Stroke Rehabilitation Application

Contents

1.Introduction

This Purpose of the application is to help the stroke patients lead a healthier life by providing them with a platform for recommending them exercises suited to them to narrow down the future chances of the strokes, helping them in their physical and psychological recovery. This app facilitates monitoring the performance and the improvement of the exercises performed by the patients. This app allows the user to set their own goals as in time to perform the exercise and/or the no. of the repetitions of the exercises helping the users progress at their own pace. Considering the user base may contain disabled people like blinds and deaf, training video has been provided for each recommended exercises to help them grasp the concept of those exercises easily. Free-play mode has been provided for the users who have never used this kind of app before to help them get familiar and develop a level of confidence before starting those recommended exercises, just to make their practice more effective and efficient. This app is designed to be multi-lingual to facilitate recovery for a larger audience with ease. I took some ideas from the app "Strokemark" to make the app a bit more customizable to suit as per users' requirements.

2.Usability Goals and Design Principles

All six of the useability goals have been tried to meet while designing this application to make the app more useful and useable. The interface from the landing page to the respective others have been made simple to move around, making it very learnable from the very first use.

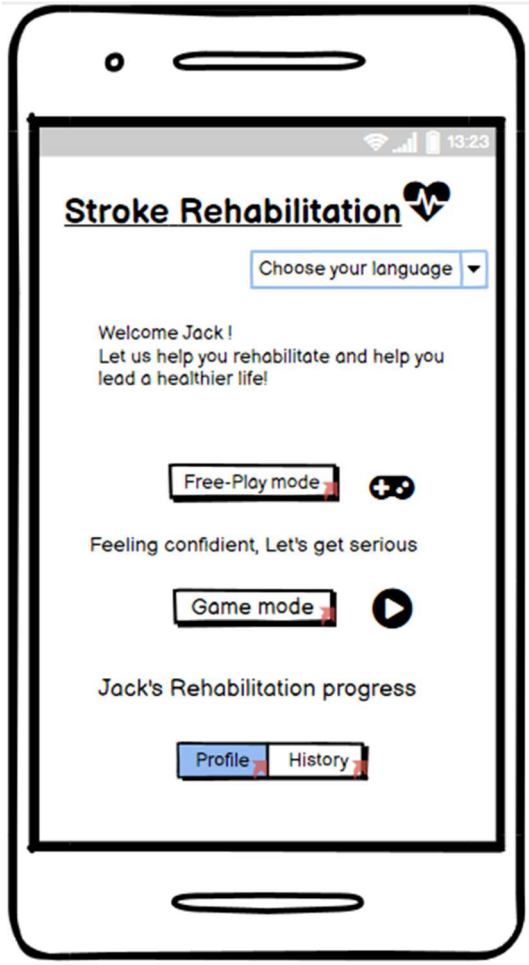

Figure 1: Main page

All buttons are left with brief descriptions on what actions they lead to when pressed. So, doesn't even take repeated use to be memorable of the functionalities that the app features. At places, popover comments have been left for the users considering if they run into any problems when trying out the functionalities. Simple yet effective interfaces have been designed as in this prototype making it easier to try out the functionalities this app features without running into any confusion and moreover, at places where a lot of options are made available for the users, help option has been added with comments on what and how to properly use those features. So, using this app is easy, simple, and fast proving it to be an efficient design. And talking about failure resistant, at every button pressed, the users are alerted with pop ups on whether they want to continue with that option making them think twice before committing to anything.

