

Theme S1: Motivation to participate in research

A subtheme identified regarding the motivation to participate in a cognitive training intervention was the participants' past experiences of family illness. Participants made specific references to the cognitive deterioration of family members due to illnesses such as dementia and Alzheimer's and expressed concerns that this could happen to them. Directly linked to the worry associated with the experiences of family illness was the desire to improve brain health. Participants suggested that if cognitive training could potentially help prevent or slow the development of such diseases as dementia or Alzheimer's then they would be willing to try it. Another subtheme linked to the desire to improve brain health was improving diabetes research. Several participants expressed that they were happy to take part to help further enhance research into the side effects of diabetes such as cognitive impairment. Other subthemes identified that influenced motivation to participate was that the study offered something different to the participants' usual routine and was therefore viewed as an opportunity to get out of the house, experience new places, and meet new people.

Theme S2: Research Communication

Two subthemes were identified relating to the communication of research including understanding the aims and study processes, and the need for better communication. Most participants stated that they understood the aims of the study and found the study processes easy to understand and coordinate. However, several participants stated that they did not initially fully understand the aims and study processes and that the researcher could have made them clearer. In addition to this, some participants were also surprised to learn that the study was not a discrete session and in fact a 6-week intervention, further highlighting the need for clarity of communication with respect to the study aims and processes.

Theme S3: Feelings about the research

Eight subthemes were identified in the context of the participants' feelings about the research. Apprehension, nervousness, worried about brain health, and not knowing what to expect were common feelings expressed by participants prior to the study. Other participants felt relaxed and intrigued, in addition to feeling positive about taking part. No concerns were expressed by participants regarding the tasks of the assessment visit. Whilst the majority of participants stated that they were used to giving blood and found blood extraction acceptable as part of the study, a few did highlight their dislike towards needles and blood extraction but did recognise that it was important in the context of research. Those allocated to the cognitive training group found cognitive training enjoyable with some participants reporting improved confidence after taking part. Initially participants did describe training as frustrating, and it was suggested to be a shock to the system at first. However, it was suggested that this initial frustration motivated participants to perform better whilst some participants suggested that the repetitive nature of tasks made training easier as they could remember answers and knew what to expect. Those allocated to the cognitive training group were disappointed not to be able to take part in the cognitive training arm of the intervention. Participants felt that their motivation decreased throughout the trial as being a part of the control group made them feel as if they were not an integral part of the study. Consequently, these individuals suggested that greater involvement is needed for those allocated to the study control groups. Finally, the programme length, session duration, and frequency were found to be acceptable in the population with the majority of participants having no issues when conducting a cognitive training intervention lasting 6 weeks, with sessions performed 2 times a week lasting 60 minutes in duration.

Theme S4: Facilitators and barriers to cognitive training

Several subthemes regarding the facilitators and barriers of cognitive training in T2DM were identified. Retirement was identified as a prominent facilitator of training in which participants suggested that the study was easily managed and did not pose any burden because of the spare time associated with retirement. Short travel distances to and from the university in addition to working from home were also factors identified by participants as facilitators. Having to travel longer distances to the university in addition to managing training around work were considered barriers to training. It was also suggested that the university environment could be a barrier to training as some felt out of place in this environment. They also described finding it difficult navigating obstacles including students, stairs and directions. Providing an option for home or university training visits in addition to the timings of visits was perceived as beneficial as it provided flexibility; helping to overcome barriers such as travelling to the university, the university environment and work commitments. Other factors that were identified as barriers to

training included unavoidable commitments such as holidays and family illnesses that were suggested to disrupt the rhythm of training.

Theme S5: Delivery of training

Several subthemes emerged regarding the delivery of training, some focused on study participation experiences, and some considered alternative options for future cognitive training. The participants who preferred home training visits suggested that they felt more comfortable in their own environment and that they felt more relaxed not having to experience the obstacles associated with visiting the university. Home visits were also favoured by some participants because of the convenience associated with not having to travel to and from the university. University training visits were preferred by some participants as it was suggested that the university provided more of an academic environment that presented less distractions compared to home training visits. Linked to the motivation to participate, participants felt that the university training visits also presented an opportunity to get out the house, experience new environments, and meet new people. The concept of group training sessions was also discussed, some participants liked the idea because of the potential camaraderie, as well as being able to compare themselves to others. However, individual supervised training was also perceived as advantageous as it would enable greater concentration compared to a group setting, potentially leading to greater adherence. Participants also preferred individual supervised training because of the guidance with respect to explaining the tasks and support if something went wrong. The idea of a potential brain training app that participants could log into at home during their own time was also discussed. Whilst participants thought it may be advantageous to use on a phones or tablets, other participants suggested that adherence may become an issue, and that participants may become more distracted.

Theme S6: Desire to continue training

The final overarching theme identified was the desire to continue brain training in which a common subtheme identified was the continuation of training through the use of apps and puzzles at home. Participants discussed actively searching for training apps in addition to receiving brain training apps as gifts from family members. In addition, participants suggested that they had become more aware of their brain health as a result of brain training and have since recommended this type of training to friends and family. A factor that was shown to have played a role in the participants desire to continue training was the associated enjoyment. The enjoyment of cognitive training had already been identified as a subtheme regarding the participants' feelings towards cognitive training, and participants suggested that they wanted to continue because they enjoyed the training.