

# A Mobile Health Application Co-Designed by Community Youth Leaders in Cameroon to Address Contraceptive Needs in a Conflict-Affected Region: A User-Centered Approach

Jacqueline Fonkwo, George Ashu Agbor-Ntoh\*, Michael Ebangha Besong, Ariane Nouko, Sinet Akih, Roosevelt Wacha and Justin Chee Ngong

Youth 2 Youth, Bamenda, Cameroon

## \*Corresponding Author

George Ashu Agbor-Ntoh, Youth 2 Youth, Bamenda, Cameroon.

Submitted: 2023, Oct 27 Accepted: 2023, Nov 22 Published: 2023, Nov 28

**Citation:** Fonkwo, J., Agbor-Ntoh, G. A., Besong, A. N., Akih, S., Wacha, R. S., et al. (2023). A Mobile Health Application Co-designed by Community Youth Leaders in Cameroon to Address Contraceptive Needs in a Conflict-Affected Region: A User-Centered Approach. *Biomed Sci Clin Res*, 2(4), 400-404.

## Abstract

### Introduction

Contraception is an effective tool to control births and prevent sexually transmitted diseases. In Cameroon, there is a wide gap regarding access to information and tools on contraception amongst youths. Moreover, in the Northwest Region of Cameroon, there is an ongoing socio-political crisis since 2017. In 2022, Cameroonians in the Northwest Region designed an innovative solution to improve access to contraception through an mhealth tool called NANG involving community youth leaders. This research explores the perspectives of community leaders on the current contraception problem and their participation in providing a solution.

### Method

A qualitative study was done. Of the 10 potential participants, 7 consenting community youth leaders were engaged through semi-structured interviews after 6 months of work on the app and 2 months following its deployment. All responses were recorded, transcribed, and analyzed. A thematic data analysis was done, and main themes highlighted.

### Results

According to the youth leaders, contraception is major problem in the Northwest Region of Cameroon due to related stigma, limited affordability, and availability for youths in the region. Digital tools were mentioned to be an important asset in solving the contraception problem. All leaders felt positive about participating in such a project.

### Conclusion

Digital tools like an mHealth app can contribute to meet contraceptive needs in a conflict-affected area, and a participatory approach with youths should be considered.

**Keywords:** MHealth, Contraception, Conflict, Community Youth Leaders, Cameroon

## List of Abbreviations

- SRH: Sexual and Reproductive Health
- WHO: World Health Organization

## 1. Introduction

Contraception is an effective means of controlling pregnancies and births [1]. Through diverse methods of contraception that exist, couples can decide when to have babies. Contraception in some cases can be a major tool to prevent the transmission of venereal diseases [1]. Sexually transmitted diseases and unwanted pregnancies are very common amongst youths compared to the general population [2]. Given this first level of vulnerability, it is expected that youths, irrespective of

their background have access to contraceptive methods and effectively use them. Based on estimates done in 2017, the World Health Organization (WHO) reported that 214 million women of reproductive age in developing regions of the world have unmet needs regarding contraception [3]. In Cameroon, WHO statistics in 2018 reported that 88.4% of youths aged 15-19 years old who were not in any formal union were not using any method of contraception; meanwhile, 10.5% of them used modern methods of contraception [4]. Generally, women of reproductive age have unmet contraceptive needs due to limited access to contraception, limited choice of methods, fear, or experience of side-effects, and cultural or religious opposition amongst others [3].

Since 2017, Cameroon is experiencing a socio-political crisis affecting the Northwest and Southwest Regions of the country. The protracted nature of this crisis has led to hundreds of thousands of internally displaced persons and has equally weakened the health system with the destruction of health facilities, the fleeing of health staff, and the disruption of health services generally [5]. This unrest has affected access to healthcare in the Northwest Region of the country and youths here must face a second level of vulnerability regarding their contraceptive needs being met and gaps in their sexual and reproductive health (SRH) as a whole. Several local and international organizations have sought to meet these needs through diverse means. One of these local organizations is Youth 2 Youth Cameroon, based in the Northwest Region of Cameroon. With the participation of youths from the region and other stakeholders, she developed an SRH mobile application called 'NANG' to meet SRH needs youths may be facing. This app was designed with three main components: 1) A health education section to raise awareness on contraception and other SRH issues, 2) A tele-health section which affords youths the possibility of meeting doctors virtually for consultations, and 3) A geo-localization section that provides a GPS location of health facilities in the region. While designing and implementing this mobile app in the region, the organization involved 10 community youth leaders from the region as main stakeholders. This engagement was done through discussions, workshops, and field sensitizations that the community youth leaders were required to do in the Northwest Region. After fully participating in the design of the app and working with youths in the region to download and use the app, we undertook exploratory research on the participation of community youth leaders in addressing contraceptive needs using digital methods in a context of fragility. This research generally sought to assess the perspectives of community youth leaders on contraception in the region and their participation in co-designing the NANG app. Specifically, we sought through community youth leaders to understand the contraception problem in the Northwest Region of Cameroon, to know how relevant a digital solution like NANG is in addressing contraceptive needs within this context, and to evaluate their perspective after being involved in co-designing and implementing the NANG mobile app.