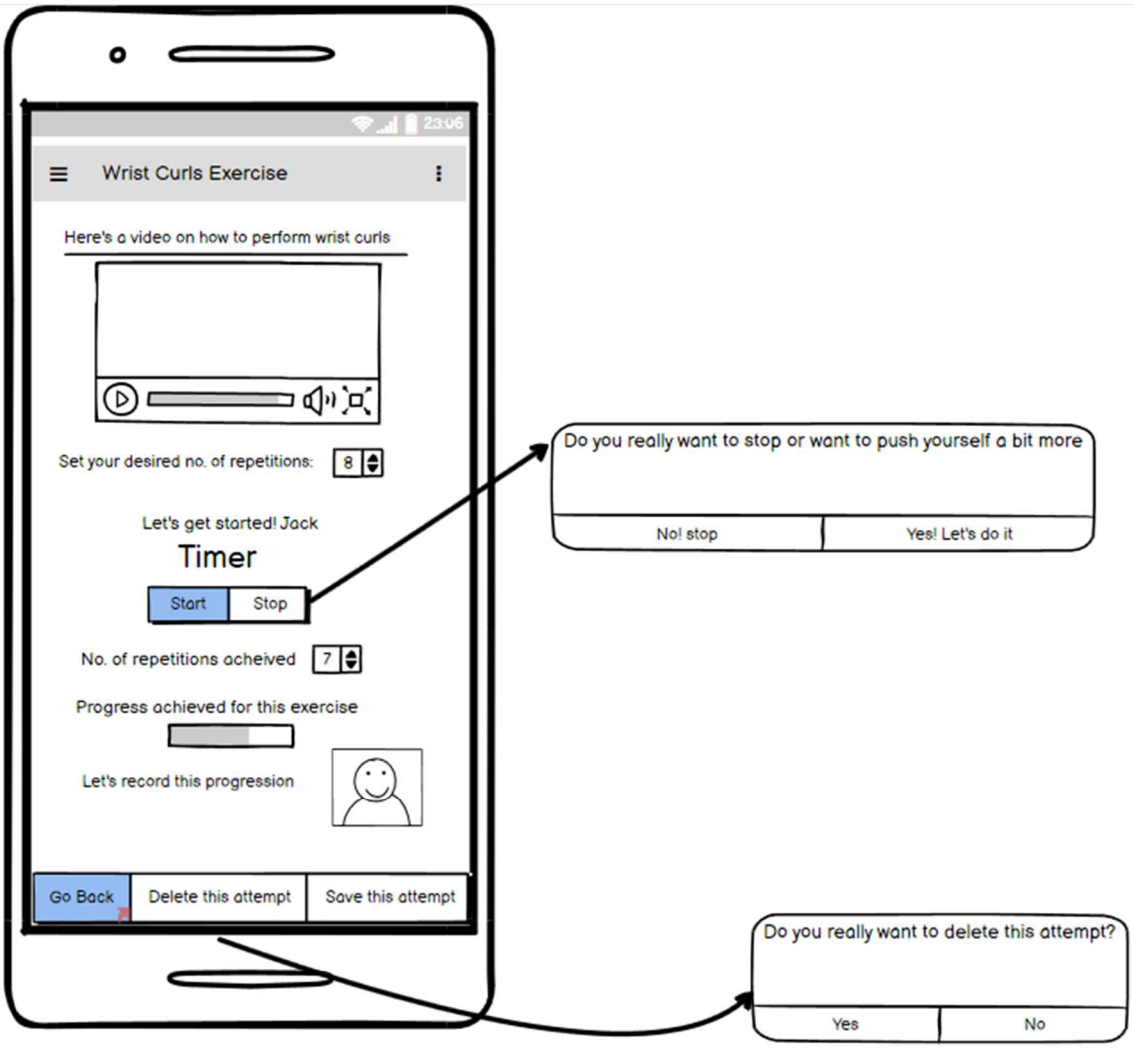

Figure 2: alert boxes in interface

And even if they went with that option, the interface is designed to provide them with the option of going back making the changes reversible. So, the prototype is designed to be forgiving in nature as if any improper use can be easily recovered and reversed. And finally, the interface has received the feedback of being enjoyable to use, satisfying as it does the work that it is supposed to do in an efficient and effective manner.

Almost all the Don Norman's design principles have been taken into consideration while designing this app interfaces. Mainly visibility and feedback have been implemented to a great extend to familiarize the users with the interface and the different functionalities it features, ensuring the users won't run into any problems while moving around or using the different features. Through using links, the different states of the app have been presented on how it changes after certain button are pressed. Some buttons are left selected and focused showing users on what action has been performed and the changes it caused afterwards. Consistency has been maintained throughout the design phase of this app by designing all the app interfaces to be of similar type and using similar kind of approach to engaging users. Moreover, the structure of the interfaces, button sizes, button types, their operations have been designed to be very similar to ensure that the users don't get confused. Users are restricted to certain kind of interactions like they won't be able to select multiple buttons at once where they are supposed to just select one and go forward with it. Furthermore, they are restricted to select only one of their preferred languages to get started with the app in the landing page. Mapping has been incorporated in the design making use of number stepper and the progress bar. The number stepper control is clear as it shows the user that while moving up the stepper, the number increases and while moving down, the number decreases.

