GROEP BIOMEDISCHE WETENSCHAPPEN
HERESTRAAT 49, O&N II – BUS 700
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MASTERPAPER PROTOCOL: PROSPECTIVE STUDY USING OTHER NON-SPECIFIED RESEARCH DESIGN

Approved by EC Research UZ Leuven / KU Leuven - MP022375

1. APPLICANTS

Protocol - full title	Physicians' preferences for the use of clinical decision support systems in the context of acutely ill children presenting to ambulatory care: A focus group study
Version 1: Date submission	Date: 27/12/2022
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Following both questions should be answered:	
The principal investigator is a health professional according to the Law of 10 May 2015. YES ☒ NO □	
The supervisor has read and approved the submission for ethics approval. YES ☒	
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2. BACKGROUND AND RATIONALE

The desired effects of antibiotics are being compromised by the rapid escalation of **antimicrobial resistance (AMR)**, which is considered a major global health threat (1). In 2019, there were an estimated 1.27 million deaths attributable to bacterial AMR globally (2).
Diagnostic uncertainty is a main driver of **antibiotic over-prescribing** by GPs (3). **Children** are particularly at risk for unnecessary antibiotic prescribing. Childhood infections are often self-limiting and caused by viruses (4). Only 1% of acutely ill children attending primary care will be diagnosed with a serious infection needing antibiotic treatment (for example pneumonia, urinary tract infection, meningitis, or sepsis) (5). Distinguishing non-severe from serious infections is difficult, especially in the early stages of the disease where signs and symptoms are unspecific (5). Early recognition and adequate referral of a serious disease could prevent unnecessary investigations, referrals, treatments (including antibiotic prescriptions) and hospitalisations in children without a serious illness, avoiding traumatic experiences for the child, parental concerns and health care expenditures (6).
A **clinical decision support system (CDSS)** is intended to improve healthcare delivery by enhancing medical decisions with targeted clinical knowledge, patient information, and other health information (7). Despite its potential to improve the clinical decision-making process, clinicians do not always use CDSSs in such a way that their potential can be fully realized (7). Insight into barriers and facilitators, preferably in a specific context, is needed to improve the acceptance of CDSSs (7). Factors are most often related to (a lack of) usefulness and relevance of information, ease of use and efficiency of the system (7).
A widely used CDSS is the French system: Antibioclic. It is a publicly funded CDSS for antibiotic prescribing in primary care that provides personalized antibiotic recommendations for 37 infectious diseases (8). Antibioclic is freely available on the web and as a smartphone app (8). The number of users of Antibioclic has been steadily increasing over time, with no saturation effect (8). However, no CDSS has been introduced at a large scale in Belgium. With this focus group study, we aim to investigate the barriers and facilitators and the preferred manner of delivery of a CDSS, in the context of acutely ill children presenting to ambulatory care in Belgium.

3. STUDY OBJECTIVES

Primary objective: To investigate the preferred manner of delivery of a CDSS in the context of acutely ill children presenting to ambulatory care in Belgium.
Secondary objective: To investigate barriers and facilitators for the use of a CDSS in the context of acutely ill children presenting to ambulatory care in Belgium.

4. RESEARCH METHOD

We will perform synchronous focus group discussions among ambulatory care physicians treating acutely ill children. We will perform the discussions in person, unless COVID-19 measures do not allow for this. We will pilot the content and design of the focus group discussions with one physician who also has some research experience, if this is deemed necessary at the time. During the discussions at least one moderator and at least one observer from the research team will be present. The moderator will begin the interview with providing some general information of the principle of clinical decision support systems, so that all participants have a shared basic idea. The topics to be explored or open-ended questions that will be posed during the focus group discussions are listed in the 'Interview Guide' as annex.
Adhering to the principles of grounded theory, the researchers will reflect after each interview in order to come up with ways to improve the next interview in any way possible, including methods to obtain data that better answers the research question(s).
Since the participants will also have the opportunity to submit comments via email up to a week after the focus group, there will also be an asynchronous aspect.

