

2023 NATIONAL DESIGN PROJECT

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| Project Title | MemoRise |
| Theme | Social Wellness |
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PROJECT OVERVIEW

With numbers as high as 55 million people suffering from dementia and the world receiving around 10 million cases today, there is a rising need for the number of caregivers (World Health Organization: WHO & World Health Organization: WHO, 2023). With approximately more than 21,000 caregivers (Loh, 2023), it is no surprise that it is difficult for them to take care of the 92,000 people suffering from dementia in Singapore^[3]. Due to this, there may be consequences, such as psychological distress on the caregivers who are working round the clock to ensure that the patients are cared well (Janet, 2022). To reduce the 'burden' on caregivers, we can make their work easier through the use of technology.

This project aims to create an app that aids the caregivers in their daily tasks with features to enhance their abilities to serve their patients or clients or loved ones better. We hope that this will help to provide some form of support and relief, especially in reducing psychological stress. There are studies that list the negative consequences on the caregivers, such as physical and/or mental health deterioration. Using that as a guide, we hope to lighten their 'load' and thus, reduce the severity of these effects and improve quality of life through the app we plan to make.

RESEARCH FINDINGS

Around 1 in 10 Singaporeans aged 60 and above suffer from dementia. With only about 22% of the number of caretakers that make up the total number of patients suffering from dementia, there is certainly an understanding that there has been much of a burden put on the caregivers (Mungcal, n.d.). With symptoms such as slower processing (thinking), loss of focus and organisation, those who are caring for these patients have to ensure that they are extremely patient and fully engaged with the patients they are working with (Dementia - Symptoms and Causes - Mayo Clinic, 2023). As a result, caregivers who serve dementia patients may be at risk of developing mental health disorders such as anxiety, depression and grief-related illnesses, or burnout from physical and mental exhaustion.

The caregiving experience for caregivers is for them to juggle with their personal commitments, like work and family, and the daily caring and supervision of the patient with dementia. This can take an emotional and physical toll on the caregivers. In Singapore, research has shown that 1 in 2 family caregivers may suffer from depression^[7]. Such depression may be due to physical care demands, behavioural problems, lower caregiving competency and loss and grief. The caregivers' role includes supporting the physical dependency of the patient as the patients lose the ability to care for themselves with the progressive decline in comprehension and intellect. This means that caregivers have to manage the meals, medications and personal hygiene of the patients, as well as finances, appointments and major decisions which could affect the patient entirely. The large amount of work the caregivers undergo to take care of the dementia patients is a reason why they feel immense stress (Dementia Caregiving | SingHealth, n.d.).

PROPOSED SOLUTION

CURRENT SOLUTION

SUMMARY AND RATIONALE OF MEMORISE

Our proposed solution is an app called MemoRise which is used by the caregivers of dementia patients. Using Figma, we have created a prototype for MemoRise. Currently, MemoRise has 2 main functions: to monitor the well-being of the dementia patients and to take note of important information relevant to the dementia patient. The function of MemoRise is to reduce the amount of information that the caretaker has to remember. This will help to reduce the workload of caretakers, allowing them to feel less stressed out. Not only that, the app can help the caretakers focus on daily tasks like preparation of meals. This app can be used to track multiple patients at once simultaneously.

APP FUNCTIONS

Firstly, the login page is where the users, the caretakers, can sign in to the app. After signing in, the caretakers will be directed to the home page.

The home page has buttons to access the functions of the app.

The buttons are:

1. Schedule
2. Reminders
3. Helpline
4. Settings
5. Monitor Health

1. Schedule:

Schedule allows the caretaker to note down dates of appointments and events that the patient has to go for, reducing the amount of things the caretaker has to remember. The caretaker can see dates of past appointments and the dates of upcoming appointments. The caretakers can take note of the time and place of which the event is happening. They can click on 'Add date' to add new dates of upcoming appointments or events.

2. Reminders:

Reminders allow the caretaker to note important information relevant to the dementia patient. They will be reminded to give their patients the prescribed medication at a specific time or the time and location of an appointment/event. The caretakers can set reminders for other daily tasks as well. This way, caretakers need not remember too much information and will not feel stressed out.

