

RESEARCH ARTICLE

MOROCCAN WOMEN'S EMPOWERMENT THROUGH THE USE OFAN MHEALTH SOLUTION FOR FERTILITY MANAGEMENT AND CONTRACEPTION:

Najlaa Tijani MD¹, Prof. Hassan Alami¹, Prof. Ali Idri² and Prof. Rachid Bezad¹

- 1. Maternity Les Orangers Hospital, Rabat, Morocco.
- 2. Software Project Management Research Team, Department of Web and Mobile Engineering, ENSIAS, Mohamed V University. Rabat, Morocco.

Manuscript Info

Abstract

Manuscript History Received: 20 March 2023 Final Accepted: 22 April 2023 Published: May 2023

In developing countries, limited access to family planning services, results in high rates of unintendedpregnancies and unsafe abortions leading to many avoidable maternal deaths. Unmet need for family planning «UMN» is one of the United NationsMillennium Development Goals Indicators? it evaluates women who are fecund and sexually active but are not using any methods of contraception, while reporting not desiring any more children or wanting to delay the next child. According to the Moroccan national survey for family planning published in 2018, the unmet need for family planningwas 29.2% which is high. The advent of new technological solutions created for family planning has the potential to address unmet needs in low- and middleincome countries.In Morocco, research studies are scarce in the field of Family planning and sexual health. To improve the access to family planning methods and to lower the perceived barriers to contraception use in Morocco, our team in Maternity les Orangers collaborated with the software research team of the national school for computer science ENSIAS in a research project to create a new mHealth solution tailored to Moroccan women, to help empower them to achieve their reproductive goals and contraceptive needs.

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Introduction:-

Unmet need for family planning «UMN» is one of the United Nations' Millennium Development Goals Indicators used to achieve universal access to reproductive health.

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According to the World Health Organisation this indicator provides a measurement of the ability of women in achieving their desired family size and birth spacing. It is used to assess the success of reproductive health programs. and evaluate women who are fecund and sexually active but are not using any methods of contraception, while reporting not desiring any more children or wanting to delay the next child.

The concept of unmet need points to the gap between women's reproductive intentions and their contraceptive behaviour (1).

Corresponding Author:- Najlaa Tijani MD Address:- Maternity Les Orangers Hospital, Rabat, Morocco. In developing countries, limited access to family planning services, results in high rates of unintended pregnancies and unsafe abortions leading to many avoidable maternal deaths (2).

According to the United Nations Population Fund (UNFPA) and the WHO statistics, about 20 per cent of married women of reproductive age have unmet need for family planning in these countries which is over 200 million women of reproductive age, accounting for more than 80% of unintended pregnancies.

Many studies reported that the main reasons for non-use of currently-available contraceptives include concerns about side effects, perceived low risk of pregnancy, lack of knowledge, lack of access to preferred methods, and opposition from others (partners). (2,3,4)

According to the Moroccan national survey for family planning published in 2018, 70.8% of women in reproductive age (15-49 yo) use a contraceptive method (58% use a modern method and 12,8% use abstinence during fertile periods), which means that 29.2% of this category presents an unmet need for family planning.(5)

Access and use of modern contraceptive methods has substantial health benefits. They allow birth spacing thus reducing maternal and neonatal mortality and morbidity.

Creative approaches are needed to improve access to modern planning methods, and to help in women education and motivation in this aspect.

With the development of new technologies to support healthcare systems, medical care and preventive medicine have been widely improved in the last decade and more importantly after the COVID pandemic (6).

Access to mobile phones increased exponentially around the globe and hundreds of thousands of smartphone apps have been developed and deployed, including more than 100,000 apps specifically focused on health issues (7).

The advent of new technological solutions created for family planning has the potential to address unmet needs in low- and middle-income countries. Provision of fertility awareness-based contraception apps that are easy-to-use, and available through a variety of communication technologies, could fill in a portion of this need (7).

Many family planning mobile applications are available, they provide women with daily information about their fertility status and alert them to their risk of pregnancy on fertiledays, they can also be used by women who want to achieve pregnancy and those who simply want to track their cycles, thus meeting women's needs as their reproductive intentions change over time (7,8,9).

