

Research Article

Communication Medium Used by Clients and Health Professionals in Accessing and Providing Healthcare in Low Resource Setting: A Descriptive Cross-Sectional Study

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Background. There exist continuing challenges with communication medium used during health service provision. These challenges relate to clients and health institution, intra- and interhealth institution communications. This study reviewed the existing healthcare communication medium from the perspectives of clients and health professionals at a tertiary hospital in Ghana. **Methods.** Cross-sectional design was employed with a multilevel sampling method to select a total of 650 participants consisting of 303 clients, 303 health workers, and 44 hospital directorate managers for the study. A structured survey questionnaire was used to collect data from respondents. **Results.** Close to ninety percent (89.8%) of staff resort to direct means (face-to-face medium) to communicate among each other. Majority (64.4%) of them also communicated with management through meetings sections. Nearly all healthcare providers (97.4%) communicated with clients through direct means (face-to-face medium). Almost all forms of communication between the hospital management members and the general public were done through letters and official memos. **Conclusions.** The study revealed blended forms of communication media used by health providers and health service consumers. These differences in medium of communication could amount to possible difficulties such as lack of information and truncation of information flow. Developing a systematic way of information flow using a common information platform will improve access to health services.

1. Introduction

Client-centered healthcare delivery that demonstrates effectiveness remains a major contributor to the achievement of the “health for all” concept [1]. In this regard, clients and

their relatives along with health providers remain pivotal to the overall health decision-making process. These parties normally engage in an exchange of information through communication about how to provide care and the availability of service. Communication is therefore seen as a very

important component in the decision-making process for both clients and care providers.

Ratna defined communication as imparting or exchanging information by speaking, writing, or using some other communication medium [2]. Communication mediums are the methods or tools which allow exchange and facilitation of information [3].

Previously, traditional mediums such as letters, telephone calls, and face-to-face discussions were used by managers of healthcare providers. In recent times, these have been supplemented by modern mediums such as email, web sites, video conferencing, and instant messaging through messaging apps such as WhatsApp and telehealth [3].

With the variety of methods or medium available for communication, it is important that managers choose the right method or medium for exchanging information. As indicated by Lengel and Draft if the medium of communication is not properly selected, the intended target or decision could be mixed [4].

The use of traditional telephone calls as medium for sharing healthcare information remains effective [5, 6]. This medium has seen a quick advancement in the development of communication in the Ghanaian healthcare delivery system despite reports on its setbacks [7]. In most developed world, other modern media such as telehealth have been tested and proven to be effective in the health system [8].

Bush et al. defined telehealth as the delivery and facilitation of health and health-related services including medical care, provider and patient education, health information services, and self-care via telecommunications and digital communication technologies. Live video conferencing, mobile health apps (mHealth), “store and forward” electronic transmission, and remote patient monitoring (RPM) are examples of technologies used in telehealth [9]. Chen in a World Health Organization report recommends the adaptation and use of effective mediums for patients-provider communication such as mHealth due to its prospects in transforming the face of health service delivery across the globe [10].

Despite the importance and recommendations of mHealth for communications by major health players like the WHO, there are still some identified bottlenecks such as low technological knowhow and illiteracy in its implementation in Ghana [11, 12]. Preliminary findings in a study conducted at the study site point to challenges including problems in identifying the nearest hospital, type of services available, availability of physicians and beds at the receiving hospitals as well as lack of reminder systems for providers and clients accessing tertiary facilities [13]. Komfo Anokye Teaching Hospital is one of the major healthcare delivery centers in Ghana. The hospital currently does not have a functional hospital-client-driven communication medium which allows effective clients-staff interactions for efficient service delivery [13]. Evidence-based information on the communication mediums used by staffs and users of the facility is required for planning and policy-making to enhance efficiency [14].

While the need for evidence to inform management on communication policy remains pivotal, little is known about the type of communication medium that would best serve

the needs of hospital management. It remains uncertain whether the anecdotal evidence on the existing communication mediums used in the hospital is effective from multi-stakeholder perspective.

The present study was therefore conducted to identify the mediums used, how effective they have been (effectiveness would measure the extent to which the communication medium is able to achieve the goals for which they were primarily adopted), and the communication medium preferred by hospital management, healthcare workers, and clients assessing care at the Komfo Anokye Teaching Hospital.

