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Communicating with hearing-impaired,

foreign patients, or through physical barriers:

ABC Stereo project overview and data gathered so far

UNIVERSITÀ DEL SALENTO

Ottavia Carlino

PhD student at the University of Salento

Presentation Outline

- ABC Stereo project: project aims and possible system design
- Advantages of real-time captioning in medical contexts
- Project stages
- Data gathered so far
- Summary of results
- Conclusions and future directions
- References

ABC Stereo project: project aims

A	Abbattere le
B	Barriere
C	Comunicative
S	Sottotitoli in
TE	TEmpo
RE	REale in
O	Ospedale

Breaking down communication barriers: real-time subtitling in hospitals

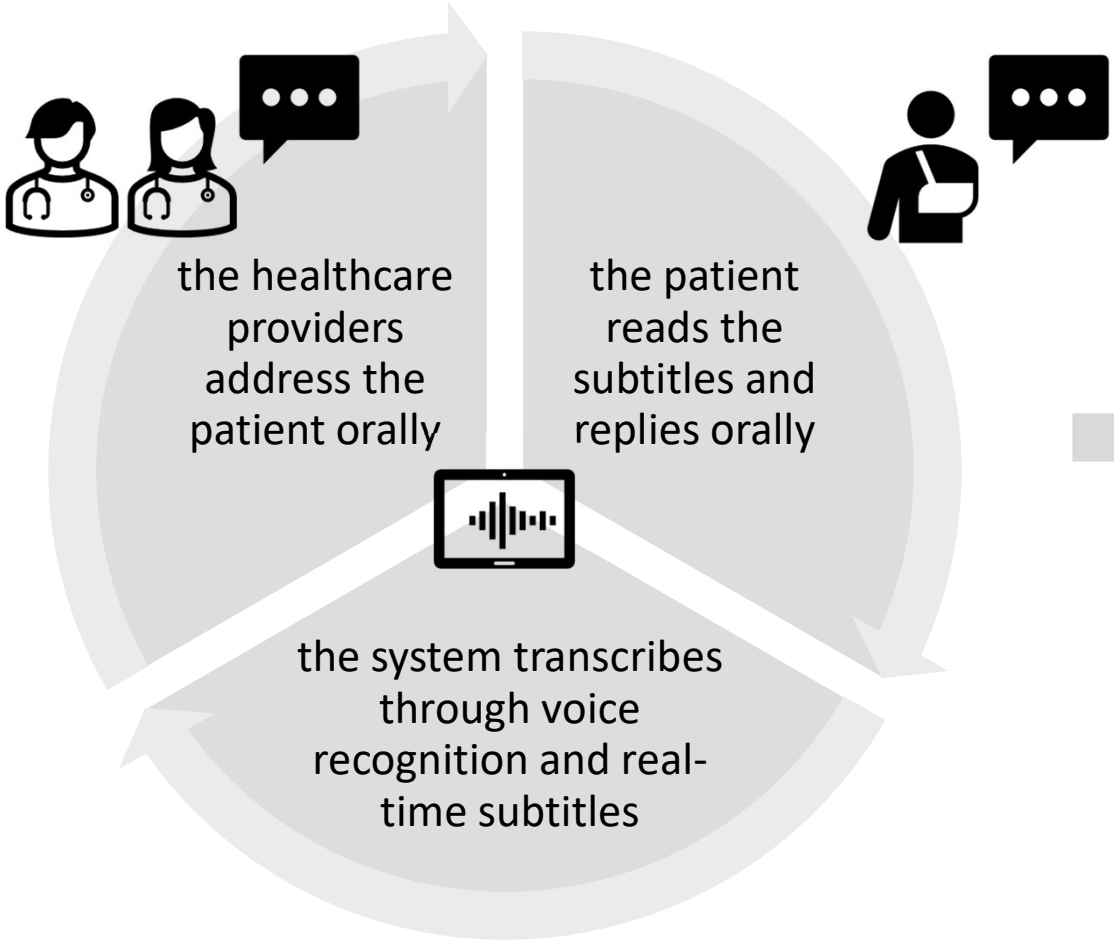
Real-time subtitling to facilitate doctor-patient communication in all those contexts where temporary or chronic conditions and/or physical or linguistic barriers make a normal spoken dialogue frustrating or even unsuccessful.