## 2. Methods

### 2.1 Study Design and Procedure

Prior to this study, community youth leaders were recruited by Youth 2 Youth Cameroon to participate in the design and implementation of the NANG mobile health application. This was done through several meetings, workshops, and continuous communications on social media platforms which the Youth 2 Youth Cameroon team shared with the community youth leaders. These youths were engaged to know the issues youths like them in the Northwest Region of Cameroon faced regarding their sexual and reproductive health. They were further engaged to suggest the content and style that the mobile app will have. Moreover, youth leaders did several field sensitizations in their various communities so that fellow youths could download and use the mobile app. This research was carried out 6 months after these youths had been recruited and 2 months after the app had been deployed in the field. To answer our research questions, we conducted a qualitative study with semi-structured interviews. We included in our study all consenting community youth

leaders who had worked with Youth 2 Youth Cameroon during the design and/or the implementation phase of the NANG mobile app. All youth leaders resided in the Northwest Region of Cameroon throughout this study.

### 3. Sampling and Data Collection

Information regarding this study was shared to all community youth leaders within a WhatsApp group. This was done by an investigator from Youth 2 Youth Cameroon who had not previously worked with the community youth leaders. This ensured that response bias was limited as the investigator was somewhat an 'external' researcher. Participation in the study was encouraged but remained optional. Community youth leaders who were interested in participating in the research had to contact the investigator who in turn arranged for a call with them during which the interview was conducted. All interviews were done through phone calls from October to November 2022. Although face-to-face interviews would have been ideal, phone calls proved to be more convenient as participants lived in different areas of the Northwest Region of Cameroon which was insecure during the entire study period. Participants were further informed of the study and a verbal consent was sought. Once this was granted, each interview was done and recorded by the investigator. Participant were interviewed about the main issues of contraception in the region, the effect of the crisis on contraception, suggested solutions and their involvement in the project. Recordings were transcribed and stored in 2 separate and passworded laptop computers accessible by the research team.

### 4. Data Analysis

A thematic analysis of the transcribed data was done. Based on available data, specific themes were developed to reflect the objectives of the research. Two independent researchers were involved in selecting the themes. Five major themes were selected and responses that reflected each theme were grouped together and reported.

### 5. Ethical Considerations

Ethical clearance was obtained in Cameroon from the National Ethics Committee for Human Health Research. This study was done as part of the research on the NANG mobile health app. Participants had to provide an informed verbal consent for this research. Furthermore, participants were free to stop responding if they felt like doing so. Respondents' anonymity was respected as their recording and transcripts were encoded.

### 6. Results

Altogether, seven community youth leaders participated in this study. Five participants were female (71.4%) meanwhile two were male (28.6%). The ages of participants ranged from 16 to 30 years old. The following results reflect the findings that was obtained after interviews were conducted.

### 7. The Contraception Problem

According to most community youth leaders, contraception is currently a major issue in the Northwest region of Cameroon. This, some said, was reflected by the alarming rate of unwanted pregnancies amongst youths in the region. Some respondents linked the contraception problem to limited affordability from

youths in the region. One of the participants said: *“Contraception is a problem right now, not because youths are not able to take it but because it is not affordable considering the crisis right now the prices are way too high for people to afford.”* Another participant argued: *“...I would say right now it is a problem because the means to have it is not that easy. To have it you will need to go... to hospitals before you have it. So, people find it like difficult to do that... especially youths.”* Furthermore, participants in this study indicated that the contraception problem currently faced by youths is related to being stigmatized as users of contraceptives. One of the respondents said *“This aspect of stigma, like you are afraid to buy it... When you go to buy it, they are asking questions like ‘Who are you going to give to?’; ‘Are you the one to use it?’ And ‘What age are you?’ ... ‘How old are you?’ And they are like making a mockery of you. So, I think this aspect of stigma is a very big problem... Making contraception very difficult for youth...”* Although most community youth leaders felt that contraception was a problem, one of the study participants had a different view. They felt contraception may not be a big problem amongst youths in the region, saying: *“With the use of these mobile phones... the android phone, they are able to browse, you know there are fast in learning, they are able to browse and know a lot of things, and when they don't know, they ask, they google, and google gets to tell them what they are supposed to know and get it themselves, even without...”*

