

¹Lida Violeta Asencios-Trujillo

²Lucia Asencios-Trujillo

³Carlos Jacinto La-Rosa-Longobardi

⁴Djamila Gallegos-Espinoza

⁵Cristina Piñas-Livia

⁶Hernan Matta-Solis

⁷Rosa Perez-Siguas

⁸Eva Ventura-Hernandez

Design of a Mobile Application for Geolocation and Medical Information for University Students in Emergency Situations



Abstract: - The present research work focuses on the design of a mobile application to geolocate and provide medical information to university students in emergency situations. The growing interest in the use of mobile technologies is recognized, highlighting the need for innovative solutions to improve the safety and well-being of students on campus. The methodology used was based on a literature review and analysis of previous studies that highlight the importance of technology in promoting the health and safety of university students. Research highlighting the use of mobile applications and information and communication technologies to address challenges related to health and physical activity among college students was discussed. In addition, the need to ensure the accuracy and reliability of the information provided through the mobile application was highlighted. The conclusion highlights the potential of the proposed application to improve the safety and health of college students while promoting a safer, more connected university environment. The importance of actively promoting the use of the app among the student community is emphasized and the need for collaboration between different actors to ensure the success of the project is underlined. In summary, this project has the potential to positively impact students' lives and contribute to the advancement of research in the field of digital health and campus safety.

Keywords: Mobile App, RUP Methodology, Health Promotion, College Students, and Improving Safety.

I. INTRODUCTION

Integrating technology to help college students geolocate nearby hospitals can take a variety of effective strategies. First, the development of specific applications that employ geolocation technology would allow users

¹*Corresponding author: Associate Professor, Escuela de posgrado, Universidad Nacional Enrique Guzmán Valle , Perú , Email Id: lasencios@une.edu.pe

² Associate Professor, Escuela de posgrado, Universidad Nacional Enrique Guzmán Valle , Lima-Perú , Email Id: lasencios@une.edu.pe

³ Associate Professor, Escuela de posgrado, Universidad Nacional Enrique Guzmán Valle , Lima-Perú , Email Id: clarosa@une.edu.pe

⁴ Associate Professor, Escuela de posgrado, Universidad Nacional Enrique Guzmán Valle , Lima-Perú , Email Id: dalia2635@hotmail.com

⁵ Associate Professor, Escuela de posgrado, Universidad Nacional Enrique Guzmán Valle , Lima-Perú , Email Id: dalia2635@hotmail.com

⁶ Teaching researcher, TIC Research Center: eHealth & eEducation, Instituto Peruano de Salud Familiar, Lima-Perú, Email Id: hernanmatta@gmail.com

⁷ Teaching researcher, TIC Research Center: eHealth & eEducation , Instituto Peruano de Salud Familiar, Lima-Perú , Email Id: rosaperezsiguas@gmail.com

⁸ Associate Professor, Escuela de Posgrado, Universidad Cesar Vallejo , Lima-Perú , Email Id: eventurah@gmail.com

to visualize hospitals near their location on an interactive map. In addition, implementing emergency alert systems in these apps could notify students of the location of the nearest hospitals in the event of a medical emergency [1].

Another strategy is to take advantage of the capabilities of mobile devices to access geolocation services and provide detailed information about nearby hospitals, including hours of operation, available services, and reviews from other users. Likewise, the use of augmented or virtual reality experiences could guide students to the nearest hospital, providing step-by-step instructions in real time [2].

Creating interactive web platforms represents another alternative, allowing students to enter their current location and receive instant information about nearby hospitals, along with relevant details. The addition of virtual assistants would also be beneficial, as they could answer specific questions about the location of hospitals and provide up-to-date information [3].

Additionally, facilitating the ability to share real-time experiences, such as feedback and ratings, through these platforms could help students make informed decisions about which hospital to visit. Finally, it is essential to ensure that information about the availability of medical services, hospital schedules, and locations is updated in real-time for accurate decision-making. Effective implementation of these strategies could significantly improve the ability of college students to quickly access medical services in emergency situations, providing them with timely and effective assistance [4].

The proposed application to geolocate nearby hospitals and offer medical information presents a number of notable benefits for university students. First, it allows for quick access to emergency medical services by providing the precise location of nearby hospitals, facilitating timely medical responses. In addition, the app optimizes time by providing real-time information on service availability and distance to hospitals, reducing waiting time in critical situations [5].

