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AyudaMujer: A Mobile Application for the Treatment of Violence Against Women in Peru

David Mauricio[a], Alejandro Zeña[a], Umer Avila[a], Pedro Castañeda[a], Lupe García[b] and Nelson Maculan[c]

[a]Ingeniería de Sistemas de Información, Universidad Peruana de Ciencias Aplicadas, Lima, Perú; [b]Universidad Nacional Mayor de San Marcos, Lima, Perú; [c]Department of Systems Engineering and Computer Science, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

ABSTRACT

Violence against women in Peru is a problem that has a high incidence and is increasing, despite the policies undertaken by past governments and the creation of the Ministry of Women and Vulnerable Populations in 1996, causing that one in two women have been abused at some point in their lives. However, the treatment of abused women is still insufficient even though there are more Women's Emergency Centers (WEC) each year, where victims can ask for professional support and treatment quickly and effectively. The chatbot provides an alternative to eliminate the distance between the abused woman and the WEC; therefore, a mobile application called AyudaMujer is proposed that includes a chatbot, news, a map of nearby WECs, and the connection with specialists for the treatment of violence against women. The chatbot identifies, automatically and through a natural dialogue, the type of violence and its level of risk. Additionally, it assigns a specialist to provide personalized professional treatment. The testing of AyudaMujer with 20 abused women from Lima, Peru, shows that the risk of violence is reduced by an average of 19.43% after three weeks of use. The results show that this tool can contribute to the treatment of abused women.

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KEYWORDS
Chatbot; mobile application; violence; women

Introduction

Globally, 35% of women have experienced physical or sexual violence from an intimate partner or a stranger at least once (World Health Organization [WHO], 2013). According to the United Nations Office on Drugs and Crime (UNODC), in the year 2017, 87,000 women were intentionally killed worldwide, with over half (50,000) of them being murdered by their family members or intimate partners, meaning that 137 women were killed per

CONTACT David Mauricio pcsidmau@upc.edu.pe Facultad de Ingeniería, Universidad Peruana de Ciencias Aplicadas, Lima, Perú;.

day (The United Nations Office on Drugs and Crime [UNODC], 2019). The COVID-19 pandemic has exacerbated this violence. Social isolation, restriction of movement, and economic insecurity increased the vulnerability of women to being abused around the world, causing a five-fold rise in calls to helplines in some countries (UN, 2020). In the case of Peru, there were 132 cases of femicide in 2020 (Defensoría del Pueblo, 2020).

Physical violence is one of the types of violence against women that usually creates more visible consequences, such as bruises, which affect the mental health of the victims (Tirado & Mauricio, 2021). However, there are other types of violence, such as psychological and sexual, where the main aggressor is the victim's partner (Ramirez & Mauricio, 2020). In the Middle East and North Africa, between 40% and 60% of women have experienced sexual harassment on the streets (UN Women, 2017). Teenagers are the group most at risk of suffering forced sexual relations. Only in 2016, 15 million abuses of this type were reported by 15 to 19-year-olds worldwide, and very few requested professional support (United Nations International Children's Emergency Fund [UNICEF], 2017). In January 2021, the National Penitentiary Institute of Peru (INPE in Spanish) reported 9,674 prisoners for sexual violence against minors (Instituto Nacional Penitenciario [INPE], 2022).

At least 155 countries have passed laws on domestic violence, and 140 countries have legislation on sexual harassment in the workplace (World Bank Group, 2020; Inter-Parliamentary Union, 2016). In Peru, there is Law 30364 that aims to prevent, punish and eradicate any form of violence against women by family members and in the public or private sphere (MIMP, 2016).

Women who have been abused need professional psychological treatment. However, many remain silent and do not report these events. Failure to report this kind of crime can occur for different reasons: in 14.7% of the cases, it was because they felt ashamed about what people around them would think; in 12% of the cases, it was because the victim did not know where to turn; and in 3.4% of the cases, it was because they thought they were to blame for what happened (Instituto Nacional de Estadística e Informática [INEI], 2019).

To tackle the problem of violence against women, be it physical or psychological, mobile applications have been developed that have different purposes. Some provide a tool that seeks to prevent potential situations of violence (Tamilselvi & Getrude, 2021), while others seek to empower women and develop strategies that make them feel more secure in their daily lives (Decker, Wood, Hameeduddin, et al., 2020). Also, there are applications that make it easier for women to identify if they are in a healthy relationship or not (Alhusen, Bloom, Clough, & Glass, 2015). On the other hand, chatbots have been developed that seek to tackle violence against women in different ways.

Some chatbots seek to inform women about the laws that exist and how they could act based on them (Monalisa, Himi, Ferdous, Islam, & Majumder, 2021), while others seek to provide treatment to victims of sexual violence (Park & Lee, 2021). Even some chatbots provide timely information to women going through a critical situation so they can make better decisions (Hossain, Najib, & Islam, 2020). However, these chatbots present limitations as information is not found in Spanish, so it would be difficult for some Peruvian women to understand it. Also, these are not usually oriented to all types of violence and are unable to connect the victims with a specialist capable of providing psychological treatment. In Peru, no mobile applications and chatbots have been identified for the treatment of violence against women as of the date of this study.

