RESUMO

Objetivo: elaborar um protótipo para um aplicativo móvel a fim de ampliar a disponibilidade de apoio social para as gestantes. Método: trata-se de um estudo misto, tipo transversal, realizado com gestantes usuárias da atenção básica à saúde de unidades vinculadas ao Sistema Único de Saúde (SUS). Elaborou-se, a partir dos resultados obtidos na pesquisa, um protótipo para aplicativo móvel no modelo SCRUM para sistema operacional Android. Resultados: nominou-se o protótipo de Apoia. Revelam-se as funcionalidades do Apoia de proporcionar a interação entre a gestante e as pessoas por ela escolhidas para comporem a rede social, possibilitar a troca de mensagens de apoio, resgatar a disponibilidade das pessoas em oferecer ajuda, assessorando, dessas formas, a mulher grávida no processo de viabilização do apoio social. Conclusão: acredita-se que o Apoia é um recurso inovador, com o intuito de construir e ampliar o apoio social para gestantes usuárias a partir da construção e flexibilização da rede social com o uso das tecnologias da informação e comunicação na saúde.

Descritores: Apoio Social; Gestantes; Informática em Enfermagem; Mídias Sociais; Saúde Materna; Tecnologia da Informação.

ABSTRACT

Objective: to develop a prototype for a mobile application in order to increase the availability of social support for pregnant women. Method: this is a cross-sectional, mixed study conducted with pregnant women who use basic health care in units linked to the Unified Health System (UHS). Based on the results obtained in the research, a prototype for a mobile application in the SCRUM model for the Android operating system was elaborated. Results: the prototype of Apoia was named. The functionalities of Apoia are revealed: to provide interaction between the pregnant woman and the people she has chosen to make up the social network, to enable the exchange of support messages, to rescue people's willingness to offer help, thus assisting the pregnant woman in the process of making social support possible. Conclusion: It is believed that Apoia is an innovative
resource, with the aim of building and expanding social support for pregnant users from the construction and flexibility of the social network with the use of information and communication technologies in health.

Descriptors: Social Support; Pregnant women; Nursing Informatics; Social Media; Maternal Health; Information Technology.

RESUMEN

Objetivo: desarrollar un prototipo de aplicación móvil con el fin de aumentar la disponibilidad de apoyo social para mujeres embarazadas. Método: se trata de un estudio mixto, transversal, realizado con mujeres embarazadas usuarias de atención primaria de salud en unidades vinculadas al Sistema Único de Salud (SUS). A partir de los resultados obtenidos en la investigación se elaboró un prototipo de aplicación móvil en el modelo SCRUM para sistema operativo Android. Resultados: se nombró el prototipo de Apoia. Las características de Apoia se revelan para brindar interacción entre la gestante y las personas elegidas por ella para componer la red social, posibilitar el intercambio de mensajes de apoyo, rescatar la disponibilidad de personas para ofrecer ayuda, asesorando así a la mujer. embarazada en el proceso de habilitar el apoyo social. Conclusión: se cree que Apoia es un recurso innovador, con el objetivo de construir y ampliar el apoyo social a usuarias embarazadas desde la construcción y flexibilización de la red social con el uso de tecnologías de la información y la comunicación en salud.

Descripciones: Apoyo Social; Mujeres Embarazadas; Infomática Aplicada a la Enfermería; Medios de Comunicación Sociales; Salud Materna; Tecnología de la Información.

