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## Perceived Benefits and Disadvantages Associated with the Use of the Electronic Consultation Register by Health Providers in the Health District of Toma, Burkina Faso

Issaka Saouadogo, MSc<sup>1</sup>, Douglas Mbang Massom, MPH<sup>2</sup>, Soutongnoma Safiata Kabore, MSc<sup>3</sup>, Ronny Kevin Fomete Djatsa, MSc<sup>4</sup>, Josiane Seu, MSc<sup>5</sup>, Patrice Ngangue, MD, MSc, PhD<sup>5</sup>

<sup>1</sup>Institute for Interdisciplinary Research Training in Health Sciences and Education, Ouagadougou, Burkina Faso, <sup>2</sup>Epidemiology, Intervention and Training Department, Epicentre, Yaounde, Cameroon, <sup>3</sup>Institute for Interdisciplinary Research Training in Health Sciences and Education, Ouagadougou, Burkina Faso, <sup>4</sup>Laboratory for Research on Economic and Social Transformations, Research Laboratory on Economic and Social Transformations, Cheikh Anta Diop University of Dakar, Senegal, <sup>5</sup>Faculty of Nursing, Laval University, Quebec, Canada.



**\*Corresponding author:**

Patrice Ngangue, MD, MSc, PhD,  
Faculty of Nursing Sciences,  
Laval University, Laval, Québec,  
Canada.  
Tel: +14182614696

patrice-alain-gerard.ngangue.1@ulaval.ca

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### ABSTRACT

**Background and Objective:** Most countries in sub-Saharan Africa need to catch up in integrating information and communication technologies (ICT) into their health systems. This is mainly because of the need for more infrastructure that allows for reasonable use of the technologies. To support the actions of the Ministry of Health of Burkina Faso, a Non-governmental Organization (NGO) has implemented the integrated electronic diagnostic approach (IeDA) Project. The project includes the deployment of an electronic consultation register (ECR). This article aims to explore the perceptions of healthcare providers on the benefits and disadvantages of using the ECR.

**Methods:** We conducted a qualitative, descriptive study through individual semi-structured interviews with healthcare providers. Data were collected in the Toma health district in December 2021. In addition, a thematic analysis was performed using NVivo software.

**Results:** Thirty-five healthcare workers were interviewed (19 nurses, 7 midwives, 6 mobile community health and hygiene workers, and 3 birth attendants). Two main themes emerged from our analyses, which are the advantages and disadvantages perceived by ECR users. Our data suggest that using the ECR had many benefits ranging from improving healthcare providers' knowledge and performance in terms of patients' care, assisting and helping in patient diagnosis and treatment and improving patient satisfaction. However, the participants also shared their negative perceptions about the ECR, mentioning that it increased their workload. They also reported lengthened consultation time and work duplication as the tool was still in its trial phase and was used along with the paper consultation register.

**Conclusion and Global Health Implications:** The ECR is an effective tool for diagnosis and management, which has several advantages and reasonably satisfies patients. However, disadvantages, including increased workload and lack of fluidity and stability of the system, must be considered to ensure better usability.

**Keywords:** Benefits, Disadvantages, Electronic Consultation Register, Health Providers, Burkina Faso

### INTRODUCTION

The use of information and communication technologies (ICTs) has considerably revolutionized the life of humanity.<sup>[1,2]</sup> ICTs are a significant factor in the development and growth of several sectors in developed and developing countries.<sup>[3]</sup> Most countries in sub-Saharan Africa need more

ICT infrastructure, which allows for reasonable use of the technologies.<sup>[2]</sup> Conversely, some countries such as Rwanda, Ethiopia, and South Africa show significant progress. These countries have established solid institutional anchoring to ensure solutions' interoperability and establish a data center to coordinate and exploit telemedicine.<sup>[2,4]</sup> In general, ICTs occupy an important place in several sectors of life where they contribute intrinsically to improve living conditions.<sup>[5]</sup> For example, they are increasingly involved in the health field, with a considerable contribution in facilitating access to care at all levels, providing patient-centered and lower-cost care, increasing the efficiency of clinical decision-making, and better managing chronic diseases.<sup>[6-8]</sup> One innovation that effectively improves health systems is using an electronic consultation register (ECR).<sup>[9,10]</sup> Often associated with the electronic medical record (EMR), it has been defined by the World Health Organization as a tool used to capture, store, and share information among healthcare providers and patients.<sup>[11,12]</sup>