In this study, a mobile application is proposed to quickly and anonymously connect women victims of violence with specialists in physical, psychological, or sexual violence. A chatbot is included that, through a dialogue with the victim, will identify the type of violence and level of risk, then the application determines a specialist who can assist her. In addition, thanks to this application, the woman will be able to view the Women's Emergency Center closest to her location.

This work is organized into five sections. Section "Introduction" presents a brief literature review of chatbots on violence against women. The proposed mobile application is described in Section "Literature Review", with its architecture and development process. The validation of the mobile application through usability and effectiveness, as well as the results, are presented in Sections "Method" and "Results", respectively. Finally, the conclusions follow in Section "Conclusion".

Literature review

Next, we review mobile applications that are not chatbots and chatbots on violence against women.

Mobile applications that are not chatbots on violence against women

A mobile application is a program with special characteristics installed on a small mobile device, either a tablet or smartphone, with which the user interacts *via* a touch-based interface (Sánchez Rodríguez, Collado Vázquez, Martín Casas, & Cano de la Cuerda, 2016). Since 2013, mobile applications on violence against women have been developed. In (Lindsay et al., 2013), a mobile application is developed with the objective that women can identify if they are at risk of suffering some type of violence in their current relationship. The 36 participating university women from the cities of Arizona, Oregon, Missouri and Maryland, point out at the end of the

study that the application has a high potential to provide personalized information about an abusive relationship. In (Alhusen et al., 2015) the mobile application is intended to help women victims of dating violence, and they support its usefulness with tests with 31 university women victims of this type of violence. In (Fernández & Bawica, 2017) a mobile application is proposed with several functionalities, such as allowing you to send the location to family members, providing government help lines, and information on laws on violence against women. In (Udmuangpia, Shawong, Kammanat, & Bloom, 2020), the mobile application prevents situations related to violence against women in Thailand through safety planning, and they show with 67 participants that prevention is feasible. In (Decker, Wood, Hameeduddin, et al., 2020), the 'MyPlan' mobile application was adapted to support Kenyan women in making safety decisions with support from trained professionals. The 3-month tests of 177 participants who used the application showed greater control over security strategies than the group of 175 participants who did not use the application. Furthermore, (Decker, Wood, Kennedy, et al., 2020) shows that this application has a high rate of acceptability, even in places with low resources, which is why they conclude that this type of technological applications can contribute to the fight against violence against women. In (Bagwell-Gray et al., 2021), describes the adaptation of a safety web application called myPlan (renamed ourCircle), for Native American women exposed to intimate partner violence, considering the culturally specific risk and protective factors of intimate partner violence, and infuses culturally specific safety priorities and strategies.

In (Potter, Moschella, Smith, & Draper, 2020) they examine a sample of students from 7 community colleges in the USA, the reasons for downloading a mobile application for prevention and response to violence (uSafeUS), and identify that the participants who downloaded uSafeUS had more more likely to perceive that they were safe from sexual violence on their college campus than participants who did not download the app. In (Yadav, Sharma, & Gupta, 2021) a safety device for women, called SafeWomen, is presented, which helps reduce crimes committed against women by sending a geo-located alert along with an emergency message to the numbers contact details registered so that the incident can be prevented, in addition, it allows tracking through the IP address of the device you are using. In (Tozzo, Gabbin, Politi, Frigo, & Caenazzo, 2021), the probability of a woman downloading mobile applications about violence against women is investigated, and they show that, of a group of 1,782 Italian university students, 79.5% of women would be willing to download this type of application. In (Tamilselvi & Getrude, 2021), the government-driven application from New Delhi, "Kavalan," is presented, which serves as a channel to contact the police when one is a victim of violence,

regardless of location. It shows that about 150 individuals, 52.7% of whom indicate that such applications help combat violence against women.

Chatbots on violence against women

While it is true that mobile applications on violence against women help women feel more secure and empowered, the vast majority do not allow them to have a conversation where they can recount those bad experiences and receive professional psychological treatment. Chatbots are an emerging alternative to facilitate this communication. A chatbot is a computer program that simulates a human conversation with an end user, which may employ conversational AI techniques, such as natural language processing (NLP), to comprehend users' inquiries and automate their responses (IBM., 2024). These programs were designed to interact easily with different users using a fluent language like humans (Gros Salvat, Escofet Roig, & Payá Sánchez, 2020) and can be applied in various fields of health and other areas (Omarov, Narynov, & Zhumanov, 2023). Therefore, it can also help women victims of violence by communicating with them, obtaining relevant information without making them uncomfortable, and, in turn, providing them with ad hoc treatment (Maeng & Lee, 2022). However, a chatbot search in scientific journal articles indexed in Scopus, Web of Science, and PubMed only identifies three studies showing chatbots on violence against women (see Table 1).

Finally, searching for articles in journals indexed in Scopus, Web of Science, and PubMed using the string "(violence OR aggression) AND (woman OR girl) AND (chatbot OR 'mobile app')" reveals that as of the date of this study, in the context of Peru, only the work of Pickman-Montoya, Delzo-Zurita, Mauricio, and Santisteban (2023) presents a web-based system that includes a chatbot to empower girls. Thus, there are no studies on mobile applications and chatbots for addressing violence

Table 1. Chatbots related to violence against women.

