

**Employing graphic designs to promote healthcare for the deaf and  
dumb using mobile applications**

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**Abstract:**

Nowadays, the deaf and dumb category represents many people in our society. Sign language is the main way to communicate with the deaf and dumb, but most of the normal people have no ideas about this language. For this reason, there is an increasing need to find alternative solutions to communicate with them. We can suggest three different ways to help the deaf and mute to enjoy a better and easier life.

First, LIFE BEATS helps deaf and mute people use the app during health emergencies and accidents. Secondly, the "Keyboard for Deaf" feature supports design language images and symbols in the keyboard as a different feature for graphics and graphic designs. Finally, helping the doctor and health units to understand the patient and the injured easily that can help the deaf to understand all the information explain the location of the pain.

Deaf and mute people mainly rely on sign language to send or receive information from or to others around them. As is known, sign language uses hand gestures, facial expressions, and hand movements to communicate with others. It was difficult to know these expressions to the audience which caused a great problem for the deaf and dumb to convey their thoughts or thoughts to others.

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Nowadays, there are alternative solutions that can help these important groups of people to give them more confidence when communicating with others. The main objective of this work is to propose new ideas or techniques that use modern technologies in various fields to support the deaf and dumb.

**LIFE BEATS:** Suggested Service: The main idea is to integrate or add a new feature to the App's website about protection and health awareness. All menus, information, inquiries and menus are written in either English or Arabic. For this reason, a person who is deaf or mute cannot do anything about himself or initiate any transaction or request any service by himself, always needing help from others to perform such services. Because there is a large group of deaf, dumb, or hard of hearing people who lack understanding of complete Arabic sentences and the way sentences are formed, so we made sure to make the LIFE BEATS application and its importance to help them report any accident by adding a symbol next to each field by clicking on it, a drawing appears that translates each field into sign language.

**Research problem: Enables the basic problem to search in:**

Does graphic design have a role in helping people with special needs during health emergencies?

Does graphic design have a role in helping people with special needs to better communicate with society?

- What areas of design are used to communicate with the deaf-mute?

**research importance:**

This field has become important in light of the changes in technology and the spread of new viruses in the current world. Technology has also imposed the need to deal with it to help the development of remote communication, especially since the deaf and dumb cannot communicate with voice.

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**research aims:**

**The research aims to:**

- Shedding light on caring for health emergencies and how to deal with deaf and mute people.
- Clarification of the development of e-learning and social networking sites for the deaf and dumb.

The research also deals with the design of a special mobile application that helps the deaf and dumb in health emergencies.

**Research Methodology:**

The research follows the analytical approach.

**Research limits:**

Temporal limits: 2000-2021

**Spatial limits:**

available from the countries of the world

**LIFE BEATS:** Suggested Service: The main idea is to integrate or add a new feature to the App's website about protection and health awareness. All menus, information, inquiries and menus are written in either English or Arabic. For this reason, a person who is deaf or mute cannot do anything about himself or initiate any transaction or request any service by himself, always needing help from others to perform such services. Because there is a large group of deaf, dumb, or hard of hearing people who lack understanding of complete Arabic sentences and the way sentences are formed, so we made sure to make the LIFE BEATS application and its importance to help them report any accident by adding a symbol next to each field by clicking on it, a drawing appears that translates each field into sign language.



color code: 029fe2

#### **Logo color selection:**

The meaning of the blue color The blue color refers to many different meanings, connotations, and symbols, the most prominent of which are the following: energy and excitement When the blue color is linked to vitality and activity, it represents an enthusiastic color that spreads excitement and activity in one, but on the other hand, we do not forget that individual experiences on people affect their condition Moods differ, and therefore these meanings cannot be generalized and considered universal, just as cultural differences play a major role in people's perception of colors and the way they are affected by them differently, including blue.

Calmness and tranquility The blue color is closely related to the clear sky and calm waters, which makes many people attracted to it and see it as very calm and emotional, and it may make them feel comfortable and still and reduce their sense of tension and anxiety, and on the other hand, the stormy sky and moving water may change one's view of blue and make it excite feelings of energy And the power he has, which explains the change of point of view and the significance of color depending on the situation or design, or the image in which one sees it.

Trust, loyalty, and strength Many people may prefer the blue color and find it distinctive and attractive in their own way, which makes it one of the most popular

colors in the world, and creates for it a set of complex and contradictory meanings that differ from other colors, as it differs from one person to another, and even its same degrees may carry Many distinct meanings, including the following:

Blue represents intelligence, power, confidence, and dignity. Bright blue indicates cleanliness, strength, dependability, and coolness. Light blue symbolizes peace, calm, spirituality, and may refer to infinity. Broad imagination and inspiration The blue color may sometimes be associated with wide open spaces, which in turn enhances the sense of freedom, arouses intuition, wide imagination, inspiration and sensitivity in the viewer. Deep and influential meanings, including: wisdom, stability, intelligence, faith, and others.

