

# Proposal of a Counseling Application on Patient Care with Non-Communicable Diseases

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**Abstract** - Currently, the treatment of chronic non-communicable diseases is currently one of the greatest challenges facing health systems worldwide. This is because these diseases affect all age groups and all regions and countries, regardless of their stage of development. However, the World Health Organization points out that inadequate management of these conditions is carried out, for different reasons, in most health systems. The objective of this article is to achieve a proposal for a mobile application of advice on the current and future problems of non-communicable diseases for people, where prevention and health promotion continue to be the fundamental weapon to combat said challenge, in addition to performed with the Scrum methodology. The importance of this knowledge for professional staff in training, the need to establish present and future strategies to guarantee the health of our population, fundamentally from primary care and the organizations linked to them, must be considered. The population, which is the most affected, must become more aware of what it means, in general, to suffer from a chronic disease and even more so by having a cell phone that is available to everyone.

**Keywords** - Non-communicable diseases, mobile application, health, Scrum Methodology.

## INTRODUCTION

The leading causes of death and disability in the world today. The term, non-communicable diseases refer to a group of diseases that are not primarily caused by acute infection, but instead result in long-term health consequences and often create a need for treatment and care at a distant time. Non-communicable diseases (NCDs) kill 41 million people each year, which is equivalent to 71% of deaths in the world. In the Region of the Americas, there are 5.5 million deaths from non communicable diseases each year.

Worldwide, 15 million people between the ages of 30 and 69 die from NCDs each year; over 85% of these "premature" deaths occur in low- and middle-income countries. In the Region of the Americas, 2.2 million people die from NCDs before their 70th birthday [1].

These diseases are favored by factors such as rapid and unplanned urbanization, the globalization of unhealthy lifestyles or the aging of the population. Unhealthy diets and physical inactivity can manifest as high blood pressure, increased blood glucose and lipids, and obesity. They are the so-called "metabolic risk factors", which can lead to cardiovascular diseases, the main NCD in terms of premature deaths. Non-communicable disease affects all age groups and all regions and countries. children, adults, and the elderly are all vulnerable to risk factors that favor NCDs [2]

These conditions include cancers, cardiovascular diseases, diabetes, and chronic lung diseases. Many other important conditions are also considered NCDs, including cell injuries and mental health disorders. Cardiovascular diseases make up the majority of NCD deaths (17.9 million each year), followed by cancer (9.0 million), respiratory diseases (3.9 million), and diabetes (1.6 million). world level. These four groups of diseases are responsible for more than 80% of all premature deaths from NCDs [1].

The data for Peru show a considerable prevalence of chronic diseases, especially for indicators of obesity. The emergence of chronic non-communicable diseases is multifactorial, and the impact is much more since it affects different spheres beyond public health. That is why the necessary solutions require the coordinated action of many sectors. Above all, dealing with these diseases does not only imply treating adults with disease but, on the contrary, involves the entire spectrum of life where prevention must begin early, from pregnancy and childhood. Understanding how these factors interact in our contexts will provide new tools to tackle this problem [3].

In order to solve the problem and have a better follow-up of people who are suffering from diabetes, a good way is to use technology, according to the times we live in, which would be Smartphones at the moment, since now everyone counts with a mobile device.

For this reason, the application will have the following characteristics that can help those responsible to have a better follow-up, because it will allow them to have monitoring that makes it easier for the user to have control of the disease, the registration of determinants such as sedentary behavior, food - diet and management of medication doses, also the history of use of the application provides valuable information to the patient – doctor – physical educator

The objective of the article will be to develop a counseling application on care in patients with non-communicable diseases.

The rest of the document was organized in the following ways, section II will define the methodology, tools to be used, section III will show the case study, section IV will show the discussions, V will show the results and finally section VI will show the conclusion.

**METHODOLOGY**

In this section we will specify the steps that will be followed for the development of the mobile application, for which we will use the agile Scrum methodology since its working method, and continuous reviews will help us to have a higher quality mobile application (software). It will also be detailed about the tools that are more adaptable for the development of the mobile application.

*a) Methodology Scrum:*

The Scrum methodology is a process to carry out a set of tasks on a regular basis with the main objective of working collaboratively, that is, to encourage teamwork. With this working method, what is intended is to achieve the best result of a given project. The practices that are applied with the Scrum methodology feed off each other and the integration of these has its origin in a study of how teams must be coordinated to be potentially competitive [4].

*It has 5 phases: First Start Phase:* In this stage, those involved meet to plan the sprint and designate the tasks that each person on the team will develop and each of them must assign a time to carry out the task [5].

Next, Table I will show the user requirements to be able to handle the application.