Features	SuperWoman (Monalisa et al., 2021)	NamuBot (Park & Lee., 2021)	Conversational Interactive Response (Hossain et al., 2020)
Informative	Provides information about laws on violence against women.	No	Provides information about laws on violence against women.
Psychological treatment	No	Yes	No
Help in decision making	The chatbot suggests how to act based on laws and what happened.	The chatbot lightens the negative burden of the victim through an anonymous conversation.	The chatbot answers basic questions, and if it identifies an aggression attempt, it sends an alert.
It covers physical, psychological, and sexual violence.	Physical, psychological, and sexual violence.	Sexual violence	Physical violence
Language	English and Bengali	English	English

against women in Peru. Furthermore, no applications or chatbots have been identified in the Ministry of Women and Vulnerable Populations of Peru (https://www.gob.pe/mimp).

Method

The method for constructing the proposed mobile application (AyudaMujer) has followed three phases. Firstly, a conceptual model of the mobile application was designed, providing a visual and structured representation of the idea and functionalities of the application, additionally, describing each of the modules of the model. Secondly, the conceptual model was implemented, defining its architecture, development, and its modules. Thirdly, the validation of the application is designed to evaluate its effectiveness in the treatment of violence against women, considering the victims, instruments, and the experiment.

AyudaMujer model

A mobile application is proposed to provide adequate psychological support to victims of violence against women through a chatbot module that identifies the type of violence suffered and the current level of risk of the victim. Additionally, the chatbot module will assign a specialist to provide professional treatment to the woman remotely. Furthermore, the mobile application contains a news module that informs about violence against women and a module that locates the closest WEC to the victim's location so that the victim can receive help in person. Finally, the mobile application has a feedback module so that specialists can register suggestions regarding the content of the displayed news.

As shown in Figure 1, there are two types of users in the application flow. The victim is the woman who suffered or is suffering physical, psychological, or sexual violence, and the specialist is a professional specialized in violence against women.

The process begins when the victim accesses the AyudaMujer application through their smartphone. Then, the chatbot will have a dialogue with the victim to identify the type of violence experienced and her level of risk. Then, considering this information, a specialist in her type of violence will be assigned to her so that she can receive appropriate professional treatment. This communication will be carried out through a victim-specialist chat, where text, audio, or video messages can be sent. Additionally, the victim will be able to view the news relevant to her problem and the WEC closest to her location. Additionally, specialists will be able to suggest feedback about the news content to improve its information quality. Table 2 briefly explains each of the modules of the model.

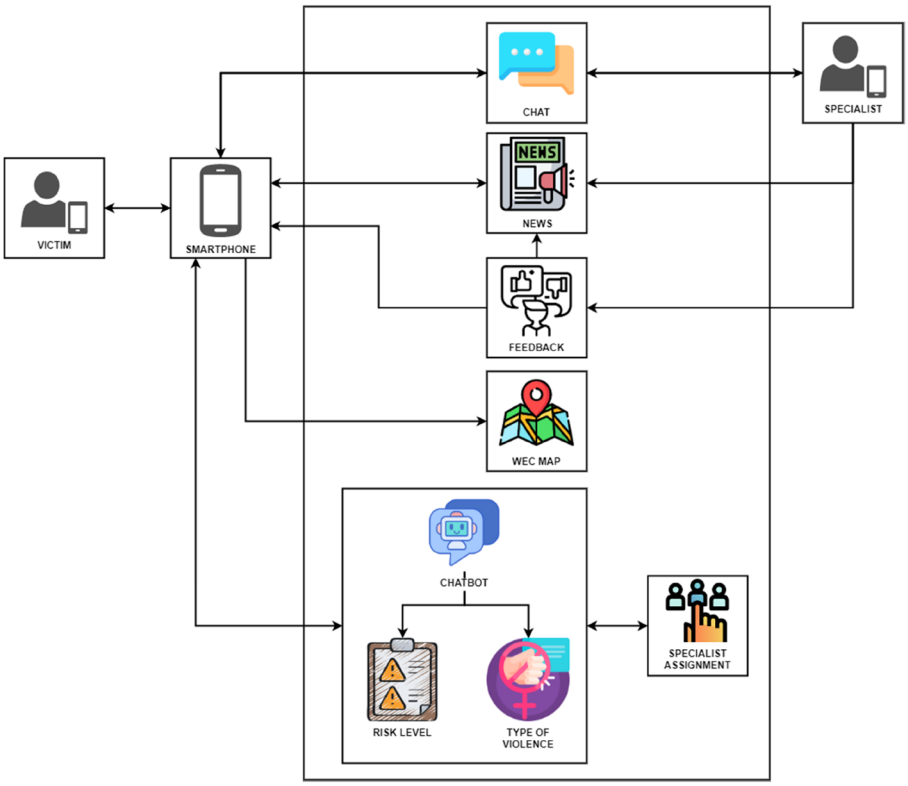


Figure 1. AyudaMujer mobile application model.

Table 2. Modules of the AyudaMujer model.