3. Helpline:

The helpline button allows caretakers to have access to various important numbers such as the number of a close relative or the hotline of a clinic. Caretakers will not have to remember many numbers and will be able to find them easily in times of an emergency.

4. Settings:

Caretakers will be able to store their relevant information, like phone number and name of care centre, in settings. The caretakers will be able to change the language of the app to suit them, making the app easier to use.

5. Monitor Health:

Monitor Health allows caretakers to manage their patients. Caretakers can add their patients according to the number of patients they are taking care of. They will be able to take down the patients' health status. They can record the blood pressure, heart rate, the medication, whether they have taken medication and so on. This allows the caretakers to have access to the important information on their phone, making it more convenient to find and record information. The caretakers can add new columns with various new types of information to suit the needs of their patient.

APP DESIGN

Schedule Function

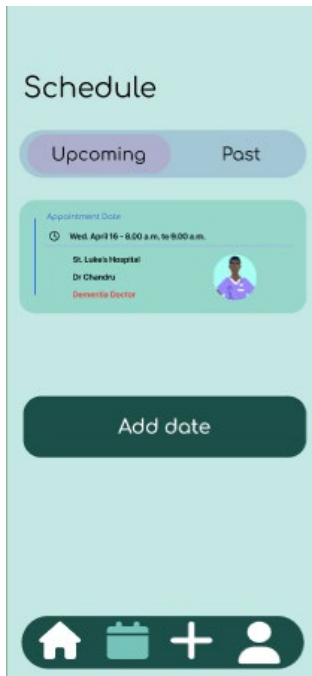


Fig. 3.1

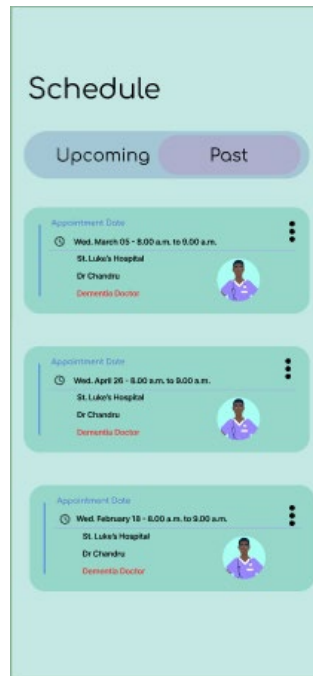


Fig. 3.1.1

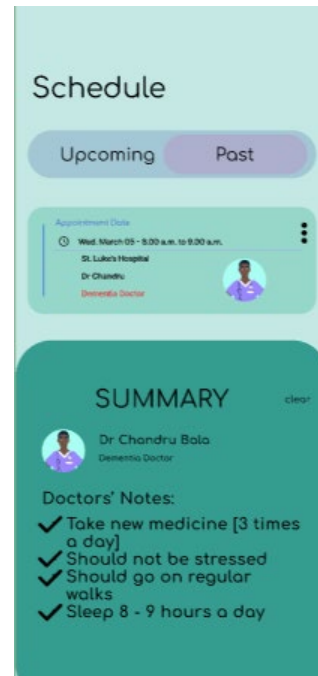


Fig. 3.1.1



Fig. 3.1.1.1



Fig. 3.1.1.2



Fig. 3.1.1.3

Reminder Function

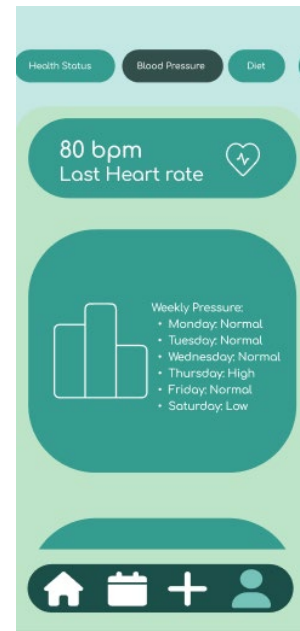
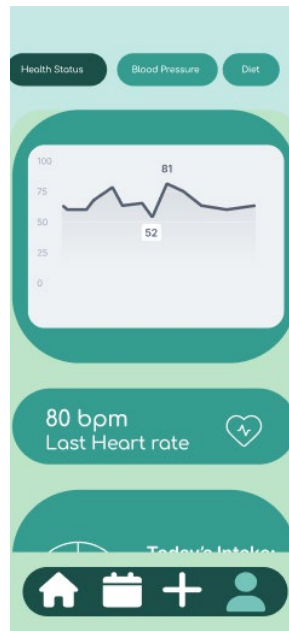
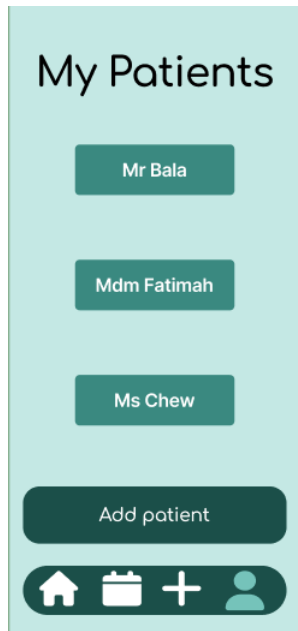