For the development of the Sprint, a planning was carried out as shown in table II, a duration of two to four weeks is estimated. The objective of each Sprint is to achieve a value delivery of the product. Likewise, in the first Sprint it will contain the minimum viable version of the product as basic functionalities, also considering the prioritization of the client.

**Table 1.**  
**Comparison Methodologies**

| No. | Description  |
|-----|--|
| 1   | As a user I want to enter the application through a login  |
| 2   | As a user I want to register to the application by mail  |
| 3   | as a user I want to have information about non-communicable disease  |
| 4   | As a user I want to have a balanced diet according to the disease I have   |
| 5   | As a user I want to have an exercise guide according to the disease I have   |
| 6   | As a user I want to have a conversation with the doctor according to the non-communicable disease I have so that he can follow up on the disease |
| 7   | as a user I want to receive notifications to take pills or remind me to do exercises   |
| 8   | As a user I want to know which doctor treats me and have his information   |

**Table 2.**  
**Sprint Development**

| No.      | Description  |
|----------|--|
| SPRINT 1 | R1. Enter the application by a login                       |
|          | R2. Module to register                                     |
|          | R3 Module to have information on non-communicable diseases |
| SPRINT 2 | R4. Module to have an exercise routine                     |
|          | R5 Module to have a food plan                              |
| SPRINT 2 | R6. Module to talk with a specialized doctor               |
|          | R7. Module to receive notifications                        |

*Second Phase* Scrum Team meeting and development of the Sprint; These are meetings that last 15 minutes a day and serve to provide mutual support in case they encounter problems in the development of any activity [5].

*Third Phase* Backlog Refinement: Used for a review by the Product Owner of the requirements to clarify any doubts that the team may have [5].

*Fourth Phase* Sprint Review: It is a review of what has been done within the sprint and the finished work is shown, this oversees the scrum master and the product owner [5].

*Fifth Retrospective Phase:* It is the point of the product owner who meets with his team to be able to talk about what happened during the sprint [5].



Fig. 1 Scrum Process[6]

b) Development Tools:

Figma is one of the web prototyping tool and vector graphics editor, which unlike the other tools, it is hosted on the web. Also, one of the features of Figma is that it was browser based and you can share project with your team [7].

*Android Studio:* Android Studio is the official integrated development environment (IDE) for Android app development and is based on IntelliJ IDEA. In addition to IntelliJ's powerful code editor and developer tools, Android Studio offers even more features that increase your productivity when developing apps for Android [8].

*Firebase:* Basically, it is a mobile platform designed and created by Google, whose main function is to develop and facilitate the creation of applications for mobile devices that have high quality despite their rapid development; this to increase the user database [9].

RESULTS

The development of prototypes is based on the identification of the business needs of the end user, the development of a mobile application is carried out through a system design with the objective that the application meets the functional engineering specifications in the form of Project. structure according to the needs of the project. The prototype has been modeled and tested, through analysis of system requirements to identify business needs, it is a good reference for users about the products offered for each sprint. Prototypes were used to get a clear idea of what the final product would look like considering the design requirements set by the OP. Similarly, stakeholders can clarify their expectations of the final product, it is important for the developer to have an overview of what the final structure of the application will look like, considering how each request is structured. The prototype will be developed in Figma and will contain a visual sample of the application structure. During the development of the application prototypes, based on prioritizing the requirements and basic functions for the operation of the application to increase the value of the business, based on the above, this project is divided into 3 sprint steps.

*Sprint 1:* 3 requirements were made. In Requirement 1, Fig. 2 shows how the user can enter the application and be able to interact with the application. In requirement 2, as shown in Fig. 3, the user will be able to register for the application by entering their data or they can connect through their other Google accounts and to complete requirement 3, the user will be able to choose from a list where all the non-communicable diseases the information of each one of them, detailing how dangerous it is and there will be a recommendation that you can make if you have one of them as shown in Fig. 4.

In addition, the user when registering will be able to put their information and the problem they present so that they can receive advice according to the disease they present, as shown in Fig. 5.