## 8. The Effect of the Socio-Political Crisis on Contraception in the Region

According to all participants, the ongoing crisis in the Northwest Region of Cameroon has played a role in limiting access to contraception by youths. According to some, given that the crisis has impeded on formal classes and the schooling of youths, they may not be able to be educated on sexual and reproductive health issues, hence limiting their knowledge and use of contraception. One of the participants mentioned that *“I just feel because maybe due to the crisis our youths are not going to school, because they do basic sex education in schools. Most of them are not even going to school to get the basic knowledge. Some of them are idle and because of idleness they turn out to engage in certain activities.”* According to another participant the crisis has affected the health system by causing closure of health facilities where contraceptive tools could be obtained hence making access to contraception a problem: *“I will say the crisis has really affected it (contraception)... So much... With the advent of the crisis, there are so many health centers, there are so many pharmacies that have been shut down ... Maybe due to gun shots...”* Another participant added: *“Yeah, I can say the crisis has also had an effect on it because... There are some areas where there were hospitals there, and people around there would like to visit the hospitals to get the contraceptives... But now that the hospitals have shut down due to the crisis, it becomes a big problem to those living around there, because they don't have the means to have it there.”*

## 9. A Digital Solution

Participants shared their thoughts on how helpful a mobile application can be to bridge some gaps relative to the contraception problem in the Northwest Region of Cameroon. All but one participant indicated that a digital solution would help bridge the problems youths in the region face regarding

contraception; she said: *“Definitely! An app will be a solution... yeah, because just like I had mentioned, youths face a lot of stigmatizations getting to medical facilities and to pharmacies. But with an app, you can easily put your credit without being stigmatized or being controlled by anyone, download, activate your data or so, get into the app and ask your questions”*. On the other hand, one of the participants thought that having a mobile app tailored to youths' sexual and reproductive needs may not be a total solution in itself. The participant said: *“...No because after getting knowledge how will we get it. That is the question. How will we get it to be able use it?”*

## 10. Impressions about Co-Designing and Implementing the NANG Mobile Application

All community youth leaders that were interviewed unanimously expressed their satisfaction and happiness to be part of those that co-designed the NANG mobile app. They were involved in 2 main phases, during the design phase (sharing ideas on how the NANG app should look like) and during the implementation phase (mobilizing fellow youths to download and use the NANG app). Participants used terms like *‘excited’*, *‘grateful’* and *‘privilege’* to describe how they felt having participated on this project. One of the participants said, *“I was really excited. I was really like it was a great opportunity to me it was more of a privilege to be part of it. Yes, I learnt a lot. Personally, I learnt a lot... Certain things I didn't even know about my own self.”*

Apart from the fact that these youths considered their involvement as a great opportunity, some confessed that the outcome of their participation helped them as individuals and would have lasting effects in the community. Their comment are as follows: *“It has been very helpful to me because I have learnt a lot... First thing, I have been able to improve my social life...”*; *“I have learnt a lot especially when it comes to my sexual and reproductive health”*; and *“Of course, I can boast that I have played a very important role for the implementation of this app... I really know I did a great role, and I can boast of that, and I am proud, and I know that this will go a long way to resolve youths' problems”*.