Fig. 1.1

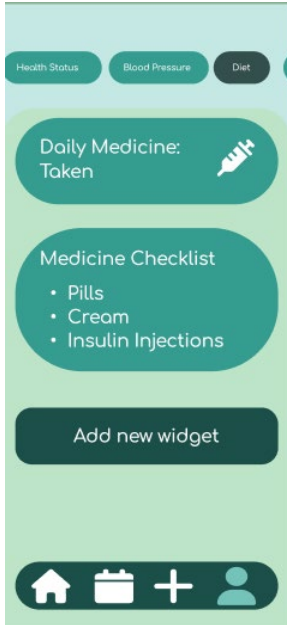


Fig. 1.3

Fig. 1.2

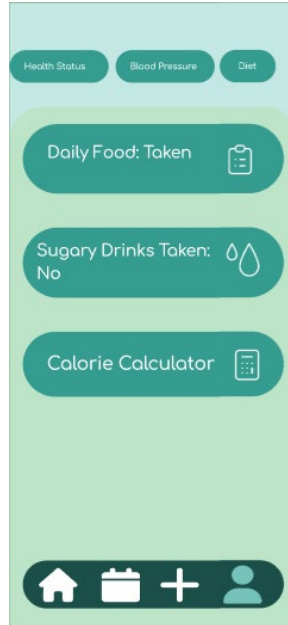


Fig.1.4

Fig. 1.3

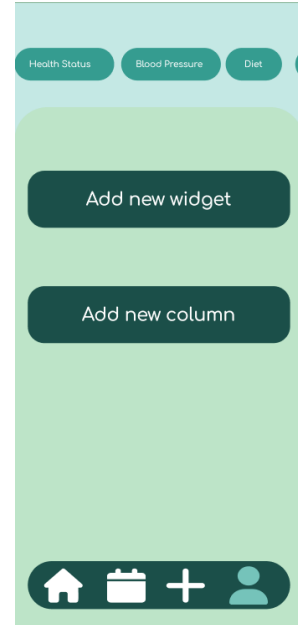


Fig. 1.5

Settings



Fig. 4.1

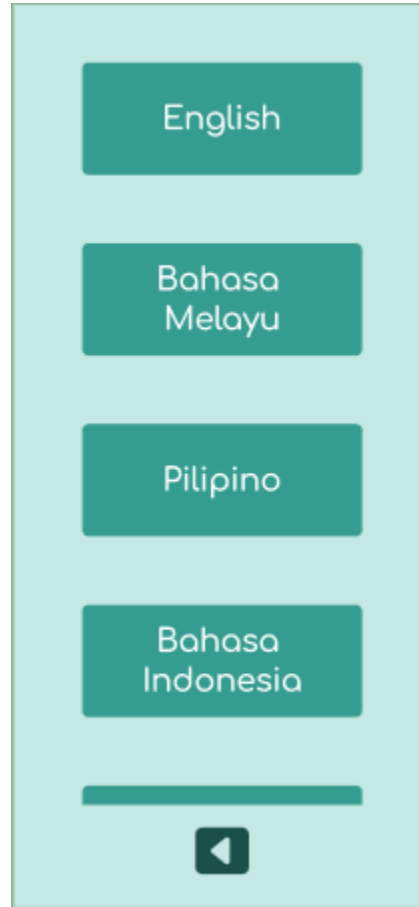


Fig. 4.2

LINK TO APP DESIGN

<https://www.figma.com/proto/hndSXV6xCyAcB7BvYFFAss/MemoRise?type=design&node-id=286-2&t=2Cc5gU6yvztotWM8-1&scaling=scale-down&page-id=282%3A2&starting-point-node-id=286%3A2&show-proto-sidebar=1&mode=design>

FUTURE IMPROVEMENTS

Currently, MemoRise is a prototype and it was done in a short amount of time. Thus, we feel that there is room for improvement. We feel that MemoRise could have more functions like memory games that can help the dementia patients decrease the rate of cognitive decline. By reducing the rate of cognitive decline, caretakers would not have as much work and it can keep dementia patients occupied. The app can be further improved by making it engaging for the dementia patients cognitively or by communicating with them. We feel that MemoRise can have a watch to go with the app as well. The watch will be worn by dementia patients and has the function of tracking the dementia patients' location and providing contact information of the caretaker if the patient gets lost. The watch can also be used as a device to measure the heart rate and blood pressure of the patient and send the data to the app, reducing the workload of caretakers. Another alternative is to link the app to an existing smart watch, reducing the cost of making special watches to go with the app. Interesting widgets can be added to make the app more appealing and fun for the user, attracting more caretakers to use the app. For example, on St. Patrick's Day, the app can have four leaf clover designs or images of leprechauns, making the app look fun for the caretakers. As MemoRise contains the confidential information of the dementia patients, we would like to make the app more secure against breaches and data theft. We feel that MemoRise could be linked to other networks that aim to enable caregivers to connect and share experiences or equip themselves with more knowledge on managing mental health conditions. Some networks include CARA Singapore.