Efficient navigation capability is another key benefit, as the geolocation feature and map integration facilitates quick and accurate arrival at selected hospitals. The app also provides detailed information about hospitals, including hours of operation, available services, and reviews from other users, allowing students to make informed decisions about where to receive medical care [6].

The implementation of emergency alert systems is essential as it notifies users about the location of the nearest hospitals in real-time, improving awareness and responsiveness in critical cases. In addition, the app offers a personalized experience by allowing the personalization of information according to the specific medical needs of users [7].

Collaboration with virtual assistants is another advantage, as users can get quick and accurate answers to their questions about medical services, expanding the usefulness and effectiveness of the app. The inclusion of educational functions also contributes to the promotion of preventive health, offering information on regular check-ups, vaccinations and other aspects related to well-being [8].

The ability to share experiences in real-time through comments and ratings encourages feedback between users, improving the quality of the information provided and building trust in the application. Ultimately, the app provides convenience and peace of mind to students knowing they have easy and quick access to reliable medical information when they need it most [9].

The main objective of the research is to design a mobile application to geolocate and obtain medical information for university students in emergency situations.

The work is structured as follows in Chapter II Literature Review, III Methodology, IV Results, V Discussions and VI Conclusions.

II. LITERATURE REVIEW

The author [10], in his research entitled "University APP: An App for University Students" points out that the growing number of people using information and communication technologies (ICTs) to connect globally has generated a remarkable interest in smart devices, especially among users of mobile technologies such as smartphones and tablets. This interest is attributed to the constant availability of new devices that offer outstanding features, attractive costs, diverse sizes, and a variety of operating systems, all designed to meet the individual needs of users. In addition, these devices support a wide range of applications that go beyond standards, being simple, fast and secure, and used in various contexts such as social, industrial, economic and educational fields.

In this way, the author [11] points out that various health strategies have been proposed, such as the promotion of healthier lifestyles in primary care centers, in line with the objectives of the National Health Strategy (NHS). However, these strategies have failed to meet the purposes of the EENS due to the increase in chronic non-communicable diseases and the lack of regular physical activity, especially in the young population aged 18 to 25 years, where physical inactivity reaches 56.4%. Most interventions have focused on chronically ill populations, without considering the effect of health promotion on young people with no history of disease. Therefore, it is crucial to conduct interventions that assess the impact and scope of these applications on healthy groups of the population, especially those potentially prone to disease. This highlights the importance of kinesiology professionals in guiding and supervising physical therapy. In this context, the thesis project proposes to experimentally analyze the effects of a health promotion intervention using information and communication technologies, specifically WhatsApp, on the level of physical activity of students of the Catholic University of the Most Holy Conception.

Likewise, the author [12] in his research entitled "Internet as a means of consulting health problems in university students" focuses on the fact that, currently, many university students turn to the Internet as a primary source of information, whether to understand ailments, learn about diseases or explore aspects related to physical appearance. Despite the evolution of the Internet and mobile applications in all areas, there is concern about the reliability of the information that circulates online, especially in health matters, where the possibility of unreliable information or information that leads to errors and bad practices is significant. A study conducted in three higher education institutions in the city of Riobamba revealed that 85.3% of students own electronic devices connected to the Internet, while only 14.7% do not, although they use devices of friends or university students. In addition, it was found that 90% of students who access the Internet make their queries mainly on Google's website, which links or leads to blogs, health websites and scientific articles.

III. METHODOLOGY

A. BEGINNING

The objective of the project is to design and develop a mobile application for geolocation and medical information aimed at university students who are in emergency situations. This app will provide users with quick access to nearby medical resources, such as hospitals, emergency clinics, and pharmacies, based on their geographic location. In addition, the app will include functionalities to provide relevant information on first aid, emergency procedures and direct contact with help services.

- Implementation of geolocation functionalities to identify and display nearby medical resources.
- Development of an intuitive, easy-to-use user interface for quick accessibility during emergency situations.
- Integration of relevant medical information, such as contact details of local emergency services and first aid procedures.
- Customization of the app to suit the specific needs and requirements of college students.
- Guarantee the security and confidentiality of user data, complying with data protection and privacy standards.
- Extensive testing to ensure the functionality, reliability, and usability of the app before it is released.

These goals and scopes provide a clear direction for the development of the mobile app and ensure that it meets the needs and expectations of university users in emergency situation.