**The three most important challenges or risks, and what is the proposed plan to overcome them?**

- It is difficult to find a translator for it, and few translation applications allow it.

The proposed plan to overcome it: Provide language translation in the most important applications used.

Transfer the translation to them correctly. The proposed plan to overcome it is to take care of the emergency and health units for the deaf and dumb.

- Basic references for animation design are difficult to find, or references are limited. The proposed plan to overcome it: to prepare a database that contains the largest possible number of words used in sign language and its movements and to make it open source for its benefit to patients and those affected by the drawings of pain and the cause of the accident.

.(2018 ‘Kartikasari و Hartanto ؛ 2018 ‘Alzohairi et al. ؛ 2011 ‘Barczak et al. )

The main idea is to create graphic representations of the location of the pain and the accident.

Deaf Keyboard: Feature Suggested This second method has not existed for some time. All current keyboards can support different languages like: English, French,

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Arabic, etc. As in technology-based services for the deaf and dumb in addition to languages, keyboards can support emojis, shapes, and emoticons.

**Sign language** is the main language used by the deaf and mute to communicate what they want to others, and learning these languages is important for communication with this class. In addition, it is useful for the average user to understand the meanings of these signals, either to help them or to talk to them and have a useful dialogue

The idea of the application is a keyboard that enables the use of symbols over the phone, as the keyboard is switched to this panel that contains symbols, each symbol of which corresponds to a concept or purpose within the application, which leads to the installation of a simple and understandable phrase for both parties. We also seek to add references to the most common vocabulary of verbs and nouns where each symbol means a specific word or phrase, and overlapping with each other completes a simple conversation with others

(Simple conversion, <https://www.youtube.com/watch?v=f0Z2BhQEqOs>).

The goal is to enable this group to create effective communication through social media, and the application helps to learn a language for beginners who do not know how to write, and the user can develop his skills in understanding the language and having conversations.

And the settings for adding the language can be easily adjusted through the application, and the language will be written next to the symbols.

The three most important challenges or risks that your technical solution may face, and what is the proposed plan to overcome them?

- Unavailability of multiple electronic resources in a language understood by the deaf and dumb.
- Lack of knowledge of the signs assigned to each word, as some words are similar.

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- Lack of awareness of the need to know the basics of sign language and the need to communicate in this language.

Word signs were used in the language of symbols

The proposed idea is to support a new feature of the keyboard that puts new keys containing sign symbols as is where it acts as a switch between any language and sign symbols.

The goals of all members of society, not just the deaf and dumb, the solution is to raise awareness of the importance of writing. Reverse transaction is also supported; If an ordinary person starts communicating in their native language, be it English, Arabic or any other language, that message will be converted into a sign language that is understood by the deaf and all.

**"HEALTHCARE"** means health care, and the name of this method means that the deaf person should be aware of the medicine that he took. The traditional way for any patient to find out any information about a medication is to read the instructions from the sheet. In addition, all instructions given to the patient are also written in the box. Deaf people have a very difficult problem understanding or identifying medication instructions. The main goal is for the patient to be able to read a prescription in sign language, so they are confident and satisfied. The idea is that each medicine box contains a barcode that the pharmacist adds when dispensing the medicine to the patient, and when the patient scans the barcode through the camera of his smartphone, a page opens to which the sentences are translated. And a simulation in symbol language without a 3D character at the same moment that shows the duration and the permissible amount of treatment. The patient can also read the drug leaflet represented in the language of symbols, which allows the patient to fully and correctly understand the method of using the drug.

What are the most important challenges or risks that your technical solution may face, and what is the proposed plan to overcome them?

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- The patient's inability to connect to the Internet, and the solution is to provide bar code scanners in pharmacies or hospitals.
- The difference in the work of the users of this technology and the solution is the design of the site or its interface in a smooth and clear manner that allows patients of all ages to deal with and understand it with ease and comfort.

These are different ways that can help maintain a better and easier life.

Firstly, the “LIFE BEATS” service that can help deaf people use the app for accidents or health care.

Secondly, the technology-based "Keyboard for Deaf" feature for the deaf and dumb that can support pictures and symbols in different keyboard feature to switch between the language of the normal person and the language of the deaf.

Third, a set of graphic images and symbols for a large group of words to teach writing in Arabic and English

Finally, “HEALTHCARE” that can help deaf people understand all the information about the medicine given to them.

**The app is for deaf and dumb emergency based on the principles of human interaction and mobile applications.**

**methodology:**

We propose this system that aims to serve people with special needs and those who have difficulties in speaking or listening, through emergency communication

Technology will be used, communication and emergency powers are made through the application that makes deaf and dumb people talk over the phone via keyboard or device.

A good intelligent interactive product, human focus and decision thinking when they interact with something The main idea is that devices, objects, computers and interfaces should be functional, easy to use and intuitive.