Module	Description
Chatbot	This module identifies, through dialogue, the type of violence (physical, psychological, and sexual) and the level of risk of the victim (mild, moderate, severe, or very severe). The levels of risk considered are those used by the WEC, and the dialogue to identify it in a victim is given in annex A of law 30364 "Guide to Comprehensive Care of Women's Emergency Centers" (El Peruano, 2015). This way, the necessary parameters are obtained to provide professional and personalized treatment without needing more personnel.
Specialist Assignment	This module is responsible for assigning a specialist to the victim according to the type of violence suffered. Attention to victims is done by prioritizing the victim's risk level and the availability of specialists.
Chat	This module consists of a conversation space where the victim can communicate with her assigned specialist. If the victim needs to talk to someone urgently and her assigned specialist is offline, she can talk to another specialist online. Additionally, the chat allows you to make video calls, attach photos or files, and send text or voice messages.
News	This module contains relevant news related to violence against women. The news module will be useful and informative for the application users. When some news is selected, it is redirected to the page where it belongs. This section will reduce the lack of information regarding violence against women.
WEC Map	This module provides an interactive map that shows the closest Women's Emergency Centers to the victim's location, according to the application's GPS. This is beneficial since many women victims of violence do not know where to go or if there is a WEC close to their home or location.
Feedback	This module allows the specialist to register functionality feedback or news synthesis and suggest changes to improve the application.

The chatbot has two main functions: calculating the level of risk and determining the type of violence. The level of risk is determined through cumulative scores of the answers to a questionnaire about the risk of violence in women, according to Table 3, in three levels (mild, moderate, and severe). The questionnaire used is the one established by Law 30364, "Guide to Comprehensive Care of Women's Emergency Centers" (El Peruano, 2015), and which is presented in Appendix A. This information will help the specialist to provide more appropriate treatment.

The types of violence considered are physical, sexual, and psychological. These are determined by identifying one or more keywords associated with the type of violence (see Table 4), which is obtained through dialogue in natural language with the chatbot.

On the other hand, news and information about violence against women have a positive effect on women when they inform them about services so they can be assisted, for example, contacting the police (Tamilselvi & Getrude, 2021), providing self-care advice (Maeng & Lee, 2022), and educating about gender-based violence (Pickman-Montoya et al., 2023). It is worth noting that news can also have a negative effect on women; therefore, they should be selected and recorded by specialists.

AyudaMujer Implementation

Architecture

The architecture of AyudaMujer (see Figure 2) consists of a frontend and a backend; in addition, it contemplates two types of users: victims and specialists. These users will be able to access the mobile app through a smartphone and a Wi-Fi connection.

In the implementation, Amazon lex, Flutter, and SpringBoot were used for the Chatbot module. The Chat module was implemented using Stream. io, SpringBoot, and Flutter. The Specialist Assignment module was implemented using Flutter and SpringBoot. The News module was implemented

Table 3. Scores by risk level.

Level of risk	Score
Mild	0–7
Moderate	8–13
Severe	14–37

Table 4. Types of violence and keywords.

Types of violence	Keywords
Physical	weapons, injuries, blows, shoves, kicks, slaps, non-accidental damage, pulling, object, punching
Sexual	vaginal, anal, oral, rape, sexual
Psychological	slander, screams, insults, disdain, mockery, irony, control situations, humiliations, threats, self-esteem

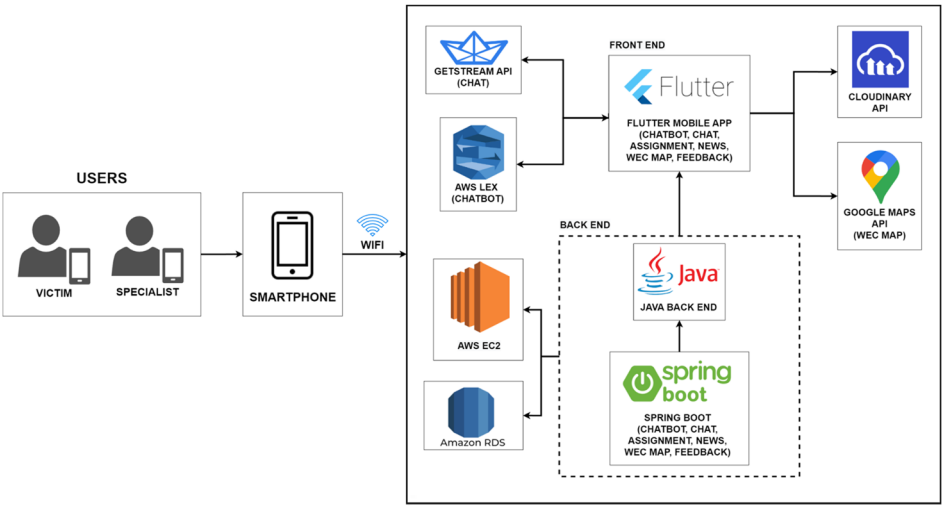


Figure 2. Architecture of the AyudaMujer mobile application.

with Flutter and SpringBoot. The WEC Map module was implemented using Google Maps API, SpringBoot, and Flutter.