## 11. Working with Youths on Youth-Related Projects

All participants indicated that it was important to have youths on board as decision makers on a mobile app that concerns them. They were engaged to determine the content of the NANG app and had these testimonies: *“Generally, I feel the whole idea of involving youths was just perfect, because the app was just... The app was for the youths. The whole process would not have just gone through without the youths, without us... without the youth... Normally we are the mouthpiece of others. We are the ones experiencing, we are the ones in the field handling the experience.”* According to another participant, youths should be key decision makers and should not have things imposed on them; they said *“I'm one person who believes in youths' inclusion in local governance or if not, youths' involvement in their day-to-day activities and in things that they will participate in. It's good that youths should make decisions about what they want to take place tomorrow in their lives, rather than other people sitting and making... Imposing things on youths... This is a very good initiative.”*

## 12. Discussion

In this study, we found that there exist some barriers to the effective use of contraception by youths in the Northwest Region of Cameroon as reported by community youth leaders of the region. The Northwest Region of Cameroon has been the seat of a socio-political crisis since 2017. Some factors affecting the use of contraception by youths are directly or indirectly linked to this crisis, meanwhile others are not. Stigma was cited more than once as a barrier to access contraception in this study. Stigma is not a crisis-related factor, and it remains a common issue amongst African youths resulting in a sub-optimal use of contraception. In a qualitative study conducted in urban Conakry amongst adolescents and youths in 2019, the authors mentioned that socio-cultural factors played a role in preventing contraception use [6]. In this study which involved 56 in-depth interviews and 10 focus group discussions, the author reports that the use of contraception and the users are not well seen in most ethnic groups. We found similar perceptions of societal influence on the use of contraception in this context. In most communities of sub-Saharan Africa, society plays a role in determining peoples access and uptake of healthcare. Chukwunke et al. in their article on Culture and Biomedical care in Africa describe how societal cultures are determinant in people's access to healthcare services [7].

On the other hand, in this study, it was mentioned that some barriers to contraception were exacerbated by the ongoing crisis, notably the disruption in health facilities that provide contraceptives. The socio-political unrest has weakened the health system, specifically affecting service delivery and availability of medication and other pharmaceutical products or technologies. This has had a negative impact on the ability of youths in the region to access contraceptives, hence limiting their use of it. Given that health facilities which were within reach have been affected by the crisis, it may be difficult for youths to travel longer in search of contraceptives. Furthermore, health facilities are informative to the public, and their absence may entail that youths have fewer sources of health-related information. As it was mentioned, schools that also provide a platform of education on sexual and reproductive health have been affected by the crisis. This may indeed have an indirect effect on youths accessing contraceptives. Moreover, the ongoing crisis has disrupted several businesses and socio-economic activities, affecting the purchasing power of individuals and youths in the region, hence the complaints about affordability of contraception. Also, destruction of stores and other outlets for contraception may have made these products fewer and more expensive.

Cost, limited health facilities, limited access to education on sexual and reproductive health, and stigma were mentioned as factors affecting contraception use in the Northwest. An online solution seems to be appropriate in addressing these issues. The NANG mobile app has three main sections; the first provides a platform for sensitization on sexual and reproductive health issues, the second provides a tele-consultation platform, meanwhile the third allows users to have access to the geolocation of health facilities in the region. As one of the participants mentioned, the app may be thought to be redundant as youths are fast and up to date; using their phones and the internet they may

be able to have access to services like those proposed in the app. However, in low-resource settings or conflict affected regions, there may be disruption of normal communication services and full access to healthcare. A mobile health application like this one can be helpful in similar contexts, supporting the health system. It will be advantageous in providing access to human resource for health, access to health education, and localizing available health facilities. Notwithstanding, an online solution may be limited to being informative but would not be able to provide actual contraceptives.

In this study, all community youth leaders were unanimous about how happy they were to be involved in the project and they equally mentioned how beneficial this association was to them. The NANG mobile health app was conceived by a youth, designed by fellow youths, and made to be used by used. It certainly made a difference to these youths who felt actively involved in the design and the implementation of the app. It is important that mobile services used by youths are not just tested on the youths prior to deployment but involving those to whom the application is destined for from the design phase could make a difference. In the case of NANG, youth leaders were involved fully and actively. They were satisfied and enthusiastic at all phases. This enthusiasm would in turn make them influence fellow youths to improve uptake of the app amongst their peers. This approach can be replicated in other health and non-health apps to ensure that there is representativity amongst consumers of the services.

One of the limitations of our study was the sample size. A sample of seven was small to provide highly accurate results. Although these were youth leaders who represented a larger community, it would be more accurate to have a similar study carried out with more youths in the community. Also, we were constrained by the current unrest in the Northwest Region preventing us from having face-to-face interviews and widening to study to involve the wider youth community and other key informants [8-13].

## 13. Conclusion

The ongoing humanitarian crisis in the Northwest Region of Cameroon has brought a huge strain to the health system affecting the uptake and use of contraception by youths in the region. According to community youth leaders in the region, existing barriers to contraception use have been exacerbated by the crisis. Wide use of the NANG mobile app could contribute to improving contraception use. Youths are particularly excited when they feel involved as decision makers in mobile app projects that involve them, and they would like to this see more often.