In Morocco, research studies are scarces in the field of Family planning and sexual health. To improve the access to family planning methods and to lower the perceived barriers to contraception use in Morocco, our team in Maternity les Orangers collaborated with the software research team of the national school for computer science ENSIAS in a research project to create a new mHealth solution tailored to Moroccan women, to help empower them to achieve their reproductive goals and contraceptive needs.

Methods:-

The Software Project Management Research Team of ENSIAS in Rabat, developed an evidence-based Mobile Personal Health Record (mPHR) to provide interactive, individually tailored information and decision support for contraceptive use.(8)

Our team in Les Orangers maternity hospital, participated in the evaluation phase. We conducted a prospective cohort study in the period from September to December 2019 in Maternity les Orangers in Rabat, to assess the acceptability, feasibility and utility of this new digital solution.

Results:-

MyContraception app overview: (8)

«MyContraception»app is a patient-centred multilingual mobile app, available on playstore, free of charge. It is meant to prepare women for their contraception visits with their health care providers by delivering evidence-based contraception awareness and enhancing the overall quality of patient-oriented contraception care.

To access My contraception app, the woman needs to login, choose the language she is most comfortable with (Arabic mostly), consult «About contraception» section to learn more about available contraceptive methods, their efficiency, and side effects.

Then she needs to enter her menstrual cycle information (Fig1): The day of her last menstrual cycle, its length, and the duration of her periods which would help track and predict her menstrual period, ovulation, and fertile window.

Then she needs to take the 'Eligibility Test' (Fig 6) which is based on The WHOmedical eligibility criteria for contraceptive use (MEC), in order to obtain a list of her best-suited contraceptive methods (Fig 4), and be able to choose the one she is most comfortable with, upon which the app will be adapted to follow up on her regular use of the chosen contraception method, its side effects and success in preventing an accidental pregnancy.

A calendar is provided where her period and fertile days are notified (Fig2). Reminders can be set to help her be aware of her ovulation period, to take her pills, and schedule her medical check-ups.

She would be notified of her predicted period, ovulation or fertile interval and everytimeher menstrual cycle is abnormally long or short. She can enter or change her information (symptoms, mood, weight, temperature...) at anytime (Fig 3).

A feature was added to allow her to scan or upload pictures of her medical file, blood work or ultrasound pictures from her gallery to her medical archive available on the mobile app. Keeping records of one's family medical history, medical appointments, analyses, diagnoses, procedures, and notes within the same app, makes the information easy to access and use during check-ups or in case of emergency consults (Fig 4).



Fig 1:- Screenshots of *MyContraception app*: Menstrual cycle information.

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Fig 2:- The Calendar and notification about pregnancy risks.

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Fig 3:- Clinical notes entries, medical reports and scans upload.



Fig 4 : Medical records history and information cards for each conraception

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Fig 5:-appointments and settings

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Fig6:- Eligibility test.

«MyContraception» app Evaluation:

Our prospective cohort study was conducted in Maternity les Orangers in Rabat from September to December 2019.

70 participants were recruited from the postpartum ward. They were young women, married, between 18 and 26 years old, who had either a high school or college education, they owned android smartphones, and they were willing to participate in our study. We had 22 primiparas and 13 multiparas. They all had a singleton pregnancy. 14 had c sections, and 21 had vaginal deliveries. all Consents were obtained.

In the intervention group, there were 35 women who accepted to participate in our study. They were asked to try«MyContraception» app and answer a questionnaire during the early postpartum period and 3 months later (by phone call).

In the control group we had 35 women who received the usual information about the importance of family planning and the contraceptive methods available in our family planning facility.

Both groups were scheduled for their postnatal visit to get their contraception prescription. In maternity les Orangers, we have Hormonal, Barriers, IUDs and long acting reversible contraception 'LARCs' (injectables), that are available and free of charge.

In the intervention group: 71% found the application easy to use, the content was in layman language, the interface was fluid and the information easy to access. 85% of the participants found the information provided easy to understand.91% of them had a good health literacy, they were avid users of health applications, and used to look up information about pregnancy and childcare on the internet.So none of them had issues navigating the app. The Acceptability and security scores were (100%). 80% reported an improvement in their knowledge about their menstrual cycle, fertile periods, hormonal modifications and different contraceptive methods.(**Table 1**)

91% found that their communication with their healthcare providers improved. 85% found the app useful and were very satisfied with their experience.