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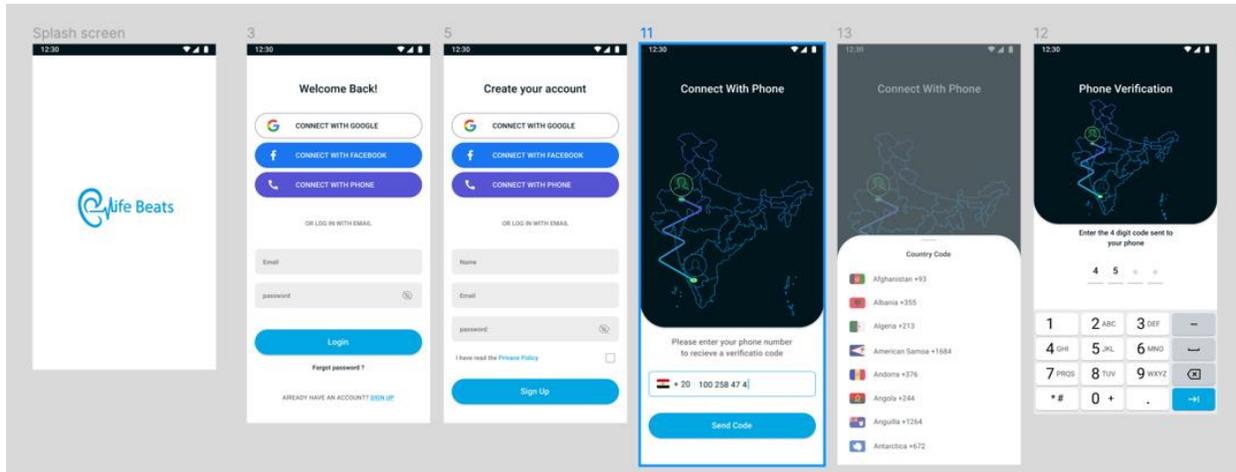


Figure No. (1) Login to the application can be by e-mail or by mobile phone.

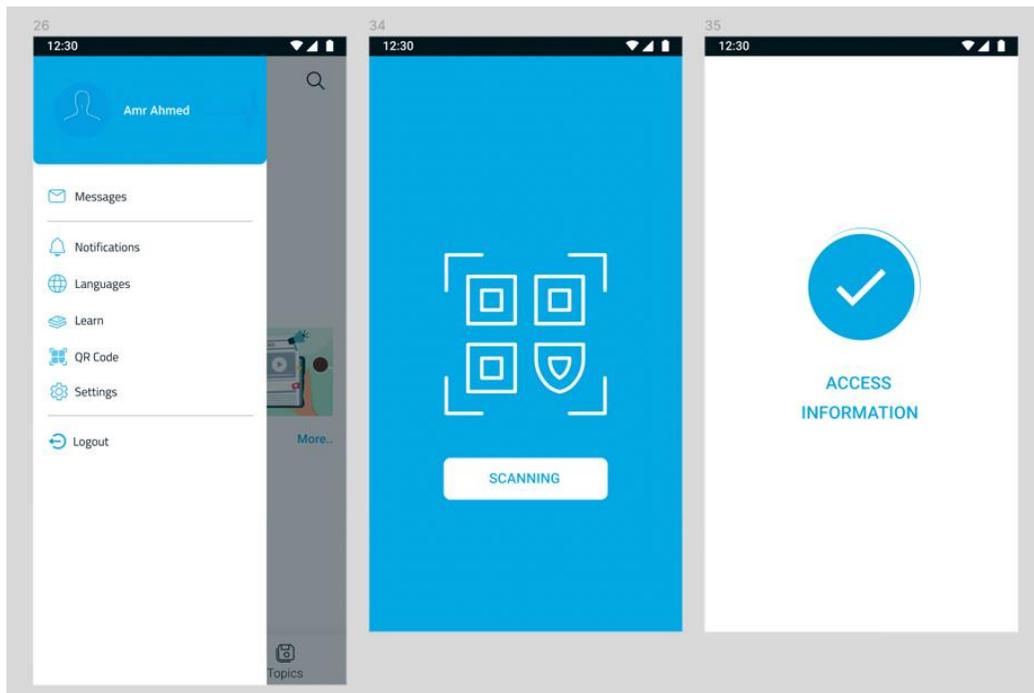


Figure No. (2) The login has been completed successfully in the application.