B. ELABORATION

In the project development phase using the RUP methodology, you will focus on transforming the requirements defined in the initiation phase into a detailed design and implementation plan.

Functional Requirements

- Precise geolocation to identify the user's location.
- Display nearby medical resources, such as hospitals, emergency clinics, and pharmacies, on an interactive map.
- Search functionality to find specific medical services based on the user's location.

- Detailed information about each medical resource, including address, phone number, and hours of operation.
- Integration with local emergency services for quick calls for help.
- Provision of relevant medical information, such as first aid procedures and safety tips in emergency situations.

Non-Functional Requirements

- Intuitive usability and easy navigation of the user interface, especially in stressful situations.
- Fast turnaround time for searching and viewing medical resources.
- Security of user data, guaranteeing the confidentiality and protection of personal information.
- Offline availability to ensure access to medical information even in areas with limited connectivity.
- Compatibility with different mobile devices and operating systems.
- Optimal application performance, minimizing device resource consumption and maximizing software efficiency.

C. CONSTRUCTION

Beginning

Figure 1 shows the prototype of what would be the main screen of the mobile application, which will have two buttons, the start and register.

Main Screen

Figure 2 shows the main screen of the application that will have 4 modules that will have different functions for better application performance.

Geolocation Module

- This module will use the mobile device's GPS to identify the user's location.
- It will display an interactive map with nearby medical resources, such as hospitals, emergency clinics, and pharmacies, marked on the map.

The result is shown in Figure 3.



Figure 1. Beginning



Figure 2: Main Screen



Figure 3: Geolocation Module

Medical Information Module

Figure 4 shows the medical information module which will provide detailed information on first aid procedures, emergency symptoms, and safety tips in emergency situations.

It could include how-to videos, infographics, or links to external resources for more information.

Notification Module

Figure 4 shows the medical information module which will provide detailed information on first aid procedures, emergency symptoms, and safety tips in emergency situations.

It could include how-to videos, infographics, or links to external resources for more information.

Doctors Module

Figure 6 shows the doctors module that will allow doctors to search for specific medical services, such as hospitals, pharmacies, particular doctors, based on their current location or a specified location. Users will also be able to filter the results by type of medical service or distance.

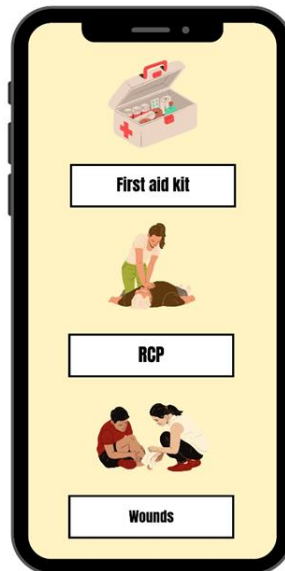


Figure 4: Medical Information Module

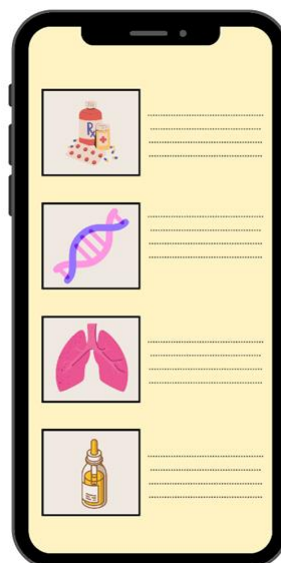


Figure 5: Notifications Module

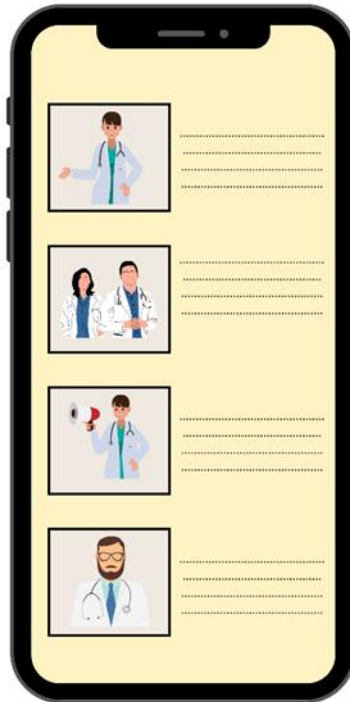


Figure 6: Doctors Module

D. TRANSITION

A survey was conducted among 20 university students about the benefits of using this application to find medical services from their current location.

