograms. These spectrograms are then processed by a function that identifies the optimal frequency range to ensure the right number of beats are received for the game.

The controller was developed using raspberry Pis and designed to be used as a drum. These controllers are wireless as wires can be hazardous considering the target audience. The controller has 5 buttons, 1 for each player and a central button for the caretaker. Although they form part of one controller, each button can be handed out and are also connected to each other wirelessly. I know these aren’t perfect but I tried my best.

**Slide 6**

Here is a short demonstration of the game. It allows up to four players, each playing on the same screen but with different controllers and individual scores are also kept. Interventions that allow for more than one participant have shown to be more effective as the use of coercion to motivate participation is better than using persuasion. This game was designed to be an errorless game so players are not penalized if they miss a beat. This is to not discourage patients who struggle with the game from playing. The scores are kept but hidden, at certain time intervals a random player is selected, and their score is compared with the maximum score. The appropriate motivational reassurance is then played, directed at that player.

**Slide 7**

As I did not have the privilege of working with actual patients I gathered results through the use of an expert opinion. My artefact was reviewed by doctor Susan Coetzer, a Geriatrician and also Vice President of the South African geriatrics society. She rated a total of ten categories out of ten, each receiving high scores. The lowest received was accessibility with a score of 7, she elaborated that this is due to the limitations of care takers as uploading music will need training or assistance even if it is incorporated into the game. The next step in this study would be to use actual patients to test user acceptance and impact on patients.

**Slide 8**

In conclusion, patients benefits are enhanced through the integration of preferred music and long-term usability is promoted. The development of a user-friendly controller further ensures simplicity and understandability, thus increasing the accessibility and feasibility of this as an intervention for dementia patients.

Thank you all for your time