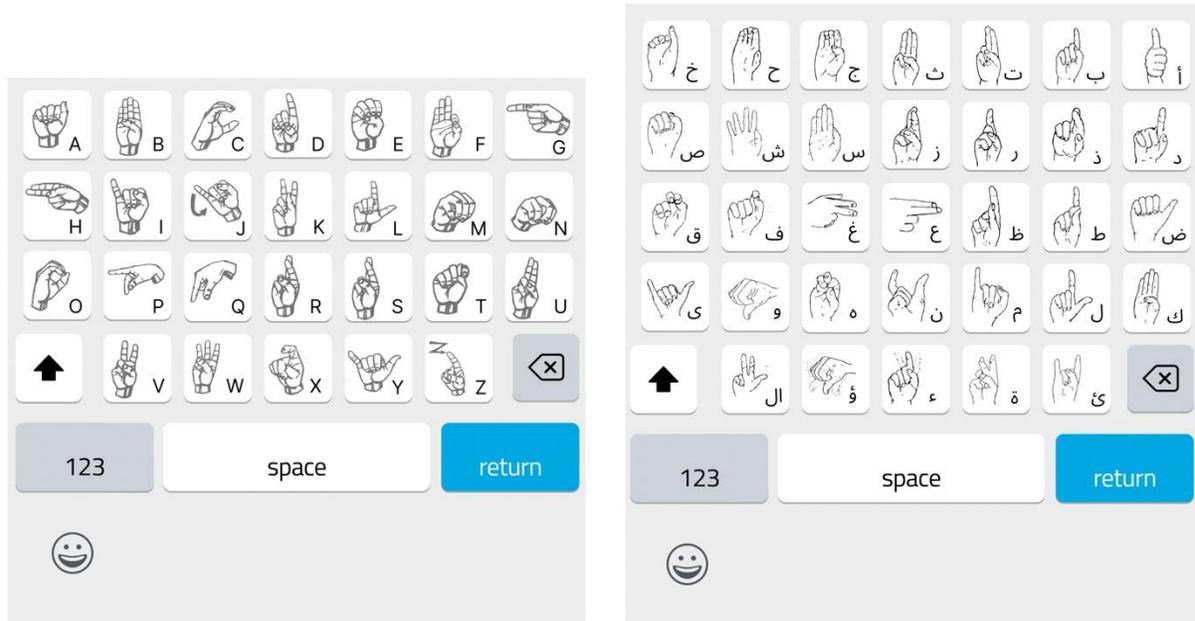


Figure No. (3) The sign language keyboard.

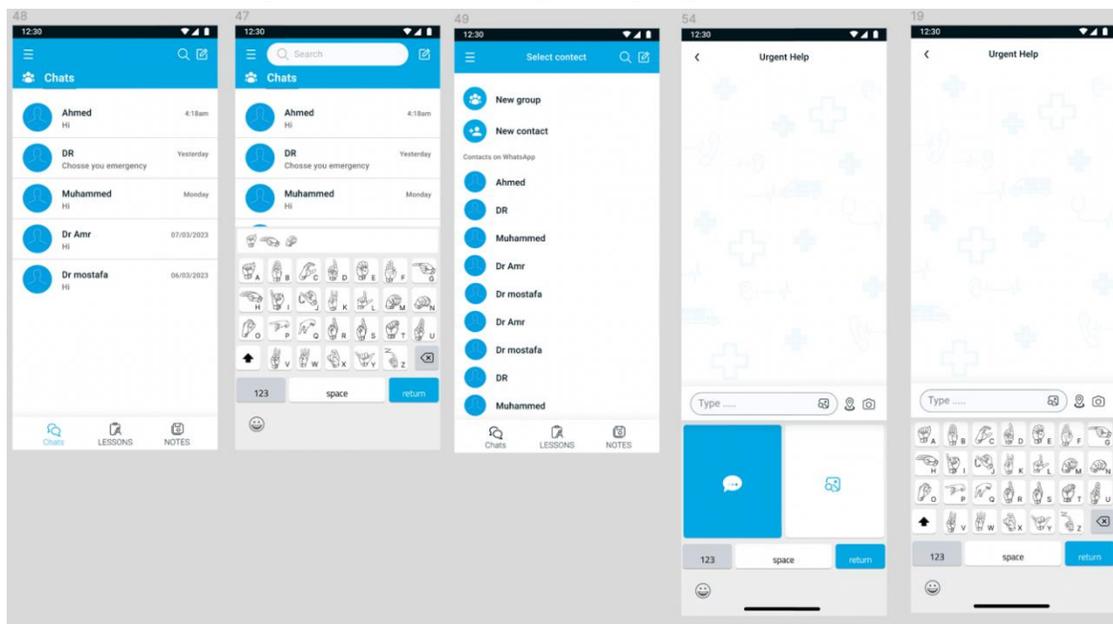


Figure No. (4) The form of chatting in case of emergency, and he can choose between sign language or pictures and graphics.