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It is known that the use of Information and Communication Technology (ICT) in health has demonstrated benefits in caring for pregnant women with regard to the promotion of social support.\textsuperscript{1-2} ICTs are widely accepted in terms of design and maintenance cost and require few skills to handle them.\textsuperscript{3-4}

As an ICT resource, mobile applications allow access to information anywhere and at any time from the compatible cell phone.\textsuperscript{5} It is believed, in health, that these applications have the potential to improve follow-up, self-care and family participation in the health-disease process beyond the physical structure of health services.\textsuperscript{6} There is evidence that they provide resources for increased support and contribute to the health information of pregnant women, who have a substantial share in supporting these women.\textsuperscript{1}

It is therefore believed that an application that is able to help reduce social inequalities affecting the health of pregnant women has applicability. It is informed that one of these social determinants of health is social support, characterized by the construction of support received from people of coexistence, where the availability, quality and frequency of help received from people of coexistence are identified.\textsuperscript{7} Social support is evaluated by the person's perception. It can be characterized by material, emotional, information, positive social interaction and affective support so that there is some way to alleviate some mental and/or physical suffering.\textsuperscript{7-9}

Studies refer to the positive association between social support and better self-reported health indicators in pregnant women.\textsuperscript{9} This becomes important because, by perceiving herself in better health, the pregnant woman tends to rescue a general evaluation of her state of health and not merely the absence of some disease.\textsuperscript{8-10}

The scientific literature indicates that there is a positive relationship between social support and the perception of women's health in pregnancy.\textsuperscript{8,10} But, so far, we have no knowledge about the existence of any technological resource that was developed to strengthen social support in pregnancy. In this sense, the use of a mobile application can contribute to the strengthening of the support networks for the pregnant woman and her baby's well-being.

**OBJECTIVE**

To develop a prototype for a mobile application in order to increase the availability of social support for pregnant women.
It is a mixed study, transversal type, from the construction of a technological product that aims at the development of a prototype for a competent mobile application for the amplification and qualification of the social support for pregnant women based on scientific evidence. It is explained that the reference for the creation of this application was the result of the mixed research, of the transversal type, with pregnant women using the basic health care services of the city of Santa Maria, Rio Grande do Sul. This research was previously approved by the Research Ethics Committee (REC) of the Franciscan University under the report number 2,965,535 (CAAE 00407218.4.0000.5306).

The purpose of the above-mentioned research was to evaluate and understand the influence of social support on the health self-perception of pregnant women and, in all, 151 pregnant women participated in the survey. A qualitative research with 17 pregnant women was also carried out to understand the relationship between social support and self-perception of pregnant women's health. The results of the research showed that there is a positive relationship between social support and health self-perception of pregnant women.

Based on this, it is explained that the prototype elaboration is the result of a health need based on the need of the sample, which can be tested at a collective level and evidenced in field research with users of the Single Health System (UHS).

The application was created in partnership with the computer science practice laboratory of the Computer Science undergraduate course at the Franciscan University (UFN).

Application development

The mobile application was built in the following stages: a) elaboration of the research project, approval in the REC, application of questionnaires to 151 pregnant women and interviews to 17 pregnant women on social support and self-perception of health; b) data analysis: as it is a mixed study, statistical and thematic content analysis was performed; c) evidence of the influences of social support for the pregnant woman: survey of the importance of people's support to pregnant women and positive association in health self-perception; d) planning of the functionalities of the prototype from the five types of social support (affective, emotional, material, information and positive social interaction); e) construction of all functionalities: creating a virtual social network of support, connecting people; receiving and sending text messages and images; self-evaluating the perception of health and the state of well-being and generating reports of self-perception of health and well-being and, finally, f) creation of the design.
The prototype for the *Apoia* application was built for the Android operating system, since this is the system used and therefore suitable for the target audience. It is a private social network application.