To support the Ministry of Health (MoH) of Burkina Faso, the non-governmental organization (NGO) *Terre des Hommes* (TDH), through a partnership agreement and a consortium of partners, has implemented the integrated electronic diagnostic approach (IeDA) Project. This project was implemented in 2014 and aimed to reduce morbidity and mortality in children under five by digitalizing the integrated management of childhood illness (IMCI) protocol.<sup>[13]</sup> In part of this project, TDH and the MoH have developed applications that include an ECR for maternity. This ECR is a decision support tool for maternal and neonatal care that consists of an application for collecting data during consultations of children over five years of age and stock management for the health facility drug depot. The application was deployed in the Toma district starting in 2019. Independent evaluations of the IeDA tool have concluded positive results regarding impact, population acceptance, and financial gains for the health system.<sup>[14]</sup> However, these results are closely linked with healthcare providers' proper use of tool. In addition, these evaluations did not consider the perceptions of ECR users.<sup>[13]</sup> Therefore, this study explores healthcare providers' perceptions regarding using the ECR in their daily activities.

## METHODS

### *Theoretical Framework*

Several theoretical models have been used to analyze users' perceptions and acceptance of technologies, including the technology acceptance model (TAM) by Davis *et al.*<sup>[15]</sup> It is a behavioral model of end-user acceptance of new technologies that serve as a basic conceptual framework for those designing and deploying new technologies. It posits that a

technology's perceived usefulness and ease of use predict its intention to use it, which correlates to its actual use. The TAM and its subsequent iterations were designed and deployed to assess technologies in the developed world, particularly among workplace computer users. This new conceptual framework for technology acceptance is the basis for this study. It represents one of the most recent theories developed to understand the use of ICT and will allow us to understand better the effects of using an ECR.

### *Study Design and Recruitment*

A qualitative, descriptive, and exploratory approach was adopted for this study through individual semi-structured interviews conducted with healthcare providers in the Toma health district. We explored health providers' perceptions of ECR use and the benefits and disadvantages associated with their use during patient care. An exhaustive sampling of all health facilities was conducted, and one health worker was randomly selected per facility.

Participants working in a health facility within the Toma district during the study period who have been involved in consultation and patient management activities and who have received training in the use of the ECR were included in this study. We also ensured they gave free and informed consent to participate in the study without coercion.

### *Data Collection*

Data were collected using an interview guide based on a literature review and our theoretical framework. Semi-structured questions were developed and later transcribed on the Kobo toolbox software. The interview guide was pre-tested in a health district with the same characteristics as the Toma health district. Semi-structured interviews were conducted at a time convenient to the participant between December 01 and 30, 2021. Information collected was related to participants' gender, age, qualification, education level, number of years in the current job, number of years in the health center, function in the health center, number of years, and training in the use of the ECR. Finally, questions concerning the effects of using the ECR were also asked. All interviews were conducted under the principal investigator's supervision and recorded after written consent was obtained from the participants using an audio recording device and note-taking.

### *Data Analysis*

Thematic analysis of the qualitative data was conducted in six steps according to the Braun and Clark approach.<sup>[16]</sup> First, the transcribed data from all interviews were read several times

to identify initial ideas before being compared to the data generated by the literature review. Using the NVivo software, the data were classified into father nodes and subnodes based on the themes that emerged during the data collection. We then synthesized the data to make comparisons. Thus, the emerging similarities and differences were discussed and compared to the scientific literature to retain only the convincing codes. After obtaining complete and satisfactory thematic representations, each theme was finally renamed and maintained for the study. Finally, relevant quotes from the collected data were used to illustrate the interpretations and findings during the discussion.

Transferability was achieved by the exhaustive sampling of all health facilities and by a random and reasoned selection of one health worker per health facility. All respondents were trained in the use of the electronic consultation tool. In addition, our interviews were conducted with health workers who met the selection criteria for our study.

Throughout this study, we followed the standards for reporting qualitative research.

## RESULTS

### *Sociodemographic Characteristics*

Thirty-five healthcare workers were interviewed (19 nurses, 7 midwives, 6 mobile community health and hygiene workers, and 3 birth attendants). No participant withdrew from the study during the interview [Table 1].

Two main themes emerged from our analyses: positive and adverse effects perceived by ECR users.

### *Benefits of Using the ECR*

The ECR is a tool that assists in diagnosing and managing sick children. Therefore, it can be a tool that strengthens organizational and human skills but also improves health workers' knowledge. Our results show a good perception of the ECR regarding reinforcing skills. This is illustrated by some participants' comments as follows:

*"It has many benefits; there is the strengthening of my skills, the closer connection with the patients, and the change of vision of certain things"* (Participant 12).