1. Would you be using the mobile app to find medical services from your location?

The answer given by the university students was that if they would be willing to use a mobile app to find medical services, the results can be seen in Figure 7.

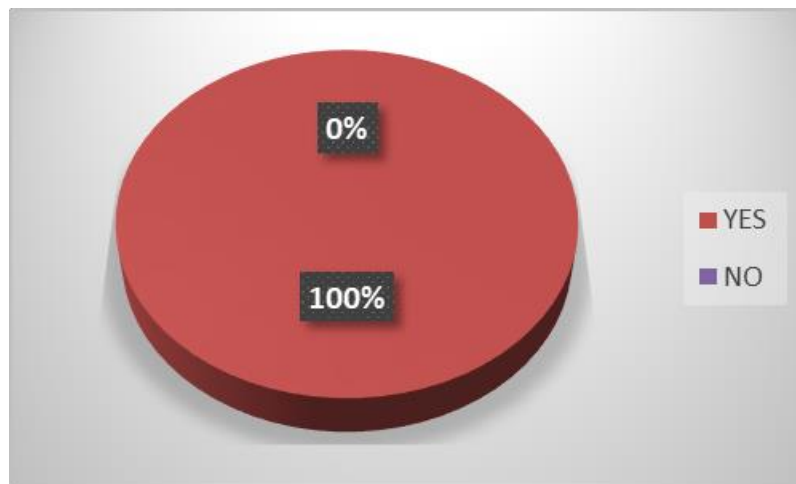


Figure 7: Using the mobile app

2. How often would you use the mobile app?

Figure 8 shows the results of the question: How often would you use the mobile app? Where 11 university students indicate that always, 6 almost always, 3 sometimes. As a result, if the application is implemented, it would be well received.

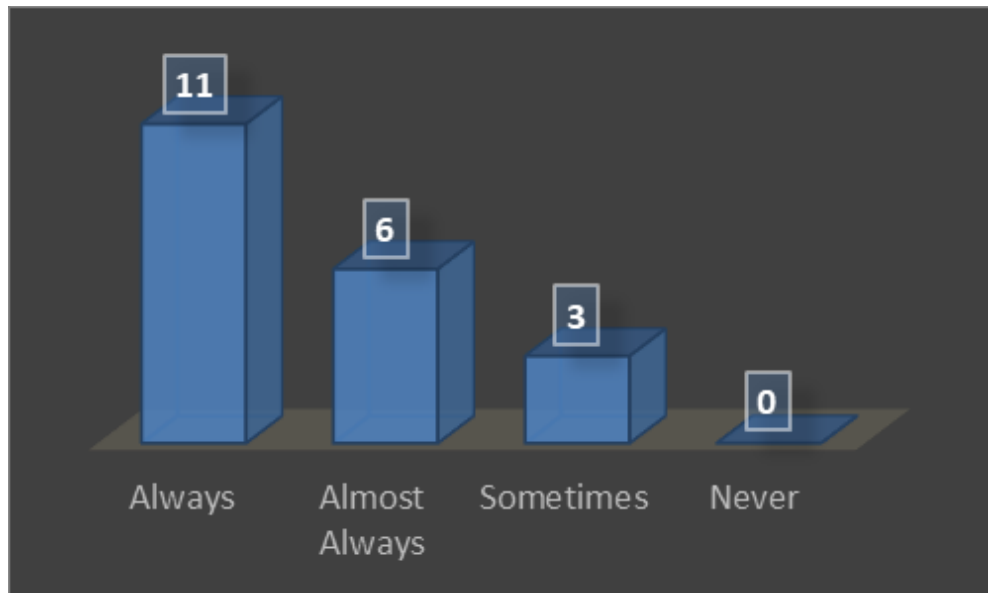


Figure 8: Frecuency of use of the application

IV. DISCUSSION

This author [10] highlights the increasing dependence of users on mobile technologies such as smartphones and tablets, which highlights the relevance and potential of a mobile application designed for university students. Their research highlights the importance of mobile apps in various contexts, including education, supporting the feasibility and utility of the mobile app proposed in the research title.

The author [11] points to the need for health promotion interventions targeting young populations, especially college students, that can address lack of physical activity and promote healthier lifestyles. This research highlights the importance of using information and communication technologies, such as WhatsApp, to reach this specific demographic, which aligns with the goal of designing a mobile app for college students in emergency situations, as this app could also integrate features related to health promotion.