2. Methods

The study employed a cross-sectional design with a multi-level sampling method to select a total of 650 respondents consisting of 303 clients, 303 health workers, and 44 hospital directorate managers for the study. A purposive sampling was first used to select 10 directorates based on their provision of outpatients services. Within these 10 clinical directorates are various groups of health professionals (doctors, nurses and midwives, pharmacist, allied health, and clinical support staff) and patients who visit the directorates for health services. To get the estimated total sample of each category of health workers and patients, a proportion to sample size method was employed to estimate the number of participants to be selected in each of the included directorates. Simple random was then employed to select the respondents in the study at the directorate level. The total management staff of the hospital was 44. All of them were purposively selected.

A structured questionnaire was used to collect data from respondents.

The study was conducted at the Komfo Anokye Teaching Hospital (KATH), Kumasi, Ghana, from October to November 2018. The hospital is located in the vibrant and culturally rich city of Kumasi, the regional capital of Ashanti, with a population of about 4.7 million [10]. It is the second largest hospital in Ghana, and the only tertiary institution in the Ashanti Region. It serves as a major referral center for the northern sector of Ghana. The hospital has a staff population of 3,909 who fall under these categories; doctors (9.4%), top management (1.1%), nurses and midwives (42.2%), certified registered anesthetist (1.3%), pharmacists and pharmacy technicians (3.8%), administration and finance (6.6%), clinical support staff (10.9%), allied health personnel (5.6%), and cleaners and security officers (19.1%). The study enrolled three categories of respondents. These included directorates managers, health professionals (doctors, nurses, pharmacists, allied health staff, and clinical support staff), and outpatients seeking healthcare and treatments at the hospital. The rationale for the inclusion of the directorates managers and the health professionals was because they either had or continue to have direct communication with clients during consultation, diagnostics treatment, and administrative interactions. Staff without direct engagement with health seeking clients or who were a part of the administrative management team of the hospitals were

excluded. Terminally ill clients were excluded as they were deemed incapacitated to provide informed consent. Non-voluntarily consenting clients were excluded from the study.

Health professionals were randomly contacted during working hours of the day. The study processes (rationale, risks, and benefits) were explained to them. Managers of the hospital who met the inclusion criteria were preinformed of the study. This was followed by a scheduled meeting to explain the study and their respective consents were sought. Clients were randomly sampled during their out-client visits. Detailed information about the study was provided to them and their consents sought. Participants who consented voluntarily were recruited in the study.

Primary data were obtained from participants using a structured interviewer-administered survey questionnaire. Information was gathered on the communication mediums available for clients' and health professionals' interactions and possible challenges emanating from the media used in Komfo Anokye Teaching Hospital (KATH).

Three different questionnaires were designed and used. Each was used independently on the three different populations (health workers, clients, and directorate managers). The reason was that each category has different ways of interacting within the hospital, hence the different measuring tools. Prior to the data collection, the questionnaire was pretested at the Kwame Nkrumah University of Science and Technology (KNUST) hospital located in Kumasi to ensure the validity and reliability of the data to be collected from the study. Responses, opinions, and views generated from the pretesting exercise were used as a guideline to review and refine the data collection tools used in the study.

Data collected in this study included variables for communication mediums used such as emails, letters, text messaging, phone calls, and direct interactions. Effectiveness of media as variable was described to respondents as the extent to which the communication media used are able to achieve the desired goals within the context of their operations (healthcare management, internal communication, and client-physician engagement). In the context of our study, social media was described to respondents as WhatsApp medium of communication. This was due to the fact that it is the commonest social medium used in the study setting. Open Data Kit (ODK) was used to collect the data. The data were cleaned and imported into STATA version 16.0 (StataCorp, 4905 Lakeway Drive Station, Texas 77845, USA) for statistical analysis. Descriptive statistics were performed for all variables as proportions and presented using tables.

3. Results

3.1. Communication Mediums as Examined by Clients. Out of the 303 clients interviewed on the mediums for internal communications, a few ($n=8$, 2.6%) identified emails as the usual media for communicating with care providers, and majority ($n=248$, 81.9%) indicated they normally used direct means (face-to-face) for all enquiries at the hospital. About 14.2% ($n=43$) clients preferred communicating through meetings with health professionals

whereas 10.6% ($n=32$) usually communicated with professionals through social media (mainly WhatsApp). A proportion of about 4.3% ($n=13$) clients indicated that they normally communicate with providers through letters/notes in hand, especially when referred from other facilities, and 11.5% ($n=35$) of them usually used telephone calls for interacting with their care provider (doctor) within the hospital.