The ECR requires rigor regarding the care process by compelling the health provider to follow the different sequences of patient evaluation. All of these will lead to a good diagnosis and better treatment. Therefore, the ECR is perceived as a tool that improves the performance of healthcare providers in terms of care. This is illustrated by the words of several participants as follows:

**Table 1:** Socio-demographic characteristics of participants.

Socio-demographic characteristics	n	Percentage
Age (years)		
<24 years	0	0
25–35	23	66
35–45	12	34
>45	0	0
Gender		
Male	23	66
Female	12	34
Occupation		
Nurse	19	54
Midwife	7	20
Mobile health agent	6	17
Birth attendant	3	9
Physician	0	0
Others	0	0
Professional experience (years)		
<1	8	23
1–5	20	57
>5	7	20
Experience using the ECR (years)		
<1	9	26
1–5	23	66
>5	3	9
Level of education		
Secondary	18	52
University	17	48
ECR: Electronic Consultation Register, n: number of participants.		

*"It facilitates our service by following the ECR; we respect all the steps, it improves our service, and it has many advantages"* (Participant 13).

Secondly, the comments of our participants show reasonable patient satisfaction. In our study, healthcare providers mentioned the patients' satisfaction regarding the quality they felt. For example, one participant said, *"It makes it easier to work with our patients. There is trust, and the person confides freely"* (Participant 15).

### *Disadvantages of Using the ECR*

Primarily, we can mention dissatisfaction with the ECR tool and the workload. The providers thought implementing the ECR would help them produce their statistical reports, which are different from its current version. On the other hand, some healthcare providers considered that the ECR

was losing their consultation data. One participant stated, “We have data mismatches between digital and paper that do not encourage often enough, especially if the work is seen at a discount” (**Participant 19**). Others think it is because the applications are too heavy that it crashes. According to them, the recurring bug could be linked to the low capacity of the Random Access Memory (RAM) of the tablets: “On my part, I think the applications are heavy, and we must think of simplifying so that the ECR becomes faster for the happiness of the providers and the patients” (**Participant 10**).

The other element related to the adverse effects perceived by the users is the workload. Participants were unanimous in stating that the ECR increased their workload. This was confirmed by a participant who said, “With the ECR, the workload is very high. If you could handle two women, with the ECR, you could only handle one woman” (**Participant 13**).

Secondly, before the ECR, workers used paper supports for assessment and intake. With these materials, they could easily skip specific steps in the assessment and intake process, especially the recommended counseling part. With the ECR, these agents are obliged to follow all these steps. This leads some agents to believe that the ECR lengthens consultation time, as some participants stated: “With the ECR, consultation time had become longer than when there was no ECR” (**Participant 25**). In addition, participants reported the duplication of work during consultations. For them, using the ECR and paper-based materials makes the work tedious. One participant mentioned: “Yes, there is a change in workload because the workload has increased. However, it would be best if you took the time to record it in the registry and the ECR whether it is for Integrated Management of Childhood Illness (IMCI) or Electronic Medical Record (EMR)” (**Participant 33**).

## DISCUSSION

Our study aimed to identify the benefits and disadvantages of using the ECR by healthcare providers in the Toma health district in Burkina Faso. This study allowed us to highlight the aspects that could contribute to the success of using this tool. The results showed that the ECR allows a good diagnosis and management of patients, reflected in the strengthening of skills, the satisfaction of the children’s caregivers and the rational prescription of drugs noted in various participants. However, dissatisfaction with using the ECR tool and increased workload were reported by some participants. Most of them had a positive perception of the use of mobile technology in healthcare. Indeed, our results generally showed that the ECR enables good diagnosis and management of patients. This corroborates with the results obtained in other settings where healthcare professionals report a positive experience using

portable electronic devices or Personal Digital Assistants (PDA).<sup>[17]</sup> Furthermore, participants said that the benefits of using the ECR also extend to health promotion. For example, it incorporates infant and young children feeding advice and preventive measures for COVID- 19. This advice is supported by visual aids that allow patients and their caregivers to assimilate the message better. The same finding was reported by Cherrez-Ojeda *et al.*, who added that most physicians agree that ICT can help promote health services and medical procedures.<sup>[18]</sup> As e-health applications grow, they will allow for more personalized patient care, guiding them when choosing a healthcare professional.<sup>[19]</sup>

Concerning the ease that the ECR offers for good practice of healthcare delivery and better adherence to guidelines stated by our respondents, a study conducted a few years ago reported that health providers believe that mobile health will improve patient follow-up, thereby helping them to identify pregnant women who have missed antenatal consultation visits. They also emphasized the role of computers and the electronic health record in automatically generating appointment reminders and improving patient follow-up.<sup>[20]</sup> Furthermore, in their study conducted in Burkina Faso, Bessat *et al.* emphasized that most ECR users increased their knowledge by using this tool, which made them learn new things.<sup>[21]</sup> They also noted the benefits of the ECR in managing children, facilitating decision making and rational use of drugs.<sup>[21]</sup> This last point corroborates our participants’ responses on strengthening their skills and prescribing medications.