The author [12] emphasizes the role of the Internet as a primary source of information for college students, especially on health issues. However, it also highlights concerns about the reliability of online information, underscoring the importance of designing a mobile app that provides accurate and reliable medical information for college students in emergency situations. This research highlights the need to provide a reliable alternative to online information, reinforcing the relevance and importance of the proposed research project.

V. CONCLUSION

Research on the mobile app for college students in emergencies highlights the importance of using technology to promote safety and well-being on campus. By integrating geolocation features and medical information, this app offers an innovative solution to address the specific needs of students. It is crucial to ensure the accuracy of the information and promote the active use of the app among the student community. In summary, this project has the potential to significantly improve the safety and health of university students, as well as contribute to the advancement of research in the field of digital health and campus safety.

REFERENCES

- [1] Armendariz Onofre, L. D. L. Á., & Calle Borbor, A. C. (2021). Diseño de la interfaz gráfica de una aplicación móvil de ayuda en casos de emergencias causadas por la ansiedad para los estudiantes de la Facultad de Arte, Diseño y Comunicación Audiovisual (Doctoral dissertation, ESPOL. FADCOM.).
- [2] Bustos, M. A., Perez, N. B., & Berón, M. M. UNIVERSITARIOS APP: UNA APLICACIÓN PARA ESTUDIANTES UNIVERSITARIOS. Escenarios Digitales en la Universidad Nacional de San Luis
- [3] Vergara Peñailillo, M. M., Beytia Valenzuela, N. A., & Sanhueza Araya, G. I. (2018). Efecto de una intervención en promoción de salud a través del uso de la aplicación Whatsapp en el nivel de actividad física de estudiantes universitarios de la Universidad Católica de la Santísima Concepción. Un estudio clínico aleatorio (Doctoral dissertation, Universidad Católica de la Santísima Concepción).

- [4] Cajo, B. G. H., & Gavidia, E. P. M. (2019). Internet un medio de consulta a problemas de salud en estudiantes universitarios. *Revista Caribeña de Ciencias Sociales*, (2019-03).
- [5] Vargas Almonte, E. C., & Cayetano Márquez, J. A. (2023). Encuétrame RD-optimización del proceso de búsqueda de personas desaparecidas en hospitales y destacamentos: apoyo a través de aplicación móvil y web (Doctoral dissertation, Santo Domingo: Universidad Iberoamericana (UNIBE)).
- [6] Palmero, J. R., Magaña, E. C., Rivas, E. S., & Valenzuela, T. L. (2021). Estudio del uso y consumo de dispositivos móviles en universitarios. *Digital Education Review*, (39), 89-104.
- [7] García Muñoz, W. G., & Melo Gutiérrez, L. H. (2022). Aplicación Móvil para la Geolocalización en el Interior del Edificio Alfonso Palacio Rudas de la Universidad Piloto de Colombia, Utilizando Redes Inalámbricas como Apoyo a la Movilidad de Personas con Limitación Visual, Estudio de Caso.
- [8] Torres, A. B., Rodríguez, A. R., Requena, D. V., Rodríguez, J. M., Mendoza, J. H., & Rodríguez, W. R. (2020). Aplicación móvil de comunicación directa para el departamento de protección civil de la UAMRR-UAT: Direct communication mobile application for the UAMRR-UAT civil protection department. *Tecnología Educativa Revista CONAIC*, 7(2), 6-18.
- [9] Sánchez, A. V. B., Navarro, C. C., Garay, N. Z., & Marcos, Á. M. M. "Doctor Found": Un prototipo para la atención médica inteligente. "Doctor Found": A prototype for intelligent healthcare. *Revista científica y tecnológica*. ISSN, 2444, 4944.
- [10] Clusman Llaza, M. A., & Saman Becerra, J. C. (2023). Aplicativo móvil para mejorar el proceso de reporte de emergencias de la tercera brigada Callao-Norte, Lima 2023.
- [11] Jarrín Peña, M., Avendaño Peralta, C. M., & Martínez Jaramillo, C. M. (2021). Diseño de una aplicación móvil para el mejoramiento de los servicios médicos veterinarios en el municipio de Cereté.
- [12] Angulo Pizan, E., & Tello Leon, J. F. (2022). Aplicación móvil basada en metodología Mobile-D para mejorar la atención de emergencias en la división de seguridad ciudadana y serenazgo de la Municipalidad Distrital de Chicama.