With respect to the type of mediums used for external (before hospital visits) communications, few clients ($n=8$, 2.6%) opted for emails as the usual means of communicating with providers. A section of about 28% ($n=85$) preferred having direct contact (face-to-face) with care provider before the scheduled visit date. About 5.3% ($n=16$) of clients normally used social media for discussions and enquiries, and 26.4% ($n=80$) indicated that they usually used telephone calls to contact the hospital before coming to the hospital.

Assessment of the effectiveness of the mediums employed during external communication shows 29.4% ($n=89$) of respondents viewing the mediums to be effective (Table 1).

3.2. Communication Mediums as Examined by Health Workers. The mediums used for staff-to-management communications, staff-to-staff communications, and staff-to-client communications were examined and are reported in Table 2. It also shows a detailed description and rating of the performance of the various mediums used for communication.

Among the various mediums assessed, memos were observed to be used by more than half ($n=171$, 56.4%) of the staff, while 5.9% ($n=18$) used emails to interact with management of the hospital, respectively. Close to ninety percent ($n=272$, 89.8%) of the staff resorted to face-to-face as a medium to communicate with each other and about 97.4% ($n=295$) communicate with their clients face-to-face (Table 2).

3.3. Communication Mediums as Examined by Management. The views of management members were sought on the purpose and various mediums or channels used for communication at the hospital and reported in Table 3. Half ($n=22$, 50%) of the management agreed that the current mediums were used to notify staff of changes in the hospital. Close to half ($n=21$, 47.7%) of the management agreed that the current mediums were used to notify the public and clients on the available services at the hospital, while 38.6% ($n=17$) disagreed with that. About 45.5% ($n=20$) of the management agreed that messages sent through the mediums were relevant while 38.6% were in disagreement with that. More than sixty percent ($n=28$, 63.6%) and almost half ($n=21$, 47.7%) of the management agreed that messages sent through the mediums were consistent and credible, respectively.

Respondents indicated some mechanisms used for disseminating feedback at the hospital as follows: feedback through surveys ($n=16$, 36.4%), feedback through

TABLE 1: Communication mediums as examined by patients.

Variable	No (n = 303)	Yes (n = 303)
Mediums used for communication at the hospital		
e-mail	97.4	2.6
Face-to-face	18.1	81.9
Meetings	85.8	14.2
Social media	89.4	10.6
Letters	95.7	4.3
Telephone	88.5	11.5
Mediums used to contact the hospital before coming		
e-mail	97.4	2.6
Face-to-face	72	28
Meetings	95.7	4.3
Social media	94.7	5.3
Letters	94.4	5.6
Telephone	73.6	26.4
No medium used	56.8	43.2
Effectiveness of communication medium used before coming to the hospital		
Very effective	18	5.9
Effective	89	29.4
A little effective	45	14.9
Not at all effective	20	6.6
Very effective	34	11.2
Not at all effective	31	10.2

Source: Field Data (2018).

TABLE 2: Communication mediums as examined by health workers.

Variables	Yes (%)	No (%)
Staff-to-management		
Meetings	64.4	35.6
Memo	56.4	43.6
Letter	51.5	48.5
Face-to-face	50.2	49.8
Telephone	42.2	57.8
Social media	16.2	83.8
e-mail	5.9	94.1
Staff-to-staff		
Face-to-face	89.8	10.2
Telephone	66.0	34.0
Meetings	65.0	35.0
Social media	54.8	45.2
Memo	38.9	61.1
Letter	28.7	71.3
e-mail	11.5	88.5
Staff-to-patient		
Face-to-face	97.4	2.6
Telephone	42.6	57.4
e-mail	2.0	98
Meetings	20.5	79.5
Social media	19.8	80.2
Letter	14.2	85.8

Source: Field Data (2018).

anonymous response cards (n = 15, 34.1%), and feedback through direct contact with supervisors (n = 28, 63.6%). About one-third of the management (n = 15, 34.1%) rated the communication mediums as effective in gathering feedback.

TABLE 3: Communication mediums as examined by management.