Development

The frontend was developed using Flutter with the GetX design pattern. On the Backend side, it was developed on the Spring Boot Framework and deployed using Heroku. For the creation of the chatbot, 3 AWS components were used: Amazon Lex, Amazon Lambda, and Amazon DynamoDB. Likewise, a conversation flow was developed to determine the victim's type of violence and criticality using Amazon Lex. Similarly, Amazon Lambda was used in conjunction with Amazon Lex for score calculation to determine the victim's risk level based on their responses. Finally, Amazon DynamoDB, a relational database, was used to store the project schema and the application information. The specific terms of the chatbot language are those given in Law 30364 "Comprehensive Care Guide for Women's Emergency Centers" (El Peruano, 2015), an extensive document of 33 pages and 125 articles. This document addresses: (1) Guiding principles; (2) Approach to the law (gender, integrality, interculturality, human rights, intersectionality, generational); (3) Subjects of the Law; (4) Types of violence that can be reported; (5) Spaces where violence occurs; (6) Who can report; (7) About the complaint; (8) Stages of the protection and sanction process; (9) Who are public officials or agents; (10) The rights of the victim; (11) The labor rights of the victim; and (12) Rights in the field of education.

In addition, three APIs were used. Steam.io was used to achieve the conversation *via* chat between the specialist with the victim. Google

geocode was applied so that, on google maps, all the closest Women's Emergency Centers would be displayed based on the user's location. Finally, Cloudinary was used to store the certificates of cloud specialists.

Modules

AyudaMujer was implemented in six modules, which are described below.

Chatbot Module. This module aims to identify the type of violence and level of risk that the victim has been suffering through dialogue in natural language. Figure 3(A) shows the chatbot asking questions to identify the type of violence the victim suffered through keywords. Figure 3(B) shows a series of questions based on the questionnaire established by Law 30364 (see Appendix A) to identify the criticality of the situation where the woman finds herself.

Specialist Assignment Module. Through this module, a specialist is assigned to a victim depending on the type of violence the victim has suffered. To do this, the algorithm identifies all the specialists that are available and with experience in this type of violence; thus, it performs a random assignment.

Chat Module. Once the specialist is assigned, this module, which uses the stream.io.se API, establishes direct communication between the victim and the specialist. If the specialist is offline, the victim may request support from another specialist on the list who is available at that time (see Figure 4).

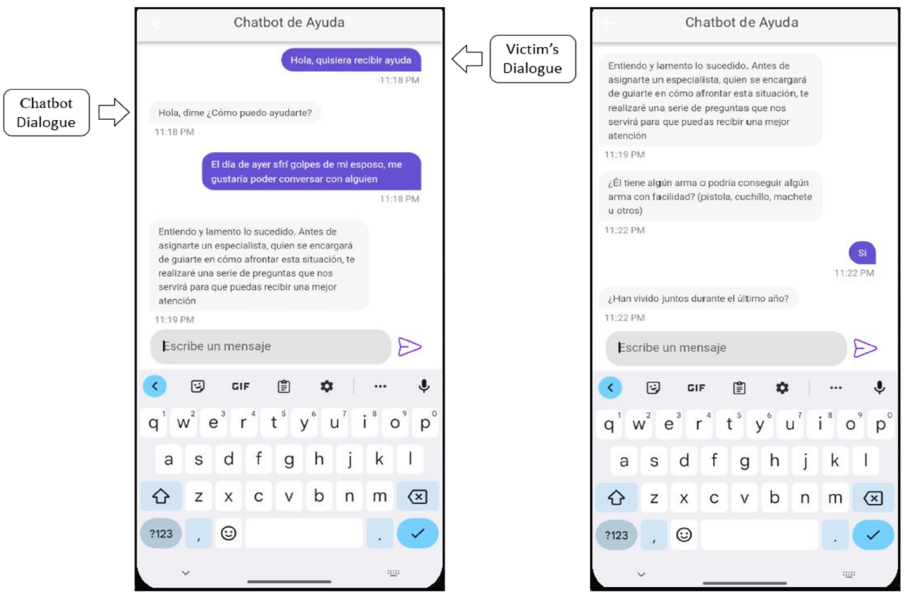
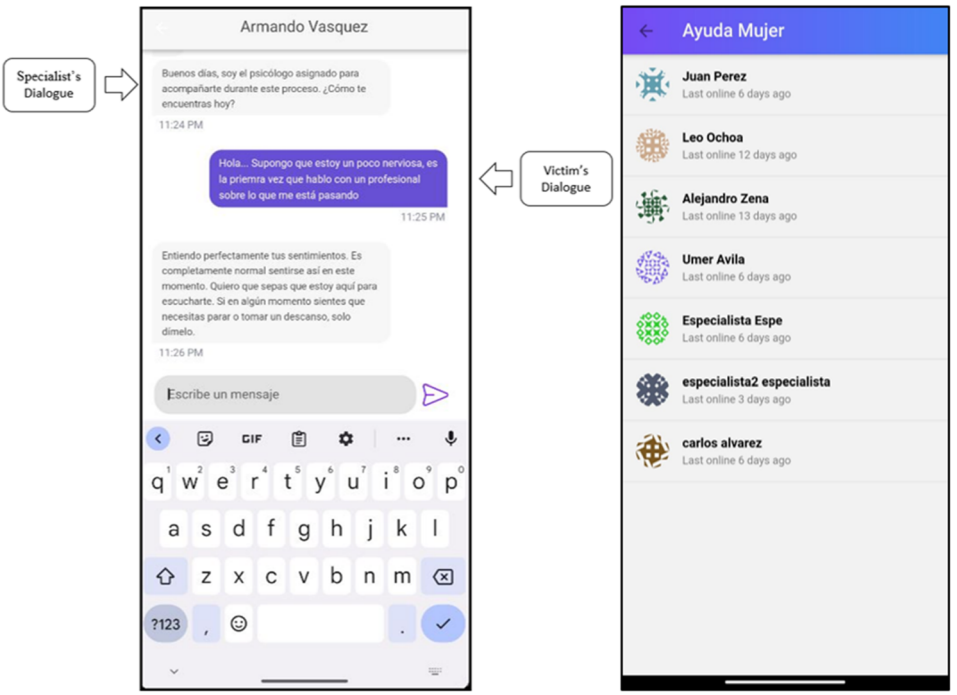


Figure 3. Identification: (A) type of violence; (B) level of risk.