5. SELECTION AND WITHDRAWAL OF PARTICIPANTS

5.1 Inclusion and exclusion criteria

We will recruit Belgian ambulatory care physicians treating acutely ill children (i.e., general practitioners, paediatricians, and ear/nose/throat physicians). A condition for participation in the study is the use of an electronic medical record. Physicians will be purposively sampled to obtain variation in gender (i.e., male and female), experience (i.e., number of years active as a doctor), specialty (i.e., general practitioner, paediatrician, ear/nose/throat physician), practice setting (i.e., solo and group practice), and rurality (i.e., urban and rural).

5.2 Sample size and population

We will perform focus group discussions until theoretical saturation is reached. We will include 5 to 10 participants per group, based on previous studies on CDSS use in primary care (9-12). The exact number of sessions cannot be determined in advance, but based on previous research we expect to perform three to four interviews (9-12). The physicians in the focus groups are representative for physicians working in Belgium. Sufficient variety is ensured among the physicians.

5.3 Recruitment

The investigators will invite participants by mail or phone to participate in the study that will take place at the Academic Centre for General Practice (Leuven), Onderwijs en Navorsing (campus Gasthuisberg, Leuven), or at a practice near the participants. Physicians will be recruited from across Flanders (i.e., the Dutch-speaking part of Belgium). A wide network of physicians was already built up from previously conducted studies by the research centre. Physicians will only be contacted if they gave approval for this in previous studies. We will ask physicians to participate according to the principles of purposive sampling. If needed, we will recruit physicians by advertising the study on relevant websites (i.e., epi-centre.be, facebook.com/achgkuleuven/, vvkindergeneeskunde.be, https://orl-nko.be/nl) and newsletters (i.e., contactblad Academisch Centrum voor Huisartsgeneeskunde, newsletter Corilus, newsletter Vlaamse Vereniging voor Kindergeneeskunde, newsletter Koninklijke Belgische Vereniging Voor Oto-Rhino-Laryngologie, Gelaat- En Halschirurgie).

When these people consent, a time will be scheduled when the study will take place. The informed consent form (ICF) will be delivered to the participant by mail in advance. This ICF clarifies the purpose,

method, and implications of the study; the possible benefits, risks, and disadvantages associated with participation; the possible external funding of the study, the processing of personal data, as well as the retention period and storage of these data. It also explicitly states that audio recordings will be made during the study. This ICF will be reviewed with the participant at the beginning of the focus group. Only when the participant agrees to the research and returns the signed ICF to the researcher, the research will start. The research will proceed as follows: we will investigate the preferred manner of delivery and barriers and facilitators of a CDSS in the context of acutely ill children presenting to ambulatory care in Belgium by performing focus groups with 5-10 participants. Each participant will attend one focus group with an estimated duration of 2 hours.

Both in the ICF and at the start of the focus group, it will be clearly stated that the person is not obliged to participate. Both for participating and not participating, as well as for ending the study early, there are no negative consequences for the person in question. Thereby, the research can be terminated at any time at the request of the participant. The data (including any audio clips) of uncompleted studies will not be included in the data analysis and will be destroyed.

There is an incentive in place for participating physicians: a coupon of 40 euros of Standaard Boekhandel. This will not be explicitly mentioned in the recruitment materials, as per the guidelines of the UZ Leuven Ethics Committee (13).

5.4 Expected duration

The study will begin January 2023. The end of the study is scheduled for June 2023. Each participant will attend one focus group with an estimated duration of 2 hours (travel time not included). Before the focus group, each participant will need some time to become familiar with the topic of the focus group, to schedule the moment of the focus group (i.e., having contact with the investigator), and to read the informed consent form. After the focus group, the participants have the opportunity to submit comments via mail up to a week after the focus group. In total, participants will take 3 hours to participate in this study.

6. ANALYSIS

After transcribing the focus group discussions, we will perform qualitative data analysis (14) using the latest version of QSR NVivo software. Following constructivist grounded theory, memos will be written before the coding starts. Coding will be done independently by two researchers (15). Cases of discrepancy will be solved by discussion or a third researcher if consensus cannot be reached. A codebook will be developed. The coding process will happen in three phases: open, focused, and axial coding. During initial (open) coding, we will focus on small units of analysis, coding line-by-line. During focused coding, we will look at frequent earlier codes to navigate through the data, and will discern initial codes with the most analytical strength. During axial coding, we will examine the relations between categories and subcategories of codes (16). Findings will be reported using the consolidated criteria for reporting qualitative research (COREQ) checklist (17).