Variable	Freq. (n = 44)	Percentages
Mediums notify staffs of changes		
Strongly agree	8	18.2
Agree	22	50.0
Disagree	14	31.8
Mediums notify patients/public about available services		
Strongly agree	3	6.8
Agree	21	47.7
Disagree	17	38.6
Strongly disagree	3	6.8
Messages sent through the mediums are relevant		
Strongly agree	5	11.4
Agree	20	45.5
Disagree	17	38.6
Strongly disagree	2	4.6
Messages sent through the mediums are consistent		
Strongly agree	3	6.8
Agree	28	63.6
Disagree	14	38.8
Strongly disagree	1	2.3
Messages sent using the mediums are credible		
Strongly agree	3	6.8
Agree	21	47.7
Disagree	17	38.6
Strongly disagree	3	6.8
Feedback gathered through survey		
Strongly agree	1	2.3
Agree	16	36.4
Disagree	21	47.7
Strongly disagree	6	13.6
Feedback gathered through anonymous response cards		
Strongly agree	2	4.6
Agree	15	34.1
Disagree	21	52.3
Strongly disagree	4	9.1
Feedback gathered through direct contact with supervisors		
Strongly agree	7	15.9
Agree	28	63.6
Disagree	8	18.2
Strongly disagree	1	2.3

Source: Field Data (2018).

Respondents shared their views on the effectiveness of the various communication mediums in Table 4 as follows: emails were identified as effective sometimes (n = 24, 54.5%) while face-to-face medium was noted by 45% (n = 20) of respondents as effective all the time. Meetings and social media were noted as effective sometimes by 68.2% (n = 30) and 61.4% (n = 27) of management members, respectively, while 22.7% (n = 10) endorsed newsletters as effective means of communication (Table 4).

With regard to efficiency of the mediums used, 56.8% (n = 25) and 45.5% (n = 20) of the respondents viewed email and face-to-face, respectively, as efficient sometimes. Again, meetings and social media were noted by 59.1% (n = 26) and 56.8% (n = 25), respectively, as efficient and 52.3% (n = 23) cited newsletter as efficient sometimes. Telephone and memos usage were indicated as efficient sometimes by 65.9%

TABLE 4: Communication mediums effectiveness as examined by management.

Variable	Freq. (<i>n</i> = 44)	Percentages
Medium is effective for feedback		
Strongly agree	3	6.8
Agree	15	34.1
Disagree	25	56.9
Strongly disagree	1	2.3
Effectiveness of email as a channel		
All the time	6	13.6
Sometimes	24	54.5
Not at all	14	31.8
Effectiveness of face-to-face as a channel		
All the time	20	45.4
Sometimes	19	43.2
Not at all	5	11.4
Effectiveness of meeting as a channel		
All the time	12	27.3
Sometimes	30	68.2
Not at all	2	4.55
Effectiveness of social media as a channel		
All the time	9	20.5
Sometimes	27	61.4
No at all	8	18.2
Effectiveness of letters as a channel		
All the time	10	22.7
Sometimes	18	40.9
Not at all	16	45.4
Effectiveness of telephone as a channel		
All the time	11	25
Sometimes	27	61.4
Not at all	6	13.6

Source: Field Data (2018).

(*n* = 29) and 61.4% (*n* = 27) respondents, respectively. Generally, the communication mediums used at the hospital were rated by 38.6% (*n* = 17) of the management as good (Table 5).

4. Discussion

This study examined the communication mediums used by health workers, management, and clients who access care from the Komfo Anokye Teaching Hospital in Kumasi, Ghana.

This study stems from the possibility that communication media may vary in the meaning and the sense of the information that is being transferred if not used in the right perspective [15]. That is, in some settings across the globe, mobile phone communication has proven to be effective in information sharing among healthcare professionals [6] in recent years. However, this result is not consistent across the entire spectrum of healthcare providers in different settings. In other jurisdictions, there is greater reliance on face-to-face approach as a medium of communication in hospitals though the growing digitization and technological advances threaten the continuing reliance on face-to-face interaction for medical and healthcare provision at all times [16]. The high figures reported on face-to-face in this current study in

TABLE 5: Communication mediums effectiveness as examined by management.