(A) (B)

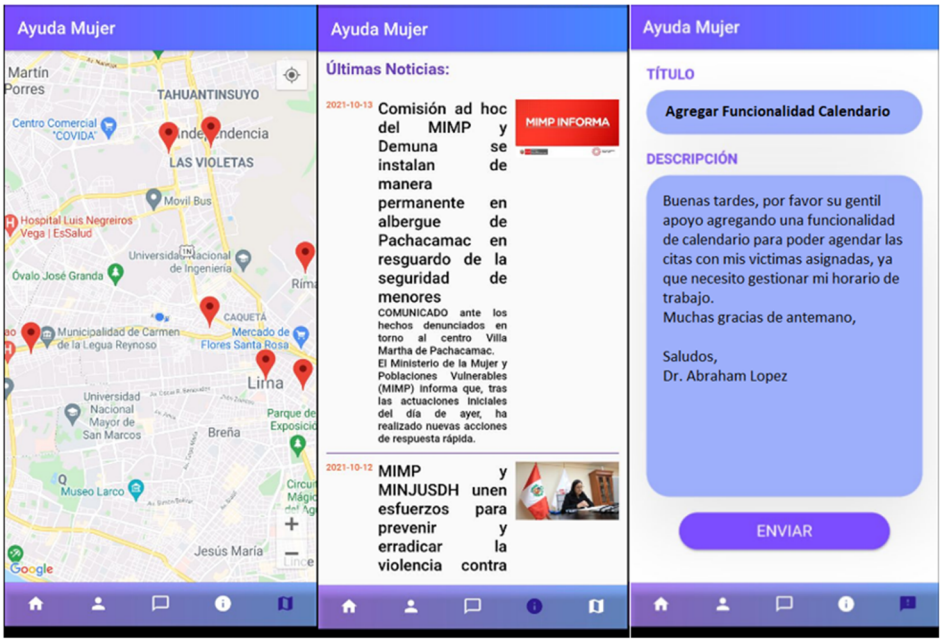
Figure 4. Chat module: (A) victim-specialist dialogue; (B) list of available specialists.

WEC map. The purpose of this module is that victims can quickly locate the nearest women's emergency center based on their location. For this, there is a section that shows the current location of the victim and the closest center marked in red (see Figure 5(A)).

News module. This module presents current news about violence against women through titles, images, and texts, which can also be redirected to the source (see Figure 5(B)).

Feedback module. It is aimed at specialists, who can provide suggestions on the operation and functionalities of the application for its continuous improvement. This is done using a form, as shown in Figure 5(C).

It should be noted that AyudaMujer was developed following the agile Scrum methodology, i.e., there was participation in the design, development and testing of a team of stakeholders given by one psychologist specialist and four women (none of them part of the experiment). In addition, the application was certified regarding its deployment in production by the virtual company Data Center of the Applied Science University.



(A) (B) (C)

Figure 5. Interfaces: (A) WEC map; (B) news; (C) feedback.

Validation

To evaluate the AyudaMujer mobile application, the efficacy in the treatment of violence against women has been considered; that is, the variation in the risk of violence between the start of treatment and after three weeks, the higher and more positive it is, the greater the effectiveness of the application.

A team of six specialists was assembled, who invited the participants, provided information about the study to each participant, ensured their understanding, voluntary consent without financial or other compensation, and formalized their agreement through a written and signed document. Additionally, the guidelines of Law 29733—Personal Data Protection Law (*El Peruano*, 2011) have been followed, thus ensuring the confidentiality and privacy of the data, and ethics. The team consists of 1 psychologist with 14 years of experience in violence against women and 5 social workers with 22 years of professional experience.

Victims

Twenty-seven women residing in Lima, Peru, who have experienced physical, sexual, or psychological violence, were invited to participate, of whom 20 accepted to participate, including five university students, eight with completed school studies, and seven without completed secondary

education (see Table 5). All of them sought assistance at one of the 60 Women's Emergency Centers in Lima, which are part of the Ministry of Women and Vulnerable Populations (MIMP, 2019).

Experiment

The specialists were trained on the benefits, functionalities, limitations, and case examples of the AyudaMujer mobile application in a 1-h session held in the first week of September 2021. The specialists installed the application on the victims' cell phones and although the application is intuitive and easy to use (i.e., it does not require training to use), they trained the victims in the basic functionalities of the application to verify that it is easy to use and that the victim owns a smartphone (in Peru, smartphone ownership among women was 69% in 2021 [OPSITEL, 2023]). Additionally, the specialists requested that the victims use the application three times a week for three weeks as part of their treatment, totaling nine times throughout the experiment.