## 14. Declarations

- **Ethics approval and consent to participate:** Ethical clearance was obtained in Cameroon from the National Ethics Committee for Human Health Research. All participants in this study had to provide an informed consent for this research.
- **Consent for publication:** Not applicable.
- **Availability of data and materials:** The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.



- **Competing interests:** The authors declare that they have no competing interests.
- **Funding:** No funding was received for this research.
- **Authors' contributions:** NF, MEB, AN, and JCN conceived and developed the research idea. MEB and AN performed interviews during the focus group discussions. GAA did the transcription, data analysis, and prepared the manuscript. SA and RWW gathered participants for data collection; they equally ensured data storage. JNF, MEB, GAA, and AN proofread the manuscript. All authors read and approved the final manuscript.
- **Acknowledgements:** We would like to thank all community youth leaders in Bamenda who participated in the interviews. We equally thank the following institutes for supporting the NANG mobile app creation project: Gates Institute, Hempel Foundation (through the UNLEASH Plus program), and Grand Challenges Canada.

## References

1. CDC, A. W. (2020). Centers for disease control and prevention.
2. Mason-Jones, A. J., Sinclair, D., Mathews, C., Kagee, A., Hillman, A., & Lombard, C. (2016). School-based interventions for preventing HIV, sexually transmitted infections, and pregnancy in adolescents. *Cochrane Database of Systematic Reviews*, (11).
3. Waites, G. M. (2003). Development of methods of male contraception: impact of the World Health Organization Task Force. *Fertility and sterility*, 80(1), 1-15.
4. World Health Organization. (2020). Contraception within the context of adolescents' sexual and reproductive lives: country profile: Togo (No. WHO/SRH/20.43). World Health Organization.
5. Cunliffe, A. (1995). The refugee crises: A study of the United Nations High Commission for Refugees. *Political Studies*, 43(2), 278-290.
6. Dioubaté, N., Manet, H., Bangoura, C., Sidibé, S., Kouyaté, M., Kolie, D., ... & Delamou, A. (2021). Barriers to contraceptive use among urban adolescents and youth in Conakry, in 2019, Guinea. *Frontiers in Global Women's Health*, 2, 655929.
7. Chukwunneke, F. N., Ezeonu, C. T., Onyire, B. N., & Ezeonu, P. O. (2012). Culture and biomedical care in Africa: the influence of culture on biomedical care in a traditional African society, Nigeria, West Africa. *Nigerian Journal of Medicine*, 21(3), 331-333.
8. Casey, S. E., Isa, G. P., Isumbisho Mazambi, E., Giuffrida, M. M., Jayne Kulkarni, M., & Perera, S. M. (2022). Community perceptions of the impact of war on unintended pregnancy and induced abortion in Protection of Civilian sites in Juba, South Sudan. *Global public health*, 17(9), 2176-2189.
9. Chandra-Mouli, V., McCarraher, D. R., Phillips, S. J., Williamson, N. E., & Hainsworth, G. (2014). Contraception for adolescents in low and middle income countries: needs, barriers, and access. *Reproductive health*, 11, 1-8.
10. Singh, A., Singh, K. K., & Verma, P. (2016). Knowledge, attitude and practice GAP in family planning usage: an analysis of selected cities of Uttar Pradesh. *Contraception and reproductive medicine*, 1(1), 1-10.
11. Edietah, E. E., Njotang, P. N., Ajong, A. B., Essi, M. J., Yakum, M. N., & Mbu, E. R. (2018). Contraceptive use and determinants of unmet need for family planning; a cross sectional survey in the North West Region, Cameroon. *BMC women's health*, 18, 1-8.
12. Bacchus, L. J., Reiss, K., Church, K., Colombini, M., Pearson, E., Naved, R., ... & Free, C. (2019). Using digital technology for sexual and reproductive health: are programs adequately considering risk?. *Global Health: Science and Practice*, 7(4), 507-514.
13. Otu, A., Ukpeh, I., Okuzu, O., & Yaya, S. (2021). Leveraging mobile health applications to improve sexual and reproductive health services in Nigeria: implications for practice and policy. *Reproductive Health*, 18, 1-5.

**Copyright:** ©2023 George Ashu Agbor-Ntoh, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.