It is detailed that the programming language applied was Java and the production model used was SCRUM, with development cycle and weekly meetings.\(^\text{12}\)

**RESULTS**

It is reported that the prototype for the built mobile application was named *Apoia*. The prototype was conceived to contemplate the social support to pregnancy and the possibility of prolonging the maternity, integrating itself until the two years of life of the child, this because the Stork Network, which recommends mother and child care, minimally, until the two years of age, is still a challenge for the humanization of the assistance.\(^\text{13}\)

**Application Features**

The functions of promoting and facilitating the access of pregnant women to receive support from people are presented by *Apoia*. It is added that, for this, the pregnant woman has available the functions to send ready messages, emojis and build personalized messages as desired. It is detailed that, especially, some ready messages are: "I need a hug"; "I need help"; "come visit me"; "today is appointment day" and the emojis are of kisses, love, affection, hug, happiness, sadness, anger and, besides that, the pregnant woman will also have access to send photos. It is described, in a reciprocal way, that the people of the pregnant woman's social network also have at their disposal ready sentences, such as the following: "I will visit you today"; "how is the baby?"; "how are you feeling today"?; "here is my loving embrace"; "count on me"; "how are you today?" and the same emojis, as well as the possibility of building personal messages, constituting an online chat. It shows that the perspective of interactivity lies in the exchange of messages that characterize some type of social support with the potential to make the pregnant woman feel supported, even if virtually.

The pregnant woman will be able to point out, daily, in a thermometer, her state of health, sliding between very bad, bad, reasonable, good and very good, and another thermometer will be for the self-evaluation of happiness: very sad, more or less, happy, very happy. There is the possibility, of these two items, of sharing and generating reports in order to monitor the self-perception of health, since this relates to social support and has an effect on general health. Therefore, this subjective indicator can be used by health professionals who do prenatal care.
It is clarified that another feature available in Apoia will be with health professionals who perform prenatal care: if it is in the interest of the professional and the pregnant woman, they can be part of the social network created in the application and, after certification and special registration for the health professional, start the interaction, including, contributing with the social support of information. In this case, if there is availability, the professional may interact with the pregnant woman, contributing with information, clarifying doubts, anticipating care and thus promoting the health of the pregnant woman through timely access to reliable information.

In order to start using the application, the pregnant woman needs to download it from the smartphone application store. Then, when installing and opening the application, you must register, fill out your profile and, from that, invite people from your coexistence to use the application. For interaction, all people who are interested in installing the Apoia should do so; therefore, users, after filling out the registration, are enabled to enjoy all the features.

Initially, the pregnant woman may fill in items such as the probable name of the baby, the probable date of delivery, the name of the health unit where she is prenatal, city, gestational age and insert a profile photo. These data will be displayed by the people who are part of your network and they will compose the initial screen of Apoia. Figure 1 shows this screen.

![Apoia prototype screen: identification of the pregnant user.](image)

A stopwatch with the probable date of birth will be shown on the home screen when accessing the application, which can be shared on the virtual network of the pregnant woman. On the second screen, the profile photo and the name of the pregnant woman/baby are shown, with the social
network around, with the possibility of grouping by segments: friends; family; colleagues; acquaintances and health professionals, in charge of the selection of the pregnant woman. By clicking on a group, the people connected to that group will be visualized, being able to click on a person or on the whole group to start the conversation and/or to share photos.

The self-perception health assessment scale will be shown below on the screen. The pregnant woman will be able to slide the screen, choosing the marking of very bad, reasonable, good or very good, and, if she wants, share her daily state of health with the people who make up her network. You can also generate the report on this screen, selecting by day, week, month, in order to verify your self-reported health status by period. Figure 2 shows the above mentioned screen.

![Figure 2: Apoia prototype screen: self-perception of health in pregnancy](image)

In the sequence, on the next screen, you have the functionality of sending and receiving messages, allowing the pregnant woman to share feelings, gestational demands, as well as your social network will be able to reciprocate with attention, affection and zeal in the form of messages. In figure 3, the following screen is shown.
Figure 3. Apoia prototype screen: send and receive messages.

On the sequential screen, the space for the pregnant woman to share information about her pregnancy, how she is feeling and everything she considers important to share with people, from the selection of ready sentences, emojis and the environment for online chat. You can also share photos, data about your baby’s growth and development, prenatal and pregnant life, among others.