Variable	Freq. (<i>n</i> = 44)	Percentages
Emails are efficient		
All the time	5	11.4
Sometimes	25	56.8
Not at all	14	31.8
Face-to-face is efficient		
All the time	15	34.1
Sometimes	20	45.5
Not at all	9	20.4
Meetings are efficient		
All the time	10	22.7
Sometimes	26	59.1
Not at all	8	18.2
Social media is efficient		
All the time	12	27.3
Sometimes	25	56.8
Not at all	7	15.9
Letters are efficient		
All the time	8	18.2
Sometimes	23	52.3
Not at all	13	29.5
Telephone use is efficient		
All the time	10	22.7
Sometimes	29	65.9
Not at all	5	11.2
Memo is efficient		
All the time	14	31.8
Sometimes	327	61.4
Not at all	3	6.8
General performance of mediums		
Excellent	5	11.4
Good	17	38.6
Poor	7	15.9
Very good	11	25
Very poor	4	9.1

Source: Field Data (2018).

Kumasi, Ghana, during client-staff (81.9%) and staff-staff (89.8) interactions as the most commonly identified medium of communication are in tandem with the global trend. The adoption and preference for face-to-face in the health communication space is not unique to Ghana but both has a global reflection and is more pronounced in many health-sector establishments in many resource limited settings as observed by Travers in 2016 [16].

Although face-to-face medium appears to be the ideal and rational means of communication in Ghana, it does not adequately address the communication problems in the health system [16] especially among clients with speech and hearing impairment [14, 17]. The unevenness in the use of face-to-face communication as the preferred communication medium among healthcare providers has been documented in previous studies by Niemi and colleagues. Health workers and clients in those countries make use of ICT for communications using mediums such as the emails and text messages in their routine work [17]. This gives clients such as those with speech and hearing impairment the chances to

communicate better during seeking of healthcare. This observation runs contrary to the finding made in our present study. The study found very low preference for the use of electronic communication medium such as emails during interactions among clients-staff (2.6%), staff-staff (11.6%), and staff-management (5.9%), respectively, despite the acknowledged importance over other mediums of communication. Reasons for the non-frequent use of electronic communication media for healthcare seeking and management were not explored despite the acknowledgment of the role low level of ICT skills play in adopting electronic communication for healthcare among clients, hospital managers, and hospital staff. Nonetheless, as reported in previous studies, communicating using electronic means such as emails ahead of others gives the ability to revert to pending tasks [17]. Likewise, one can take care of matters by email when it is convenient for you and as a matter of convenience [17].

The real burden of using inefficient medium of communication and its challenges to clients and health professionals was not a major priority under the scope of this study and should be investigated. However, the revelations from this study reinforce the need to incorporate electronic communication into the current health system in Ghana particularly in teaching hospitals and other referral hospitals.

5. Conclusion

The mediums clients used for enquiries from the hospital were mainly telephones. Within the hospital, clients' communication was however limited to verbal via face-to-face. Staffs mostly used social media and face-to-face method to interact with their colleague staffs. However, they communicated with clients by face-to-face only. Management also used memos more often to communicate with staffs and clients than the traditional verbal means via face-to-face. The current mediums of communication allowed management to notify staffs of relevant administrative changes and other information in the hospital. However, getting feedback through the same mediums seemed poor.

There exist heterogeneous communication mediums used during internal and external communication. Heterogeneous system of communication may lead to lack of information and or truncation of information flow. Developing a systematic way of information using a common information platform will improve access to health.

6. Limitation of the Study

The descriptive exploratory nature of the study did not allow for the testing of associations and the conduct of robust quantitative analysis. Another limitation of the study stems from the possibility of social desirability bias. This is because participants may underreport or overreport. This is because they may feel either shy or fear to openly talk to data collection team. The study was done at only one tertiary hospital; hence, extrapolating the findings to the entire healthcare system will not be entirely correct. Further, the

authors measured effectiveness of communication mediums just from managers' perspectives. This does not give a clearer picture on the other perspectives. Finally, the individual respondents may have their own opinion on communication and may affect their responses.

Abbreviations

CHRPE: Committee of Human Research, Publications and Ethics
 KReF: KNUST Research Fund
 KNUST: Kwame Nkrumah University of Science and Technology
 KATH: Komfo Anokye Teaching Hospital
 ICT: Information and communication technology
 ODK: Open Data Kit.

Data Availability

The datasets generated during the current study are available from the corresponding author on reasonable request.

Ethical Approval

Written approvals were, respectively, obtained from the Komfo Anokye Teaching Hospital and the Committee on Human Research, Publications and Ethics (CHRPE) of KNUST with registration number CHRPE/AP/591/18 before the study was conducted.