REFERENCES

1. World Health Organization: WHO & World Health Organization: WHO. (2023). Dementia. *www.who.int*. <https://www.who.int/news-room/fact-sheets/detail/dementia#:~:text=Currently%20more%20than%2055%20million,injuries%20that%20affect%20the%20brain>.
2. Loh, R. (2023, July 6). The Big Read: With more seniors in Singapore needing care, is assisted living the answer? *CNA*. <https://www.channelnewsasia.com/singapore/big-read-ageing-population-more-seniors-needing-care-assisted-living-3599786>
3. Dementia Colabs. (n.d.). Full Report Dementia Colabs <https://cityofgood.sg/wp-content/uploads/2022/04/Dementia-Colabs-Public-Report-5-April-2022.pdf>.
4. Janet. (2022, July 20). The effects of dementia on family caregivers - FirstLight Home Care. *FirstLight Home Care*. <https://www.firstlighthomecare.com/blog/the-effects-of-dementia-on-family-caregivers/#:~:text=Levels%20of%20psychological%20distress%20are,time%20to%20their%20loved%20one>.
5. Mungcal, A. (n.d.). Living inside with dementia in Singapore: How a loving son created a dementia-friendly home for his dad | The Straits Times. *The Straits Times*. <https://www.straitstimes.com/multimedia/graphics/2022/09/dementia-singapore-home-care/index.html>

6. Mayo Clinic Staff, Dementia - Symptoms and causes - Mayo Clinic. (2023, June 22). Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/dementia/symptoms-causes/syc-20352013#:~:text=The%20most%20common%20symptoms%20of,Lewy%20body%20dementia.>
7. Unknown, Dementia caregiving | SingHealth. (n.d.-b). <https://www.healthxchange.sg/news/dementia-caregiving#:~:text=Dementia%20caregiving%20can%20not%20only,to%20help%20address%20this%20facet.>

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