It is important to note that after the birth of the baby, the user can continue to manage her account, updating the profile and starting to share information about the maternity, requesting help, asking for ideas, reporting doubts and emotions that she deems pertinent, as well as mentioning the milestones of her child’s growth and development for the people she considers would like to participate in these moments. Thus, it is trusted that, in the same way of the gestational period, the support network will be able to interact with material, emotional, affective, information and positive social interaction help also in the postpartum period, when the mother-baby relationship is mediated by social support, especially regarding mental health.

**DISCUSSION**

The purpose of this study was to describe the prototype creation of the mobile application Apoia. It is known that smartphone applications have the potential to provide health information to pregnant women, and pregnant women have used these resources to obtain health support during this period and during maternity.

A systematic review found the positive influence of social media on vulnerable populations to reduce health inequities through access to timely information. It is believed, therefore, that
pregnant women, considered in this period as vulnerable, can benefit from the expansion of their social network face-to-face to virtual.

It is reminded that Apoia reiterates about access barriers to people who make up the social network of the pregnant woman, such as lack of time, disposition and any limitations to face-to-face meetings, allowing, through virtual communication, the construction and maintenance of interpersonal relationships, bringing closer the connections between people and the exchange of affection.

It is reaffirmed that gestational health is not limited to access and professional health care, Therefore, the social determinants of health, such as social support, are important in health care and should be considered in prenatal care, as well as the inclusion of ICTs with potential to produce health and well-being of pregnant women, as is the proposal of the application Apoia.

It is considered that, in order to be facilitators of the self-care process, with wide access to information, adequate communication between people, providing social support, ICTs should be designed for easy, reliable and friendly use. The simplicity, accessibility and comfortable layout of the Apoia's interface were favored.

It is trusted that the possibility of generating daily reports on self-perception of health will allow the pregnant woman to present them at the prenatal consultation. It is understood that this health indicator is important because it represents the general well-being of the pregnant woman, including physical and psychological aspects.

It is admitted by the evidence of the influence of social support on the health self-perception of pregnant women that the more social support they receive, the healthier the woman is perceived during pregnancy and this is a protective factor for diseases and physical and mental comorbidities. In this sense, it appears that an ICT producing organization of the pregnant woman's social network to motivate social support has scientific support.

It is informed that by following the use of the application, the user will be able to continue receiving social support beyond pregnancy, because throughout the maternity, several situations of suffering can be alleviated by the help of people. The social support received during the puerperium and throughout the maternity can reduce mental suffering, collaborating with the prevention of maternal depression and anxiety; in turn, mothers with better mental health tend to have the healthiest mother-baby relationship and babies with the proper development.

It is trusted that Apoia, in this context, seems to be an interesting tool, since it is a complementary device to prenatal care. It is explained that, to use it, the pregnant woman and her social network of support basically need access to the internet and few skills in the use of the smartphone, resembling several popular applications, which have no cost and are easily used. One
can, by the description of the built prototype, expand the access and use by health professionals as an attempt in the benefit of maternal-infant health.

The limitations of the study are the lack of validation and evaluation of the application by experts and users in order to appreciate the usability, functionality and presentation. If carried out in the future, these could verify if there was an impact of the expansion and qualification of social support for pregnant women and if this resulted in the positive outcome of the improvement of health self-perception. It would also be possible to see the applicability in clinical practice of the measurement of daily health self-perception associated to social support, based on the reports generated by Apoia.

CONCLUSION

It is believed that expanding the social support of pregnant women through a technological product in health, such as the prototype Apoia, seems to be an innovative strategy, entrepreneurial and with potential to qualify existing resources in the lives of these women. It can be improved, by facilitating the access of pregnant women to people’s support, pregnancy and maternity because it allows contact that before was perhaps not so easily achievable.

The care of pregnant women is transferred to the health services, and therefore the production of health to the mother-baby binomial is the result of intersectoral and timely efforts. By promoting the construction of social support, it is empowered to provide various forms of help, such as the Apoia prototype proposal, a multidimensional and determinant care of maternal health.

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