Fig. 2 Login

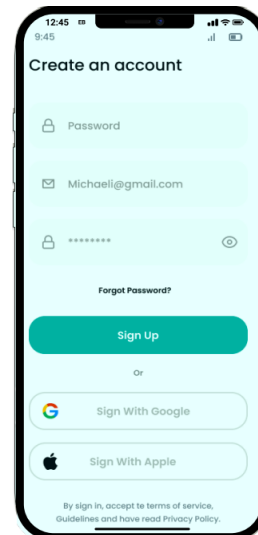


Fig. 3 User register



Fig. 4 information on noncommunicable diseases

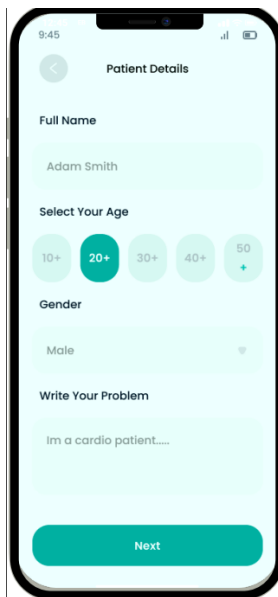


Fig. 5 Information of the Patient

*Sprint 2:* 2 requirements were made, in requirement 4 it can be seen that the user will be able to have a balanced diet depending on the non-communicable disease they have and they will also be able to have the detailed recipe of each one of them, as we know the diet is one of the fundamental problems of why they happen and the users will be able to observe it, as shown in Fig. 6 and Requirement 5 will show how the users will be able to choose the exercise routine depending on the level they choose and the amount of time they spend. they want to have in their free time, they will have several routines according to the list of diseases that will be presented as shown in Fig. 7.

*Sprint 3.* In requirement 6 the user will have the option to have a conversation with the doctor who is specialized in the treatment of non-communicable diseases through a chatbot as shown in Fig. 8 and, in addition, they will be able to see the information in detail of all the doctors who are registered as shown in Fig. 9

In Requirement 7 you can have a notification module to be able to remember some pills that you must take or what exercises you must do and in addition to reminding you that you need to continue with the plan to be able to control the disease that has been previously selected, as well as shown in Fig. 10.

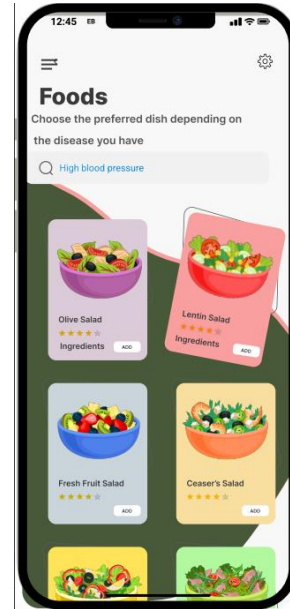


Fig. 6 Balanced diet



Fig. 7 Exercise routine



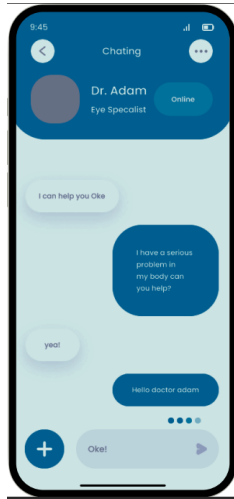


Fig. 8 Conversation with the doctor

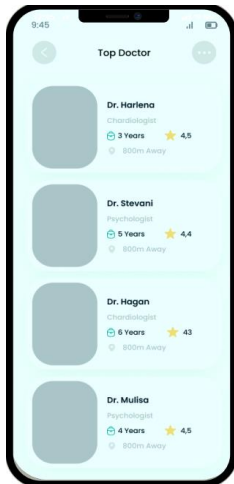


Fig. 9 List of doctors

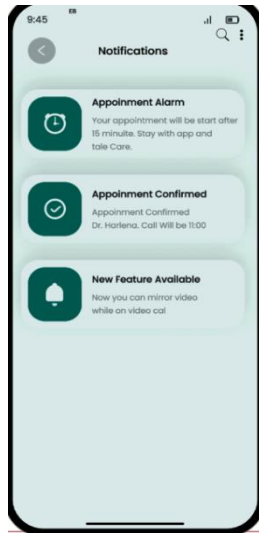


Fig. 10 Notifications

## DISCUSSION

Scrum focuses more on making short-term deliverables giving continuous improvements to the client, thus also giving a retrospective if it was what the client needed or what can be improved for the next deliverable, it is also in accordance with the needs and can also be changed Over time, compared to the traditional methodology, the entire project is delivered at the end, when everything is already built, so the methodology is willing to change compared to the traditional methodology, which is a bit more complicated.

Compared to other applications and research, the project helps all non-communicable diseases, because a very strict study was made of each of them in order to provide the best advice according to each person and each level that is found to have a very good improvement.

## CONCLUSIONS

The prototype of this application was developed, to have a better monitoring and control of all non-communicable diseases and the users want to apply them in their routine life. Thus, improve their condition and that they can have a specialist so that they can be of support in the treatment that they have. The problem that Non-Communicable Diseases currently represent and the challenge that their treatment implies for the coming years, make it necessary to draw up specific strategies in our sector. Continuing education regarding these diseases is necessary, especially in PHC with a higher level of updating. A better preventive work is necessary and above all educational promotion in the population.

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