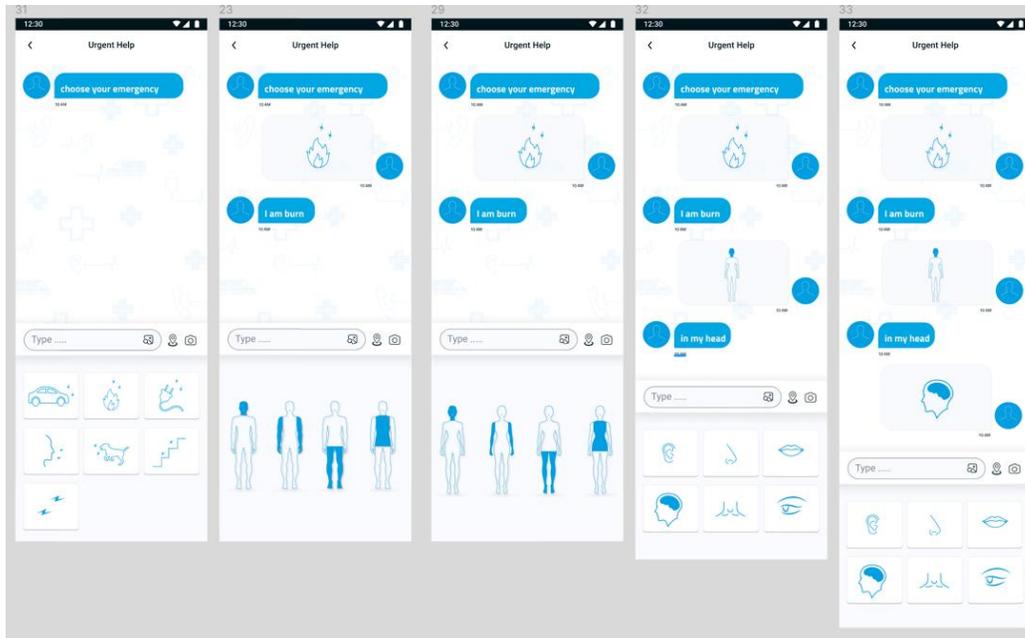


Figure No. (5) The form of emergency chat with pictures and graphics.

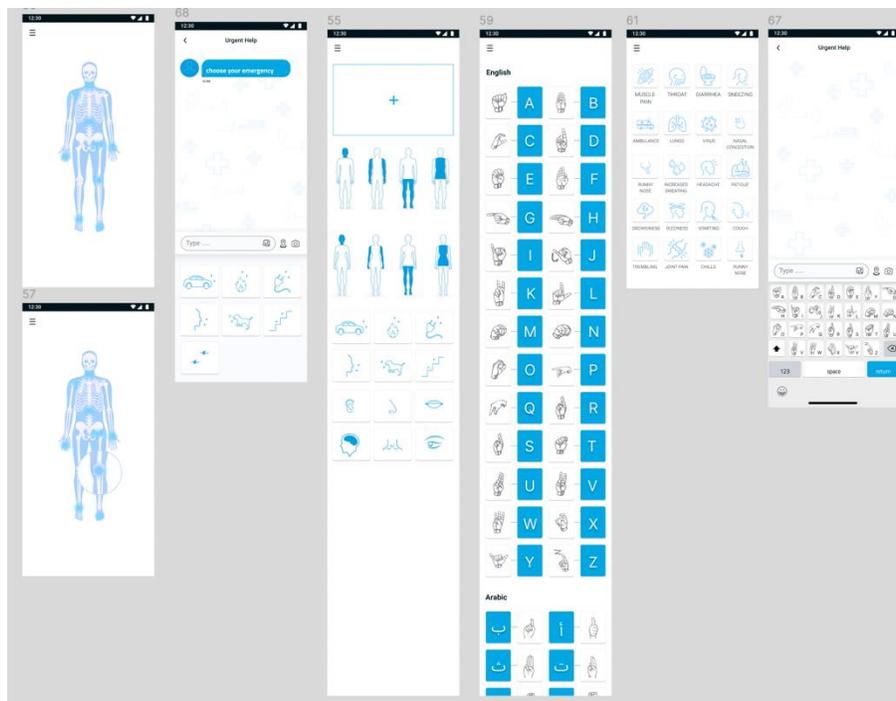


Figure No. (6) Some aids in the application to learn the language and after the words to communicate during health emergencies.

1. Make the user sign up before they use the app
2. Save the user information.
3. Check emergency laws.
4. Give the user a review about the emergency agency they requested.
5. Notifying the user of the expected arrival time.

**Interaction model for each objective:**

**the first goal:**

1. Make the user register before they use the app.
2. Log in to the program.
3. First when entering the application, the first interface appears, and to register, the user must fill in the following data: Full name
4. Clicking the Record button.
5. Send system verification messages to the user.
6. The user is registered in the system.
7. The user is now part of the system.

**The second goal:**

1. Save user information.
2. User information has been saved in the database.
3. The information must first be entered by the user in the registration interface, and then he will check the check box to ask if the user wants to save his registration information (remember me).
4. Clicking the Remember Me check box.
5. The Remember me check box will be selected as long as the user wants to save their information in the system.