Consent

Participants read, understood, and signed a written informed consent to be part of the study. The consent form contained detailed information of the study and participants were given enough time to make an informed decision before enrolling in the study. Participants also consented to the publication of this work when the need arises.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

DA, MD, FAO, and SN designed the study. JB, EKA, KL, EXA, AA, DA, BAD, AKO, SCYAP, and NKM collected the data and cleaned and analyzed the data. MD and FAO drafted the initial manuscript, which was reviewed by all authors. All authors read and approved the final manuscript and are accountable for the content.

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References

- [1] WHO, *OECD TWB: Delivering Quality Health Services* <http://apps.who.int/bookorders>, p. 100, WHO, Geneva, Switzerland 2018.
- [2] H. Ratna, "Importance of effective communication in healthcare practice," *Harvard Public Health Review: A Peer-Reviewed Journal*, vol. 23, 2019, <https://harvardpublichealthreview.org/healthcommunication/>.
- [3] IGI-Global, *What is Communication Media* IGI-Global, PA, USA, 2017, <https://www.igi-global.com/dictionary/communication-media/4637>.
- [4] R. H. Lengel and R. L. Daft, "Selection of communication media as an executive skill," *California Management Review*, vol. 29, no. 2, pp. 112–127, 1988.
- [5] M. S. Kim, M. R. Aro, K. J. Lage, K. L. Ingalls, V. Sindhwani, and M. K. Markey, "Exploring the usability of mobile apps supporting radiologists' training in diagnostic decision making," *Journal of the American College of Radiology*, vol. 13, no. 3, pp. 335–343, 2016.
- [6] C. L. Ventola, "Mobile devices and apps for health care professionals: uses and benefits," *P & T: A Peer-Reviewed Journal for Formulary Management*, vol. 39, no. 5, pp. 356–364, 2014.
- [7] M. S. Boateng, "The role of information and communication technologies in Ghana's rural development," *Library Philosophy and Practice*, vol. 871, 2012.
- [8] A. D. Hanchate, M. K. Paasche-Orlow, W. E. Baker, M.-Y. Lin, S. Banerjee, and J. Feldman, "Association of race/ethnicity with emergency department destination of emergency medical services transport," *JAMA Network Open*, vol. 2, no. 9, p. e1910816, 2019.
- [9] J. Bush, D. E. Barlow, J. Echols, J. Wilkerson, and K. Bellevin, "Impact of a mobile health application on user engagement and pregnancy outcomes among Wyoming medicaid members," *Telemedicine and E-Health*, vol. 23, no. 11, pp. 891–898, 2017.
- [10] X. Chen, M. Koskela, and J. Hyv akk a, "Image based information access for mobile phones," in *Proceedings of the 2010 International Workshop on Content Based Multimedia Indexing (CBMI)*, pp. 130–135, Grenoble, France, June 2010.
- [11] C. Barkman and L. Weinehall, "Policymakers and mHealth: roles and expectations, with observations from Ethiopia, Ghana and Sweden," *Global Health Action*, vol. 10, no. sup3, 2017.
- [12] A. E. Lefevre, D. Mohan, D. Hutchful et al., "Mobile technology for community health in Ghana: what happens when technical functionality threatens the effectiveness of digital health programs?" *BMC Medical Informatics and Decision Making*, vol. 17, no. 1, p. 27, 2017, <https://bmcmedinformdecismak.biomedcentral.com/articles/10.1186/s12911-017-0421-9> [Internet].
- [13] P. A. Abor, "Exploring clinical communication in a teaching hospital in Ghana," *International Journal of Health Governance*, vol. 24, no. 2, pp. 155–168, 2019.
- [14] A. Rahman and A. Shaban, *Lack of Beds Forces Ghana's Main Hospital to Reject Critical Referrals* Africanews, Lyon, France, 2018, <https://www.africanews.com/2018/07/11/lack-of-beds-forces-ghanas-main-hospital-to-reject-critical-referrals/>.
- [15] J. Meyrowitz, "Medium theory," 2020. Communication theory.org <https://www.communicationtheory.org/medium-theory/>.
- [16] C. Travers, "Does the future have room for face to face communication," 2016, <https://www.burleigh-court.co.uk/assets/docs/face-to-face-communication.pdf>.
- [17] M. Koivunen, A. Niemi, and M. Hupli, "The use of electronic devices for communication with colleagues and other healthcare professionals - nursing professionals' perspectives," *Journal of Advanced Nursing*, vol. 71, no. 3, pp. 620–631, 2015.