They were all offered the contraceptive method of their choice, from the list of the best suited contraception methods they obtained after finishing the eligibility test.

After 3 months, we contacted all participants by phone calls. 57% of the participants declared still using the app to track their menstrual cycle, temperature, physical and mood changes. 91% were still using their chosen contraceptive method. 85% declared to be satisfied using the app for their various needs (menstrual cycle, fertility period, and contraception).

In the control group, 21/35(60%) presented to the postnatal visit and were offered contraceptive methods according to their preferences and medical history.

Only 19/35(54%) answered our phone call at 3 months, they were all using the contraception method of their choice. 16/35 (45%) were lost to follow up. 2 women in this group reported accidental pregnancies (1 miscarriage, 1 evolutive pregnancy).

Evaluation Items	N (%)
Ease of use	25/35 (71%)
Comprehension	30/35 (85%)
Use of technology	35/35 (100%)
Health literacy	32/35 (91%)
Acceptability	35/35 (100%)

Table 1:- Study results (ratios and percentages).

Security and Confidentiality	35/35 (100%)			
Patient engagement/ persistent use (after 3 months)	20/35 (57%)			
Improved knowledge	28/35 (80%)			
Improvement in the quality of patient- doctor	32/35 (91%)			
interactions during counselling encounters				
6 6				
usefulness	30/35 (85%)			
Use of contraception after 3 months	32/35 (91%)			
Number of accidental pregnancies after 3 months	2/35 (5.7%)			
Satisfaction	30/35 (85%)			

Discussion:-

In Morocco, our unmet need for family planning indicator is still high compared to high income countries (29.2% in 2018) despite the government efforts (information campaigns, contraceptive methods available and free of charge in all healthcare centres) (5).

Maternity les Orangers in Rabat, is one of the WHO collaborating centres in North Africa. We evaluate and adapt WHO programs to the Moroccan population.

Family planning is an important domain in sexual and reproductive healthcare. The WHO released many recommendations and handbooks to help improve family planning indicators in Low and Middle income countries. Although, the implementation of these guidelines face many challenges such as misinformation, cultural barriers and distorted beliefs about contraceptives methods side effects and efficacy (2,3).

New solutions to address unmet needs in these countries are crucial to meeting this important milestone.

Many studies showed that mHEALTH technology offers new alternatives to healthcare providers and women in reproductive age to help manage their sexual and reproductive health. Mobile phone apps have rapidly expanded in scope, sophistication, and reach, offering a unique opportunity to put tools for pregnancy prevention in the pockets of millions of patients (6,7).

Through our project we tried to contribute to the global effort to make family planning tools available to the Moroccan population.

Our digital solution was created for all women following up in les Orangers Maternity Hospital to help them plan their pregnancies, and choose contraceptive methods that are well suited for them.

Our study evaluated the usefulness, efficacy and patient satisfaction of "MyContraception app". The study participants found the app easy to use, the information delivered about contraception methods relevant, their confidentiality and data security protected. They felt more prepared and comfortable during their family planning visit, and more confident to discuss about their needs and preferences with their healthcare providers, when choosing their best suited method.

This experience offered them a sense of empowerment by improving their health literacy in contraception and fertility which motivated a better observance and adherence to contraception. We had no loss to follow up in the intervention group compared to the control group. And no accidental pregnancies were reported.

Our study's strength is that of the novelty of the concept in Morocco, it sheds the light on the needs and challenges in Family Planning in Morocco, and offers a digital solution to motivate women achieve their reproductive goals. Our limitations are the limited number of participants, and the difficulty to generalize the results since our study concerned a specific culture and population which is Moroccan women visiting our maternity in Rabat. We intend to conduct in the near future, a multi-centric cohort study during a longer period of time, to evaluate the efficiency of our digital solution to prevent unwanted pregnancies and their consequences.

Conclusion:-

«MyContraception» is an android contraception mobile app, created with the aim to provide women with a comprehensive contraceptive counselling, that is centred around their needs. It was based on the WHO guidelines for contraception. Its purpose is to help overcome obstacles to the implementation of sexual and reproductive health programs in Morocco. Our results are promising, showing the willingness of Moroccan women to engage in new technologies and to become more autonomous in taking care of their health especially their sexual and reproductive health, which will empower them and help them improve all the other aspects of their lives.

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