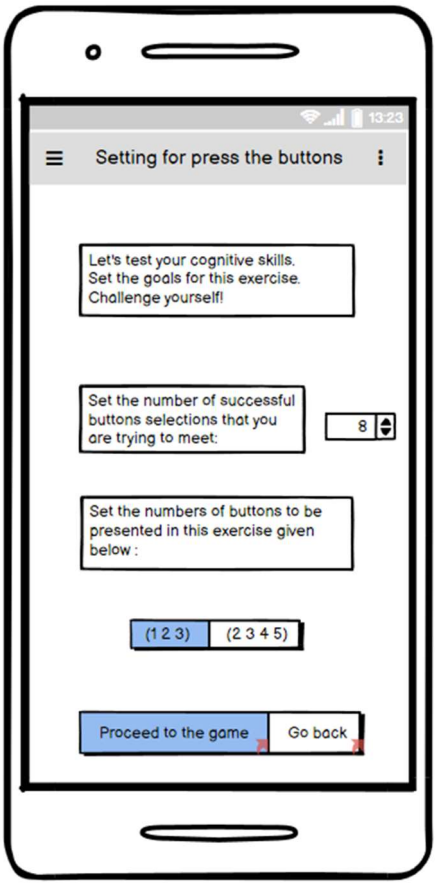

Figure 3: interface facilitating number stepper

Likewise, the progress bar as well clearly shows while the bar goes on filling, the progress being made. Affordance refers to an attribute of an object that allows people to know how to use it. (Sachin Rekhi, 2017) Affordance has also been tried to be met by providing various brief messages on how to use or go with provided options through out the interfaces. It has been made really clear on how to use the buttons, number steppers etc. through those brief descriptions provided. Overall, all the principles are tried to be met to a certain degree to make this prototype design more visually appealing and to make its useability more senseful to the users.

3.Testing Methodology

For testing my prototype, during the first tutorial session, I approached a couple of fellow friends from that session to have a look at my prototype. They were kind of biased to providing only the good points about the good parts as they knew me, and they were pretty much familiar with the design as well. So, to remove this bias, I chose students enrolled in IT units randomly and met them and showed them my design work and asked for feedbacks on how useable and useful this app looks and feels.

The testing took place physically in the campus study rooms, tutorial rooms and used zoom for online platforms as well. I used the think aloud approach and recorded their feedbacks Artful think aloud requires providing the user not only with the product to be tested, but with a series of tasks to complete and to verbalize their thoughts as they explore and attempt to achieve the goal. (blog.unguess.io, n.d.) Firstly, I let them know the theme of this design and the requirements that this design is to meet, then onwards let them play around with the design interface and noted down how easily they were able to use and/or explore the different functionalities that this design features. I used the following test tasks on the users and used the below provided success requirements to test how successful the design got.

Task1: James has accidently chosen the Free-Play mode, go back and choose the Game mode.

Task2: James has to view his last week's exercise progress.

Task3: James has successfully completed the press the buttons exercise and wants to save his attempt.

Task 4: James wants to change his display name with his desired alias name.

Following success requirements were checked if they were met by the app or not: -

Requirement1: User should be able to change to any of the playing mode at any time.

Requirement2: User should be able to view his weekly progress of each exercise.

Requirement3: User should be able to successfully save their exercise attempt.

Requirement4: User should be able to change their display name.

I did leave the users to finish the testing at their own pace and time. I let them move around the app features and noted down how long did different users take to familiarize them with the interface and finish the task. I furthermore noted down the extra feedbacks they provided on how the interface can be made more user-friendly just to get a rough idea on how the future prototypes should be designed. Overall, I would need to provide a little bit more time for the users to test the features and requirements, so they can take their time and come up with more practical feedbacks rather than speak out whatever comes to their mind first.