7. DATA HANDLING AND MANAGEMENT

7.1 Data storage and management

For the collection and storage of the data, we use OneDrive for Business, provided by KU Leuven.

All data will be treated confidentially and with due care during the project. In function of our research question, preferences for the use of a CDSS for acutely ill children in ambulatory care will be collected

by means of focus groups. Only relevant information will be collected and this will be limited to what is necessary for the purposes of the research question. The information obtained through the research will be collected in a structured manner in a secured computer document. If possible, this file will be stored in a project- or team-based storage location on a KU Leuven or UZ Leuven server, in OneDrive for Business, provided by KU Leuven. Otherwise, a personal computer secured by password, two-step verification or specialized program such as 7-Zip or AEScrypt will be used.
Data allowing identification of participants will be pseudonymized. This means that personal data will be processed in such a way that it can no longer be attributed to a specific person without the use of additional information. However, the direct link between the data subject and the dataset will not be broken, but will be encoded using a code. This code contains neither the name, nor initials, nor elements that could lead to identification (e.g., date of birth or place of birth). The codes will be kept in a separate and encrypted file, only in the possession of the supervisor(s) and the students involved. This file will not be kept on the same laptop or desktop as the data files.
Anything said by the participants during the study will be recorded via audio recordings. The audio recordings will only be listened to and transcribed by the researchers. Immediately after transcription, the audio recordings, the diary entries, the interviewer's personal notes will be destroyed. Transcripts of the interviews will not include names or any other data that will allow identification. In the actual master's thesis, some excerpts from the interviews will be quoted in an anonymous manner and in such a way that it is not possible to trace the statement back to a particular participant. The transcripts will be kept in a secure computer document that is only in the possession of the supervisor(s) and the students involved. If possible, this file will be kept in a project- or team-based storage location on a KU Leuven or UZ Leuven server, in OneDrive for Business, offered by KU Leuven. Otherwise, a personal computer secured by password, two-step verification or specialized program such as 7-Zip or AEScrypt is used. GROUP BIOMEDICAL SCIENCE HERESTRAAT 49, O&N II - BUS 700 BE-3000 LEUVEN 2020.10 When sending a copy of confidential information or documents, they will always be encrypted with a password or unique code. For sending large files, Belnet Filesender will be used. Applications such as Google Drive, a personal OneDrive (with the exception of OneDrive for Business, offered by KU Leuven) or WeTransfer will be avoided at all times. Upon completion of the project, files will be delivered to the supervisor who will further ensure their safe keeping. In accordance with KU Leuven policy, these files will be kept for 10 years, after which it will be reassessed whether it is considered useful to keep the data any longer.

7.2 Declaration of Confidentiality and Careful Management of Information and Personal Data

In the framework of his / her Master's thesis, the student(s) will have access to all kinds of data, information, results and documents. In order to ensure the confidentiality of this Information and the privacy of those involved, within the framework of his / her Master's thesis the student(s) should always deal with the Information with the greatest care and discretion. In particular research related to patients and including the collection and analysis of personal data requires the utmost of care and discretion. Therefore, at all times the student must observe complete confidentiality with respect to the Information he / she has collected during the course of his / her Master's thesis.

In performing this research, the student(s) commit(s) him/herself to the following confidentiality obligations:

- He / she accepts, during and after the completion of the Master's thesis, the obligation to strictly observe the confidentiality of the Information he / she has collected and the activities

to which he / she has participated, and regarding the patients, healthy volunteers and the staff members with whom he / she comes into contact;