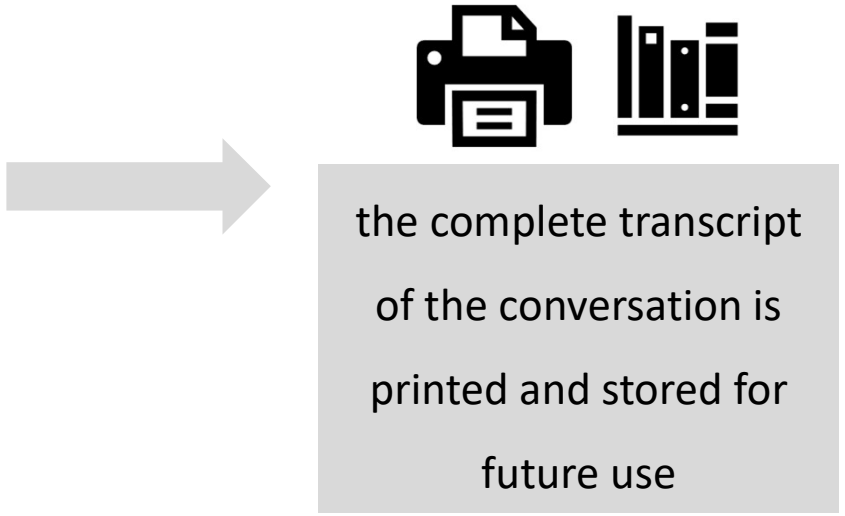
Hearing-impaired patients

Foreign patients

Physical barriers

ABC Stereo project: possible system design





Advantages of real-time captioning in medical contexts

Mixed oral-written communication to improve understanding

Printable transcript of the patient-doctor interaction

Transcribed information is more comprehensible than the medical report

A step towards a truly symmetrical doctor-patient relationship

Help in cases of medical malpractice.

Project stages

1. Theoretical study d/p communication available technologies

2. Data collection
   - Preliminary questionnaire
   - semi-structured interviews

3. Identifying the most suitable technologies for medical contexts.

4. Testing the system in nursing homes and hospitals

5. Identifying and fixing system shortcomings

Data gathered so far

- Preliminary questionnaire

Google Form → 88 replies

RQs:

1. To what extent are physicians and healthcare professionals required to communicate with patients in the presence of barriers?
2. How challenging is communication between health professionals and patients?
3. What modes of communication are currently used in healthcare settings and what are the main difficulties?
4. What are the needs of healthcare professionals and what is lacking in current communication methods?

- Semi-structured interviews

In-person or phone interviews → 46 replies

RQs:

1. Do physicians, nurses and social-health workers differ in the type of dialogue they have with patients?
2. Do physicians, nurses and social-health workers have different expectations of the features of the system?
3. Are there further possible uses for the system being studied?
4. Is there a difference in the disposition that healthcare professionals have towards the use of technology based on their age?

Summary of results: Preliminary questionnaire

1) communication is generally considered challenging

2) main difficulties: need to simplify the information,

inability to check the patient's actual understanding and

impossibility of transcribing the necessary information manually

3) time constraints prevented the participants from repeating the required information several times

4) the modes of communication used were generally considered unsuitable

5) written notes are already commonplace

6) willingness to use a transcription system.


dissatisfaction with the communication methods currently used


general willingness to adopt a new system


difficulty in establishing a fruitful relationship with the patient


time constraints that clinical practice inevitably entails

Summary of results: Semi-structured interviews

1) Type of dialogue:

- physicians and nurses in long-stay units → beyond just clinical data (longer dialogue)
- physicians and nurses in short-stay units → privilege clinical data
- Social-health workers → privilege the relationship with the patient

2) Possible uses of the system:

- communication disorders or cognitive deficits (dementia, Alzheimer's disease, and autistic)
- physically unable to have a direct dialogue with healthcare professionals (telemedicine services and hyperbaric chamber)

3) Concerns:

- Privacy
- Relationship
- Technology

The system

 should enable healthcare professionals to engage in a real dialogue with patients

 might be particularly useful in long-stay units

 should allow transcription while protecting the privacy (informed consent)

 Training is needed.

Conclusions and future directions

1) survey of patients

2) most suitable technology

Software → speech recognition software and mobile apps

Hardware → screen size and resolution, integrated or attached microphone, screen mounted on the bed, etc.

3) Testing the system in

- a nursing home

- a hospital unit

comparing the performance of professionals and the level of satisfaction and compliance of patients with and without it.

References

Bryman, A. (2012). *Social research methods.* New York: Oxford University Press.

Chodosh, J.; Weistein, B. E. and Blustein, J. (2020). «Face masks can be devastating for people with hearing loss», British Medical Journal, 370.

Keller, S., & Conradin, K. (2020, February 16). «Semi-Structured Interviews | SSWM - Find tools for sustainable sanitation and water management!» Retrieved from https://sswm.info/: sswm.info/planning-and-programming/decision-making/gathering-ideas/semi-structured-interviews

Mehandru, N.; Robertson, S. and Salehi, N. (2022). «Reliable and Safe Use of Machine Translation in Medical Settings», 2022 ACM Conference on Fairness, Accountability, and Transparency (FAccT '22), 17.

Motlhabi, M. B.; Tucker, W. D.; Parker, M. B., and Glaser, M. (2013). «Improving usability and correctness of a mobile tool to help a deaf person with pharmaceutical instruction», Proceedings of the 4th annual symposium on computing for development, 1-10. New York: Association for Computing Machinery.

Rahne, T.; Fröhlich, L.; Plontke, S. and Wagner, L. (2021). «Influence of surgical and N95 face masks on speech perception and listening effort in noise», PLoS ONE, 16 (7).

Trecca, E.; Gelardi, M. and Cassano, M. (2020). «COVID-19 and hearing difficulties», American Journal of Otolaryngology, 41 (4).

Turner, A. M.; Mandel, H. and Capurro, D. (2013). «Local health department translation processes: potential of machine translation technologies to help meet needs», AMIA annual symposium proceedings, American Medical Informatics Association, 1378-1385.