4.Testing Results and Discussions

The testing phase went well, and I got a couple of good feedbacks. Through the users, I came to know certain parts of the interface can be improved to better the user experience. One of the major one was that users couldn't track down their weekly progress of each exercise they performed over in the past weeks. The tested prototype design only facilitated displaying the current last saved exercise attempt and the total of the repetitions performed over the time. So, the test task 2 couldn't meet the successful requirement 2 proving the app isn't able to provide the features it should. So, to correct this, for each exercise history, I made the list of weeks to facilitate the weekly saved progress for viewing. I made buttons for these weeks so that users can press them to view their desired week's progress.

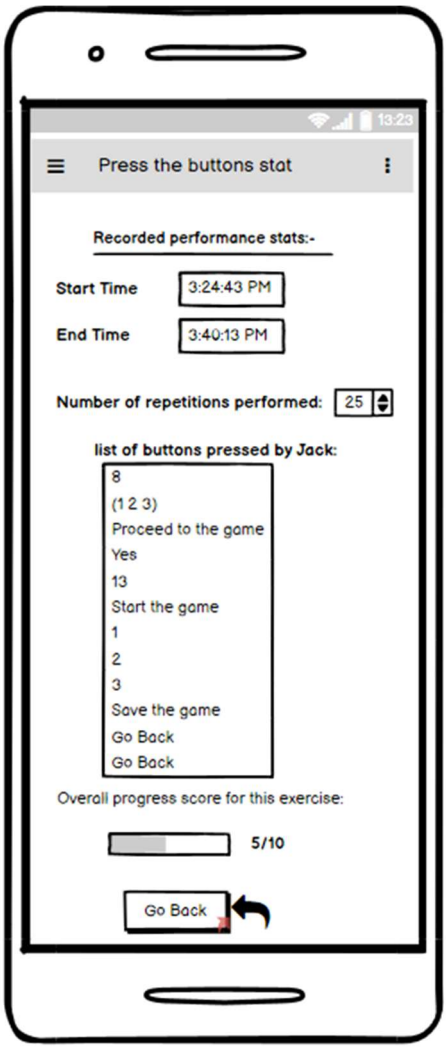

Figure 4.1: No weekly progress stat

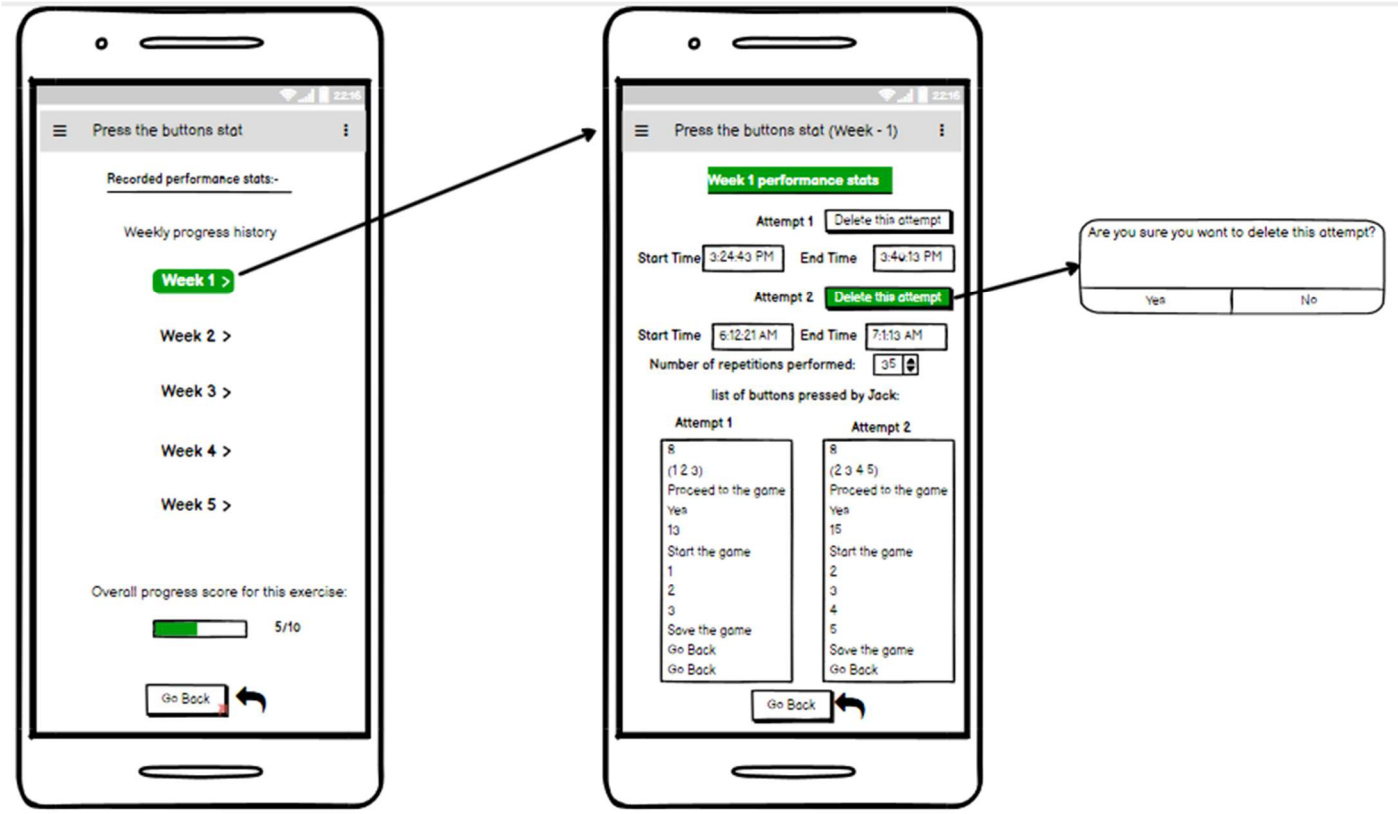

Figure 4.2: Changes made for weekly stats

Another feedback that I received was, the 'Press the buttons' exercise had a lot of customization and rules and can get confusing sometimes. So, to help the users with this, I added a 'need help' option with a clickable '?' icon that pops up a brief description on how the exercise works in step by step order.