On the first day, the risk level (initial risk) of each of the victims was determined and a group of victims was assigned to each specialist, this was done through the AyudaMujer chatbot module. During the 3 weeks, the victims had their therapies with their assigned specialist and used the application. At the end of the three weeks, victims were asked to complete the chatbot module questionnaire again to determine their risk level (final risk).

Results

Figure 6 shows the risk level of each victim at the beginning and end of the experiment, where it is observed that 18 out of the 20 victims experienced an improvement in their risk level. The victims who did not show improvements in their risk level are M01 and M04. Victim M01 maintained her risk level of 5 (low), so an improvement or worsening of the risk by 10% (significant) is not possible to visualize. In the case of victim M04,

Table 5. Sample of victims.

Id	Age	Occupation	Education level	Id	Age	Occupation	Education level
M01	20	Student	University	M11	52	Merchant	CHS
M02	21	Student	University	M12	29	Merchant	CHS
M03	22	Student	University	M13	38	Merchant	CHS
M04	21	Student	University	M14	45	Merchant	UCH
M05	21	Student	University	M15	48	Merchant	UCH
M06	32	Merchant	CHS	M16	53	Merchant	UCH
M07	41	Housekeeper	CHS	M17	39	Housekeeper	UCH
M08	30	Housekeeper	CHS	M18	32	Merchant	UCH
M09	45	Merchant	CHS	M19	51	Merchant	UCH
M10	51	Merchant	CHS	M20	42	Housekeeper	UCH

CHS: Completed high school; UHS: Uncompleted high school.

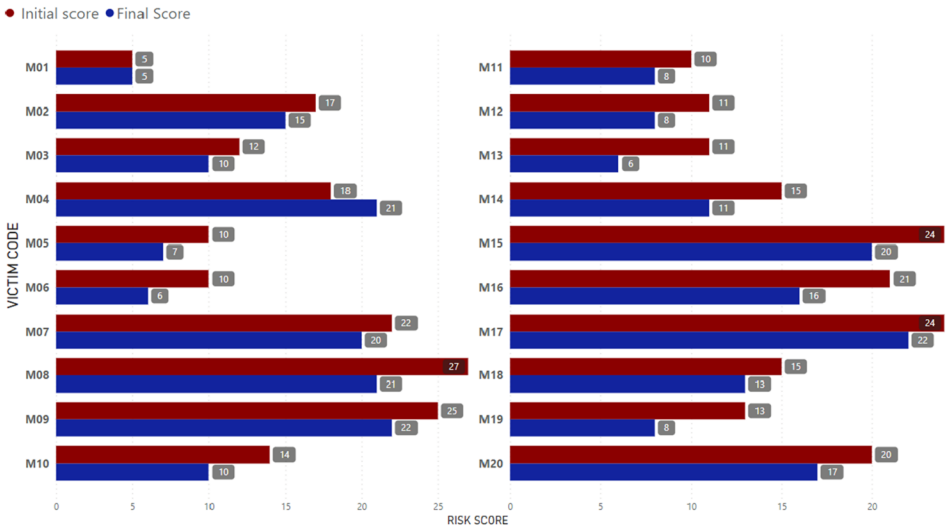


Figure 6. Risk level before and after using AyudaMujer for 3 wk.

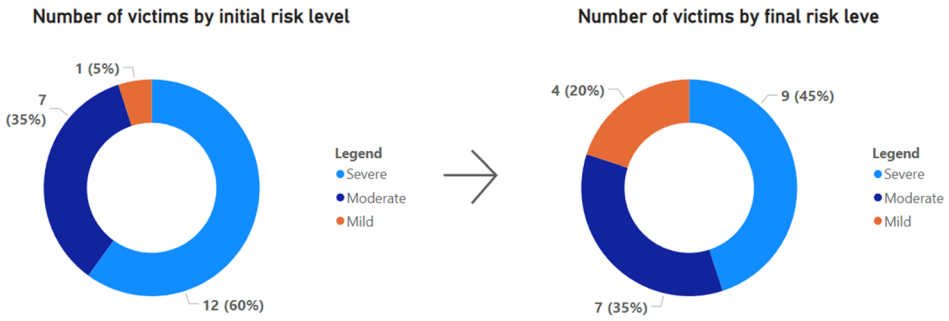


Figure 7. Number of victims by level of risk.

who showed an increase in risk level, she did not demonstrate a predisposition to use the application; she only used it twice during the trial period when she should have used it 9 times. It should be noted that the effectiveness of treatment for victims of violence does not always reach 100%, and there is generally dropout in health treatment, for example, in partner violence (Craven, Fields, Carlson, Combs, & Howe, 2023), pediatric overweight and obesity (Huapaya, Marin, & Mauricio, 2021).

Figure 7 shows the number of victims by risk level at the beginning, and after using AyudaMujer, this is obtained from the scores by risk level (see Table 3 and Figure 6). It can be seen that the number of victims of the severe risk level decreased from 12 to 9 in the test period, while the moderate level remained at seven victims. Likewise, the mild level varied from 1 to 4 victims. This suggests a positive relationship between the use of the application and a possible improvement in the level of risk.

Table 6. Results of the efficacy evaluation.

