

Applying Large Language Models to Interpret Qualitative Interviews in Health Care

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Supplementary Results - LLMs applied to two interview datasets

Flu and vaccination study dataset:

We used the system prompt: "You are a helpful research assistant." and user prompt (individual interview): "Please tell me what themes are mentioned in the following interview transcript. Themes are short words or phrases that capture something important about the research topic and purpose as revealed in the interview. Please categorise themes based on the COM-B model (capability, opportunity, and motivation), and identify barriers and facilitators." User prompt for integration across different interviews: "Please integrate and summarise the following themes that have been identified in interview transcripts into a core set of key repeating themes, according to the COM-B model. Themes are short words or phrases that capture something important about the research topic and purpose as revealed in the interview." to integrate across the themes.

Results of executing gpt-3.5-turbo (ChatGPT-3.5) on the Newcastle study dataset are illustrated below;

After integrating and summarizing the identified themes from the interview transcripts based on the COM-B model, the core set of key repeating themes can be categorized as follows:

1. **Capability:**
 - Understanding and knowledge about the flu, its symptoms, and the flu vaccine.
 - Access to information sources like healthcare professionals, the internet, and official health resources.
 - Informed decision-making process regarding vaccination for children.
2. **Opportunity:**
 - Access to healthcare professionals for vaccination advice and appointments.
 - Challenges in accessing healthcare services and vaccine supply due to personal circumstances and logistical issues.
 - Communication with healthcare professionals and utilization of information sources for vaccination-related information.
3. **Motivation:**
 - Willingness to vaccinate children based on medical advice and concern for their health.
 - Personal experiences with vaccinations and health conditions influencing decision-making.
 - Social responsibility and collective benefit of vaccination for community health.
4. **Barriers:**
 - Lack of discussion with healthcare professionals about the flu vaccine for children.
 - Personal circumstances affecting access to healthcare and vaccination information.
 - Concerns about potential side effects and supply shortages impacting vaccination decisions.
5. **Facilitators:**
 - Trust in healthcare professionals and vaccination recommendations.
 - Utilization of reliable information sources and resources for decision-making.
 - Advocacy for vaccination, positive past experiences, and proactive approach to health protection.

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Overall, the integrated themes emphasize the importance of understanding, access to information, motivation, and addressing barriers and facilitators in the decision-making process regarding flu vaccination for children. Trust in healthcare professionals, personal experiences, and social responsibility play significant roles in shaping attitudes and behaviors towards vaccination. Addressing barriers such as communication gaps and logistical challenges, while leveraging facilitators like reliable information sources and proactive health behaviors, can enhance vaccination uptake and promote community health.

Clinician experiences study dataset:

We used the system prompt: "You are a helpful research assistant." **and user prompt (individual interview):** "Please tell me what themes are mentioned in the following interview transcript. Themes are short words or phrases that capture something important about the research topic and purpose as revealed in the interview. Please categorise themes as positive and negative experiences with digitalisation in the clinic. Please return only brief themes, no explanations." **User prompt for integration across different interviews:** "Please integrate the following into one list for positive experiences and one for negative, and summarise to key themes only." **to integrate across the themes.**

Below the result of applying Mixtral 7x8b to the first question of the interview study dataset:

Sure, I can help you organize these points into positive and negative experiences with digitalization, and summarize the key themes.

Positive experiences with digitalization:

- * Efficiency: Many participants reported that digital tools helped them save time and increase efficiency in their work. This was achieved through various means such as quick access to patient information, efficient search for ECGs, automatic data transfer from monitors, and time-efficient communication.
- * Quality improvement: Digital tools also helped improve the quality of work. For instance, dictation software helped improve letter writing, while digital anesthesia systems helped provide better patient care in critical situations. Digital tools also helped in early recognition of potential issues and avoiding repetition of unsuccessful treatments.
- * Convenience: Participants appreciated the convenience offered by digital tools. For example, mobile trolleys with medication and laboratory open, and quick access to personal settings were highly appreciated. Digital tools also allowed for remote access to clinics and work from home, which increased flexibility.
- * Modernization: Digital tools helped modernize various aspects of work such as efficient instrument tracking, in-house development of digital tools, and integration of tools into workflow.
- * Innovative tools: Participants also reported positive experiences with innovative databank tools, online conferences and presentations, and translation tools/apps for acute situations.

Negative experiences with digitalization:

- * Difficulty in use: Some participants reported that certain software made their lives more difficult. Digital tools were also reported to be difficult to use for some older patients. Additionally, there were challenges in determining the cause of liver damage due to lack of patient information in less encountered fields.
- * Dependence on proper usage: Digital tools require consistent scanning of screens and proper usage by everyone. If forgotten once, the system can become messed up. Similarly, less careful monitoring due to automation can lead to issues.
- * Lack of personal contact: Online conferences lack personal contact, and there is resistance to change when new tools like dictation tools are introduced.
- * Technical issues: Participants reported various technical issues such as tool malfunctioning during patient collaboration, slow operation, time-consuming reinstallation of apps, and inefficient manual documentation when apps don't work.
- * Generational differences: There were generational differences in perspectives towards digital tools, with some participants not feeling excited about them.

In summary, participants had positive experiences with digital tools that helped improve efficiency, quality of work, and convenience. However, there were challenges in using certain software, dependence on proper usage, lack of personal contact in online conferences, technical issues, and generational differences in perspectives towards digital tools.