6. User information is saved in the database.
7. The user can enter the program next time without filling in the login information.

**The third goal:**

1. Emergency Check.
2. The user selects the emergency service.
3. The user must check which emergency service he needs.
4. Confirm the emergency service selections.
5. The current state of the system is that it provides the emergency service that the user needs.
6. Send the case to the emergency service.
7. Confirmation of sending the service.

**Fourth goal:**

1. Give the user a review about the emergency agency they requested.
2. Confirm the user's request.
3. The user can modify the emergency service by clicking on the edit button, then return to the emergency interface.
4. Click on the Confirm button.
5. The system will display a message to the user stating that the request has reached the required emergency service.
6. The emergency has been reached to the desired destination.
7. Emergency team move.

**Fifth goal:**

1. Notifying the user of the expected arrival time.
2. The user knows the expected time of arrival of the emergency team.
3. The interface contains the expected time and a map where the user can track the emergency team.
4. Click on the map to track the emergency team.

5. View the map and see the remaining minutes.
6. Track the location of the emergency agency through the map.
7. Follow up the emergency team and know the expected time for the team's arrival.

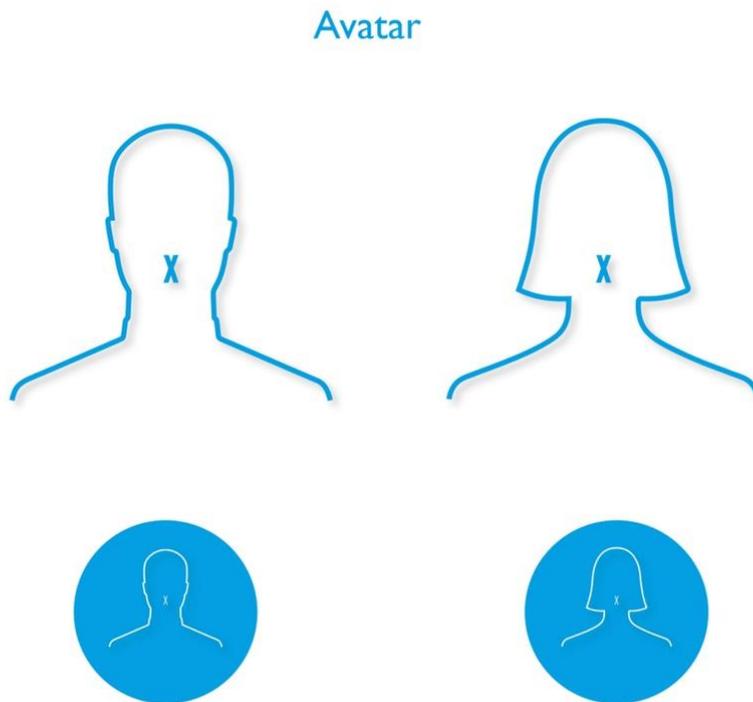


Figure No. (7) the shape of the avatar, showing that he is deaf and dumb because there is an X at the mouth.

1st intro motion when pressing quick urgent help.

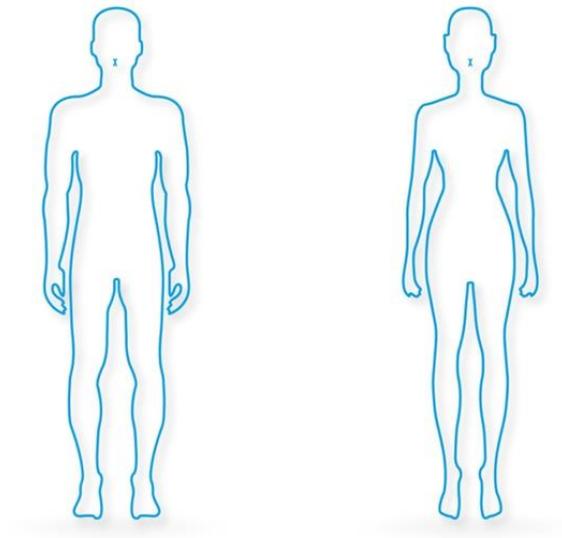


Figure No. (8) A figure showing the type of user.

key board first page.