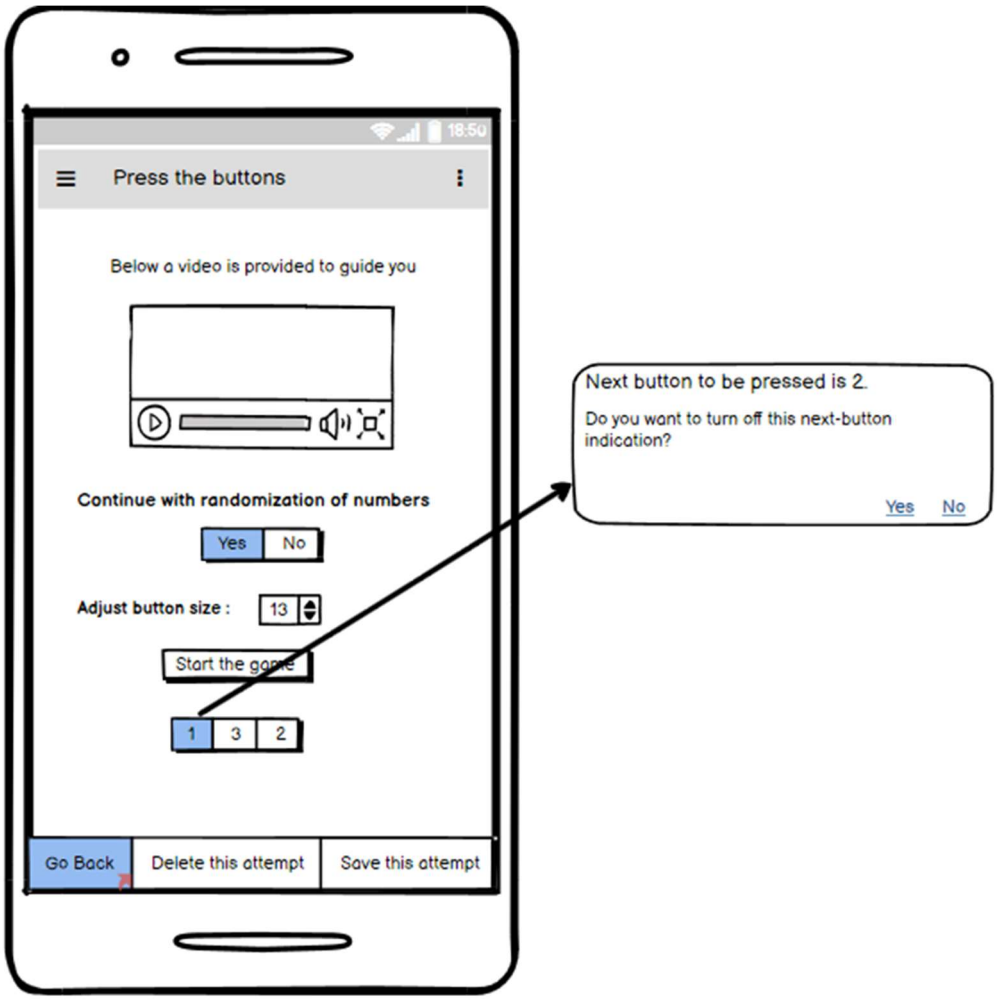

Figure 5.1: 'Press the button' interface

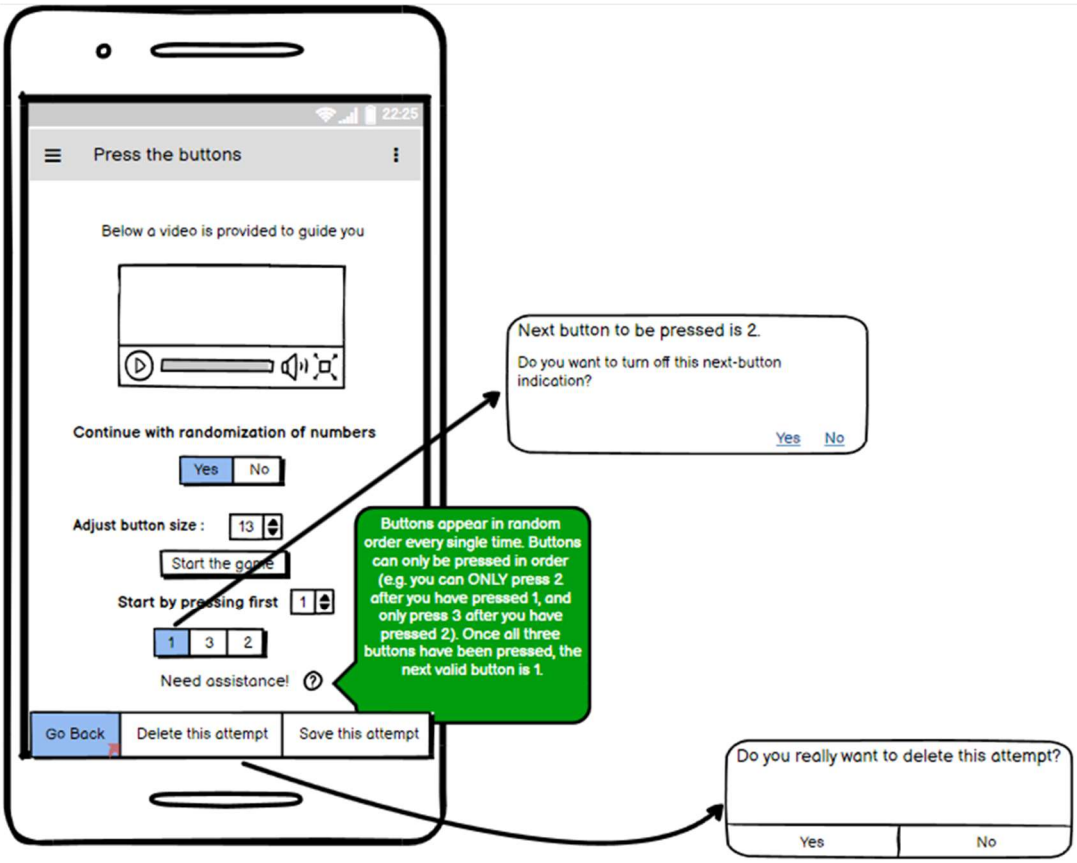

Figure 5.2: 'Press the buttons' updated interface

Furthermore, the last improvement that I got to know from the feedbacks was that whenever the user mistakenly pressed ‘delete the attempt’, there was no turning back meaning the app didn’t prove to be very failure-resistant and thus to correct that, I added an alert popup to confirm the users if they really wanted to delete their attempt.