Furthermore, the tool contributes to patient safety through optimal drug use and could reduce antibiotic resistance. Therefore, we can confirm that the ECR is a tool that assists in diagnosing and managing patients. However, it needs to be clarified whether its effectiveness can be extended to managing several different pathologies.

Finally, the ECR improves the relationship between the caregiver and the patient. As mentioned above, there is reasonable patient satisfaction, which is corroborated by the results of a previous study in Burkina Faso. This states that a village chief referred to the tool as a “magic tablet” because during the consultation, children were touched by the nurses more often than before and that the ECR brought light to subjects that were in oblivion.<sup>[21]</sup>

This overall positive perception of the effects of the ECR should give decision-makers more confidence to move toward the complete digitalization of first-line care protocols. However, this must be preceded by one or more descriptions of the effects of this digitalization, which may be harmful depending on the economic, cultural, and health contexts.<sup>[22]</sup>

The adverse effects perceived by the agents were dissatisfaction with the ECR tool and the workload increase. We did not find

enough literature to corroborate or refute these statements by users. This may be because the practice is much more recent and limited to a few countries in Africa and Asia. The study results by Bessat *et al.* confirm what we said about the workload mentioned by users.<sup>[21]</sup> Indeed, some healthcare providers might be tempted to turn away patients because they feel they have much to do with the ECR. As this tool is only used in some health facilities in the country, some patients may choose to change health facilities for consultations. This may lead to fewer consultations in the health and social promotion centers that use an ECR.<sup>[22]</sup> In addition, to limit waiting time, some patients may prefer to avoid going there and practice self-medication, which is becoming more and more of a public health problem.<sup>[23]</sup>

### ***Strengths and Limitations of the Study***

This study is focused on health providers in the Health and Social Promotion Center (HSPCs) of the Toma health district. Therefore, it does not consider the opinions and effects perceived by users of health services, who may have a different view. Furthermore, our study was conducted when the content of specific applications such as the maternity ECR, stock management, and the EMR is being improved, which could influence the perception of agents on the quality of the ECR tool and the ease of use of the applications. We also noted that specific reference values were not considered verbatim, which could help to define the problem better. Finally, the insecurity in certain localities disrupts health providers' peace of mind but only facilitates our travel to these localities. Another qualitative study, including hospital doctors and computer specialists, could provide much more information to improve the IeDA approach.

## **CONCLUSION AND GLOBAL HEALTH IMPLICATIONS**

This qualitative study highlighted the positive and adverse effects of using the ECR. ECR is an effective tool for diagnosis and management, which has several advantages and reasonably satisfies patients. However, adverse effects, including increased workload and lack of fluidity and stability of the system, must be considered to ensure better usability.

### ***Key Messages***

- The Electronic Consultation Register allows a good diagnosis and management of patients.
- The Electronic Consultation Register improves the performance and skills of healthcare providers in terms of care.

- Workload increase and lack of fluidity and stability of the system must be considered to ensure better usability of the Electronic Consultation Register.

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## **COMPLIANCE WITH ETHICAL STANDARDS**

### **Conflicts of Interest**

There are no conflicts of interest.

### **Financial Disclosure**

Nothing to declare.

### **Funding/Support**

There was no funding for this study.

### **Ethics Approval**

Administrative authorization was obtained from the local health authorities for this study after a favorable opinion from the Burkina Faso Health Research Ethics Committee. The objectives, the voluntary nature, the importance of participation in the research and the possibility of withdrawal were explained before each interview. The confidentiality of the information collected was ensured by limiting access to the data only by the investigators and to the needs of the survey. To guarantee anonymity, each respondent was assigned a unique identification code to conceal their identity. This coding is constructed by taking into account the gender and seniority of participants. The results are presented so that participants cannot be identified. We followed the COREQ guidelines for writing and reading qualitative research reports throughout this study.

### **Declaration of Patient Consent**

Patient's consent not required as patients identity is not disclosed or compromised.

### **Use of Artificial Intelligence (AI)-Assisted Technology for Manuscript Preparation**

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

**Disclaimer**

None.

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