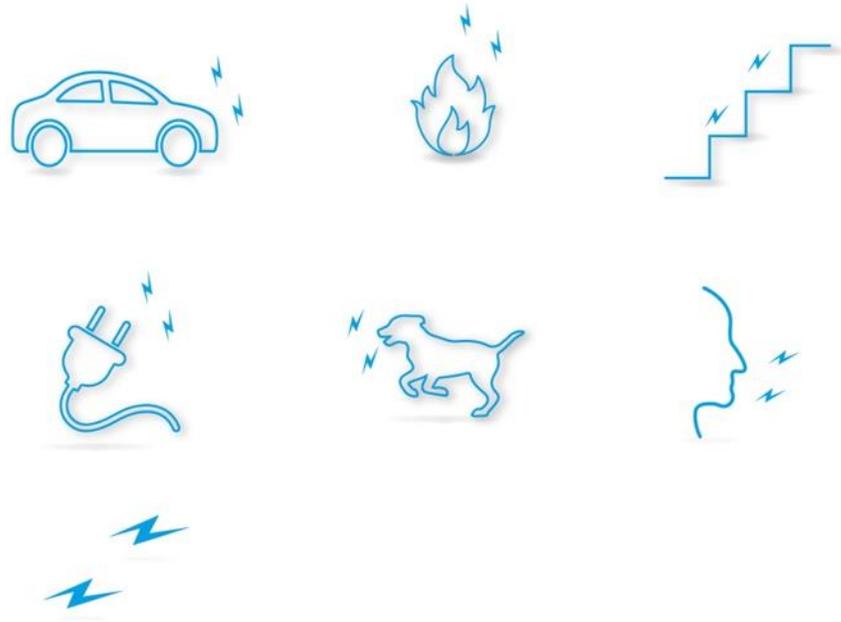


Figure No. (9) explains the cause of the accident.

second key board page for men

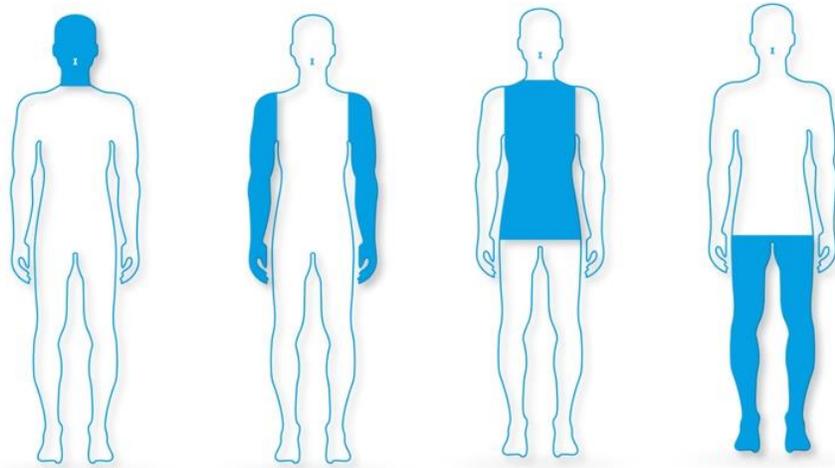


Figure No. (11) shows the identification of the area that the injured person wishes to talk about.

second key board page for women

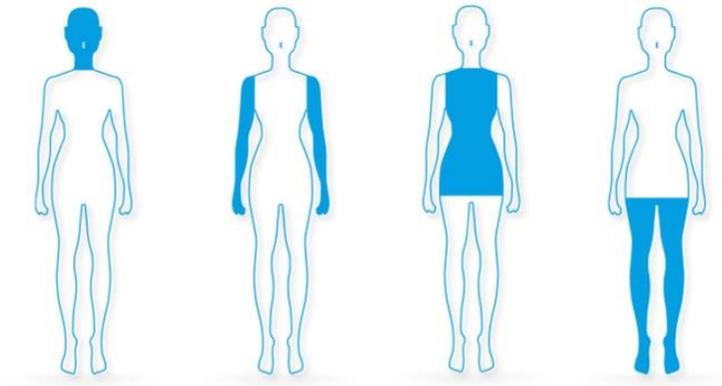


Figure No. (12) shows the identification of the area that the injured person wishes to talk about.

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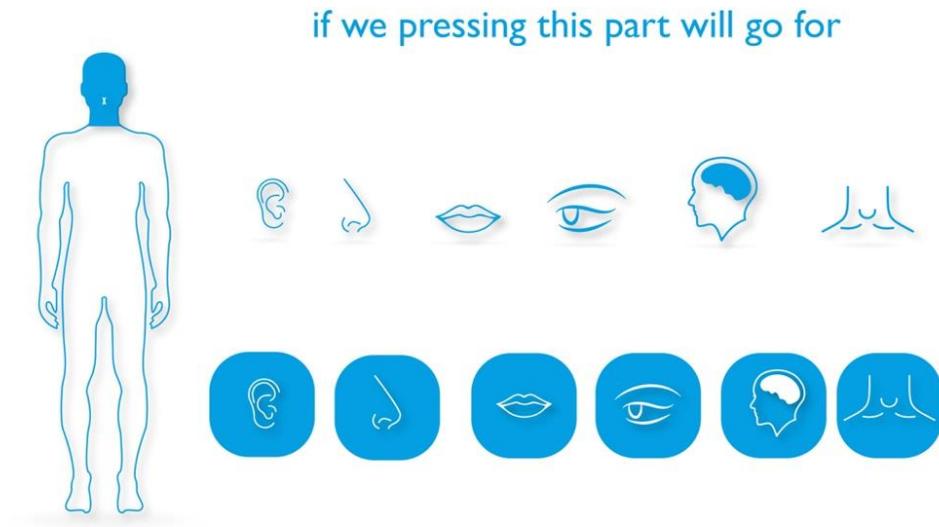


Figure No. (13) shows the determination of the head region.