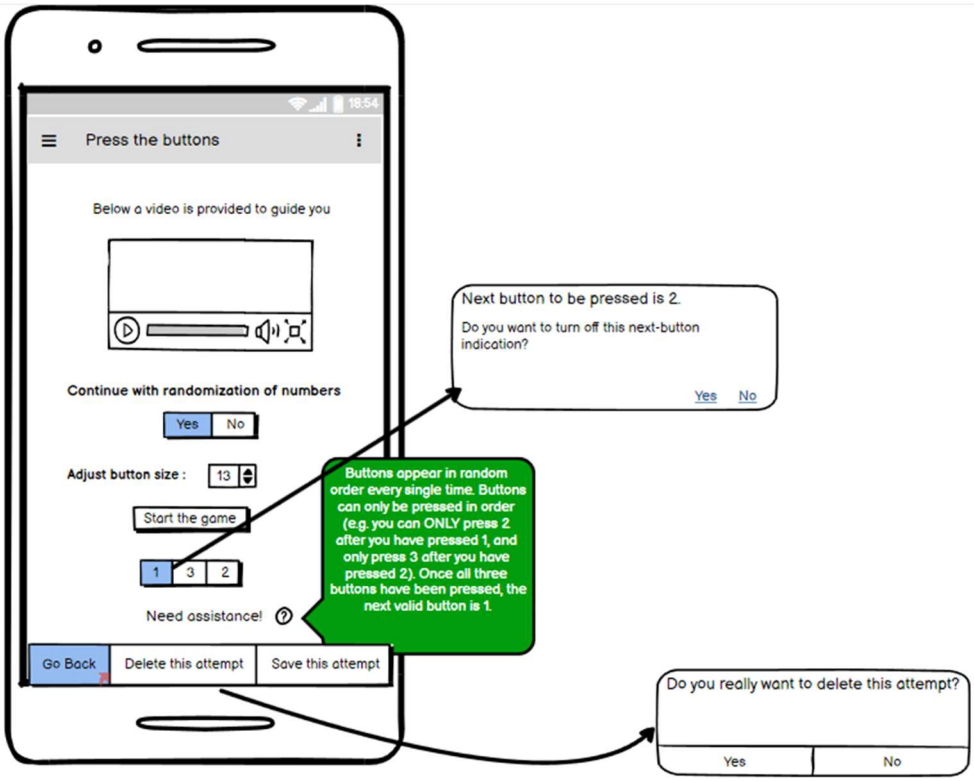

Figure 6: Updated 'press the button' interface with alert box

So, all the changes were made as per the feedbacks and the app now looks more user-friendly, failure-resistant, and easy to use. All the tests results that I gathered had been used to improve this app design. The tests data are presented below in the appendices section.

5.Conclusion

Through this iterative design process, the final design of the application has been completed to be an efficient and effective way to help the stroke patients in their recovery process. In this design process, I learned to make use of the design principles, methodology and useability testing to come up with a user-centred design by iteratively improving my design through feedbacks from the users. By conducting this testing, we have collected valuable user data which can be always used to track the improvement of the prototype. By the end of this design project, we ended up with a failure-resistant, consistent interface design and good visibility in the interface features to a greater degree than before.

6.References

1) Sachin Rekhi (2017). Don Norman's Principles of Interaction Design. [online] Medium. Available at: https://medium.com/@sachinrekhi/don-normans-principles-of-interaction-design-51025a2c0f33

2)blog.unguess.io. (n.d*). Thinking aloud: what is it and for which digital product is it worthwhile?* [online] Available at: https://blog.unguess.io/en/thinking-aloud-what-is-it-and-for-which-digital-product-is-it-worthwhile#:~:text=Thinking%20aloud%20is%20a%20typical [Accessed 21 Mar. 2022].

7.Appendices

Tables for Tasks matrix and time taken for task completion is presented below from the data recorded from the users.

Tasks Matrix					
Requirements					
Tasks		Requirements 1	Requirements 2	Requirements 3	Requirements 4
	Task 1	*		*	
	Task 2		*		
	Task3	*		*	
	Task 4				*

Table 1: Tasks Matrix

Time taken for tasks completion (in seconds)					
User		Task 1	Task 2	Task 3	Task 4
	No. 1	35	34	16	22
	No. 2	22	30	12	20
	No.3	20	25	11	23
	No. 4	17	24	10	26
	No.5	15	22	14	15

Table 2: Task completion time