- He / she will only process and collect data that is relevant and necessary for his / her Master's thesis;
- He / she will not share information with persons not directly involved within the framework of his / her research; only the investigator, possible group members and his/her supervisor will have access to the data
- He / she will take all necessary steps to protect the confidentiality of Information and the privacy of those involved;
- He / she will handle with care and responsibility the Information and the access granted to him/her to information systems and digital media.
- He/ she will discuss the confidentiality, storage and sharing of files with his/her supervisor. He/she will use anonymisation or pseudonymisation in order to limit the risks of data leaks and data loss.
- If pseudonymisation is used, he/she will treat the pseudonymisation key or the encryption table containing the pseudonyms and the identifiable information fields with the same confidentiality as the original data. He/she will never store the key or encryption table at the same device (e.g. laptop or desktop) as the work file or database containing the pseudonymised data.
- Wherever possible, he/she will use a project based or team based storage location for storing and exchanging data. He/she will contact his/her supervisor to discuss the possibility of using an internal or external service of KU Leuven or UZ Leuven to save data. If not possible, he/she will use OneDrive for Business, provided by KU Leuven, or a password protected device for storing collected data. Applications such as Google Drive, a personal OneDrive (except OneDrive for Business, provided by KU Leuven) or WeTransfer will be avoided at all times.
- He/she will always encrypt confidential information and files with a password, two-step verification or specialized program such as 7-Zip or AEScrypt.
- When sharing a copy of strictly confidential data, he/she will always encrypt the data with a secure password or unique code. For sharing large files, a secure application such as Belnet Filesender will be used.
- In the event of a data breach he/she will immediately contact his/her supervisor

As this research is conducted in the context of a Master's Thesis, the legal basis for the processing of personal data is the public interest. This research will generate knowledge and new insights that (directly or indirectly) will benefit society.

All investigators shall treat all information and data relating to the study as confidential and shall not disclose such information to third parties or use such information for any purpose other than the performance of the study. The collection, processing and disclosure of personal data, such as participants' contact information, health information and medical information, is subject to compliance with the General Data Protection Regulation (GDPR).

When approval is given by the Ethics Committee, it is confirmed that the proposed processing of personal data meets the requirements of the GDPR. Consequently, from a GDPR perspective, there is no objection to start the processing operations. When approval is given, this application will, In accordance with the GDPR, become included in KU Leuven's register of processing activities in the

context of research and public service. No separate privacy application should be submitted for this type of studies.

8. ASSESSMENT OF RISKS AND SAFETY

This study poses very little to no physical safety risks to the participants.
If the focus group discussions take place online, we will use Microsoft Teams software. Consequentially, participants are not anonymous and may be visually recognized by one another. Additionally, this software provides user privacy protection. Although highly improbable, a breach in software security remains possible. Data that might be visible to other participants can include a participant's email address, IP-address, message content, and chat dialogues. These data may all be traceable and accessible at various times during and after the research effort. The researchers will make attempts at enabling anonymity (e.g., advising participants not to use their name or email address as a visible username in MS Teams), but they want to stress that full anonymity is not guaranteed.
In the case of in-person focus group discussions, the probability of participants recognising each other is slightly higher. Although unlikely to occur, interviewees could be involved in traffic accidents on the way to or from the interview.
All researchers involved have an up-to-date GCP certificate. The name of the Principal Investigator and other relevant point of contacts have been integrated in the ICF.

9. APPROVAL

Hereby we confirm that data collection is performed with approval of the head of the respective unit(s) or department(s) where data collecting is taking place.

Contact details Jan Verbakel:
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10. PUBLICATION POLICY

Publications will be coordinated by the Principal Investigator. Authorship to publications will be determined in accordance with the KU Leuven policy on authorship.

11. DIRECT ACCESS TO SOURCE DATA AND DOCUMENTS

The investigator(s) and the institution(s) will permit study-related monitoring, audits, ethical review and regulatory inspections (where appropriate) by providing direct access to source data.

12. REFERENCES

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13. ANNEXES

1. *A template of the **ICF** has been developed and is available on https://med.kuleuven.be/nl/obc/Documenten or https://med.kuleuven.be/nl/obc/Documents_en. This must be used as a basis and adapted where necessary.*

   In case an alternative template is being used, a motivation should be provided here.
   Please copy your information letter here.

2. *All relevant information and documents regarding your research design*

3. *Every **advertisement, flyer, poster**, etc. that will be used in the study should be added.*
   *If recruitment will be done through **social media** or by **mail**, please also add the text or illustration that will be used.*
4. *Other (if applicable)*