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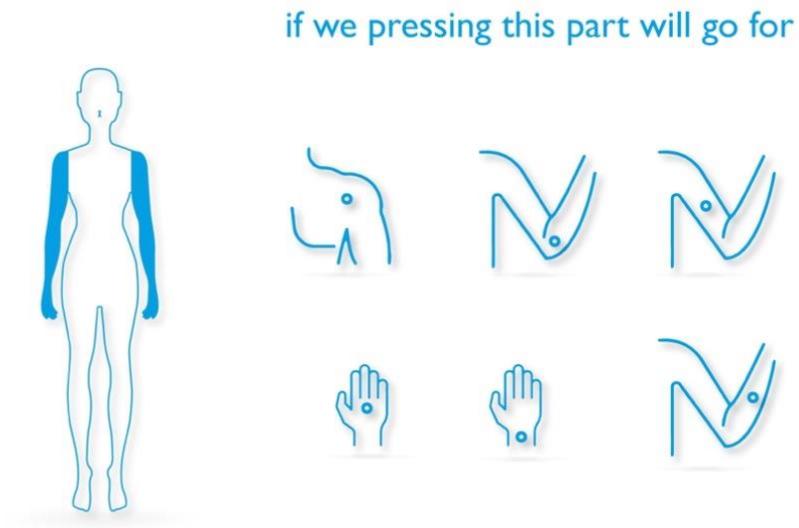


Figure No. (14) shows determining the arm area.

if we pressing this part will go for

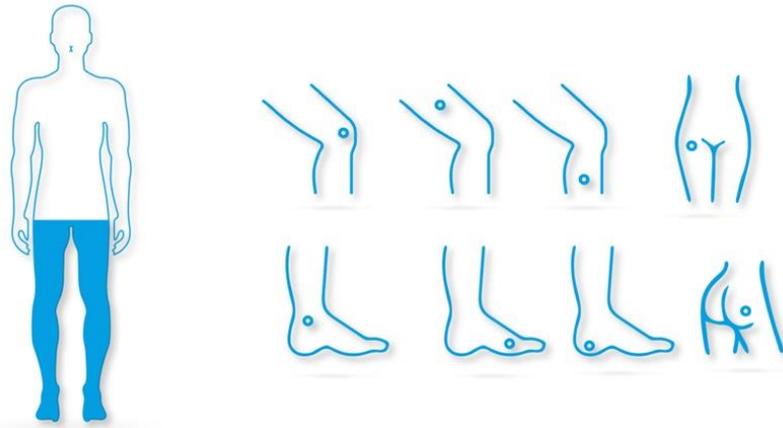


Figure No. (15) shows the determination of the lower region.

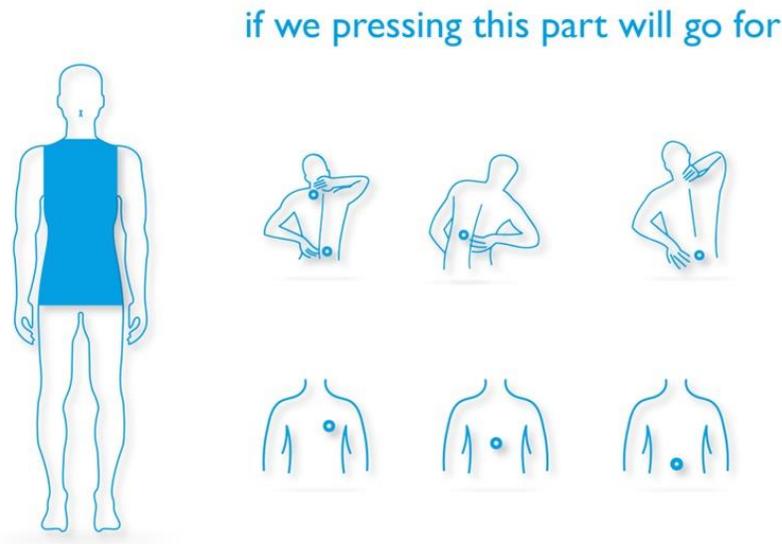


Figure No. (16) shows the determination of the lower region.

**Evaluation process:**

The team of evaluators evaluates the usability of designed interfaces through the method of expert analysis, and they choose the heuristic evaluation approach because it is relatively flexible and inexpensive. The raters also rate the severity of each usability issue,

Based on four factors:

How common is the problem, how easy it is to overcome, is it going to be a one-time problem or an ongoing problem, and how serious the problem is. The problem is realized.

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