Id	Initial score	Final score	Variation (%)	Id	Initial score	Final score	Variation (%)
M01	05	05	0.00	M11	10	08	20.20
M02	17	15	11.76	M12	11	08	27.27
M03	12	10	16.67	M13	11	06	45.45
M04	18	21	−16.67	M14	15	11	26.67
M05	10	07	30.00	M15	24	20	16.67
M06	10	06	40.00	M16	21	16	23.81
M07	22	20	9.09	M17	24	22	8.33
M08	27	21	22.22	M18	15	13	13.33
M09	25	22	12.00	M19	13	08	38.46
M10	14	10	28.57	M20	20	17	15.00

Finally, the results of the efficacy of the mobile application are shown in Table 6, where the variation in the level of risk between the initial and final scores determines the efficacy. For example, M02 presents a positive efficacy of 11.76% since it has reduced its risk level from 17 to 15. On average, the risk level has been reduced by 19.43%, where the greatest reduction of 45.45% occurs in victim M13. This indicates an association between the use of the application and the reduction in the level of risk.

Conclusion

This work has proposed a technological model and a mobile application called AyudaMujer to remotely provide professional psychological treatment to women victims of psychological, physical, or sexual violence. This mobile application includes a chatbot, connection with specialists, news, and a map of the nearest Women's Emergency Centers. In contrast to other mobile applications, the proposal, through a dialogue in natural language with the victim, automatically determines the type of violence they have suffered and their current level of risk, essential information for the designation of a specialist and the respective treatment.

The mobile application was implemented using Flutter with the GetX design pattern for the frontend and Spring Boot Framework for the back-end, as well as Amazon DynamoDB for the database. Regarding the chat-bot, 3 AWS components were used: Amazon Lex, Amazon Lambda, and Amazon DynamoDB. Subsequently, AyudaMujer was used on 20 women victims of acts of violence so that they could receive treatment from 6 specialists, from which it was demonstrated that the mobile application is efficient since 18 of the 20 victims decreased their level of risk, on average, 19.43% after three weeks of testing. This suggests a relationship between application use and decreased risk level.

A limitation of the mobile application is that the determination of the type of violence and the level of risk is based on the official questionnaire given by Peruvian law 30364, which is why the proposal is focused on Peru. Therefore, its use in other countries must contemplate different

regulations and adjust the mobile application. Several future works can be developed, including understanding the impact of AyudaMujer on the treatment of women victims of violence, adding automatic monitoring of victims through the chatbot, which could help specialists adjust their treatments, and identifying the adoption factors of the proposed application, which would help promote its widespread use.

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ORCID

David Mauricio http://orcid.org/0000-0001-9262-626X
Pedro Castañeda http://orcid.org/0000-0003-1865-1293
Lupe García http://orcid.org/0000-0002-1204-660X
Nelson Maculan http://orcid.org/0000-0002-3897-3356

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Appendix A.

Risk assessment sheet for women victims of intimate partner violence (in Spanish)

		SÍ	NO
1.	¿En el último año, la violencia física contra usted ha aumentado en gravedad o frecuencia?	1	0
2.	¿Él tiene algún arma o podría conseguir un arma con facilidad? (pistola, cuchillo, machete, u otros)	5	0
	2a. ¿Han vivido juntos durante el último año? [si dice NO, pasar a pregunta 4]		
3.	Usted me dice que han vivido juntos en el último año. ¿Siguen viviendo juntos o lo ha dejado? [Si siguen viviendo juntos marcar SI; si luego de vivir juntos lo ha dejado marcar NO]	0	4
4.	¿Actualmente, él tiene trabajo estable? [si ella no sabe, no marcar nada]	0	4
5.	¿Alguna vez él ha usado o la ha amenazado con un arma (pistola, cuchillo, machete u otros)?	3	0
	5a. Si su respuesta fue "SI", ¿fue con una pistola o cuchillo?: ____		
6.	¿La ha amenazado con matarla?	3	0
7.	¿Alguna vez usted lo denunció por violencia familiar (porque él le pegó) ante la comisaría, fiscalía, juzgado o ante alguna autoridad comunal?	3	0
8.	¿Él la ha obligado alguna vez a tener relaciones sexuales?	2	0
9.	¿Él ha intentado ahorcarla?	2	0
10.	¿Él consume drogas? Por ejemplo, como la marihuana, pasta básica, cocaína u otras.	1	0
11.	¿Él es alcohólico o tiene problemas con el alcohol (trago o licor)?	1	0
12.	¿Le controla la mayoría o todas sus actividades diarias? Por ejemplo, no le deja que vea a sus familiares o amistades, le controla cuánto dinero puede gastar, etc.	1	0
	12a. Si él trata de controlarla pero ella no lo permite, márquelo aquí: ____		
13.	¿Él se pone celoso de forma constante y violenta? Por ejemplo, le dice: "si no eres mía, no serás de nadie" u otras similares.	1	0
14.	¿Cuándo usted estuvo embarazada, alguna vez él la golpeó?	1	0
15.	¿Alguna vez él ha amenazado o ha intentado suicidarse?	1	0
16.	¿Él la ha amenazado con hacerle daño a sus hijos?	1	0
17.	¿Cree que él es capaz de matarla?	1	0
18.	¿Él realiza alguna de las siguientes acciones?: La llama insistentemente, le deja mensajes en su teléfono o en redes sociales o destruye sus cosas (celular, ropa u otro).	1	0
19.	¿Alguna vez usted ha intentado o ha amenazado con quitarse la vida?	1	0
	Sumatoria de puntaje (0-37)		