

# Evaluation of eHealth assistance in hospital care for improved quality of life in patients

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# Evaluation Design

- The evaluation is still on-going
- Theory of Change – a project of introducing eHealth technologies in a hospital, home care, and social services
- eHealth technologies selection
  - 1st step of selection - laboratory
  - 2nd step of selection - hospital
- Data collection – RCT (an a plan B)
- Current results

### Evaluation questions

- Do eHealth technologies provide better and more effective care that reduces health risks?
- How do assistive technologies affect clients' psychological well-being and social inclusion?
- What factors influence the attitude of other actors towards technologies?

### Evaluation methodology

- Data collection from clients (randomized approach), staff of partner organizations, families of clients, neighbours and other relevant actors of care, , data from technologies.
- Analysis of data with regard to the evolution of their values using procedures.
- Analysis of results and reporting to the implementation team.
- Interim and final evaluation reports.

### Impacts

- Technical solutions reducing health risks for clients.
- eHealth technologies contributing to the psychological well-being of clients and stakeholders.
- Verifying affects of eHealth technologies on the social inclusion of clients.

### Needs

- Growing disparity between supply and demand for specialised facilities due to an ageing population.
- Increasing workload of staff in specialised facilities.

### Inputs / Activities

- Definition of typical health limitations of clients.
- Determination of parameters.
- Defining the target groups, including diagnoses and the values to be monitored.
- Evaluating data over long time and in the context of the client/patient's life.
- Refinement of algorithms, and measured parameters.
- Implementation of the technical solutions.

### Outputs

- Description of the process of wiring the developed and tested system.
- Round tables with stakeholders (information transfer).
- Conferences on assistive technologies.

### Outcomes

- A system that will help people in need, their family members and specialist workers, to achieve a better quality of life and greater safety.

### Impacts

- Reducing pressure on specialist inpatient facilities, both in social and health care settings.
- Increasing the quality and accessibility of care, patient and client comfort, reducing the workload of staff.

# Step 1: Selection of technologies

- March – November 2020: Included 26 technologies
- Criteria:
  - Reliability (accuracy and quality of outputs from the technologies)
  - Repeatability of measurement
  - User-friendly control and installation
  - Low energy consumption
  - Open data format, availability of data to save
  - Possibility to transfer data (Wi-Fi, cable, necessity of connection to a server, non-standard connection)

# Step 2: Selection of technologies

- Testing in partners' premises (staff)
- Final selection of HW solution
- Implementation of SW system
- Criteria:
  - Does the technology saves time and effort of the staff?
  - Is the technology comfortable for patients?
  - Quality and accuracy of measurement in comparison to standard processes.

# Selected technologies

- The step shows that majority of technologies are not reliable or appropriate to institutional care.
- Our evaluation study tested five **oximeters** (heart pulse + saturation).
- five **thermometers** in the covid-19 unit
- together with a centralized application showing heart rate, temperature, and saturation online.
  
- Who was in a Czech hospital, knows that the staff measures temperature when the night and day services change – it means very early in the morning.

# Data collection

- RCT through a survey
- A Random selection at the end of the questionnaire.  
Questions intended to
  - (a) get know better the characteristics of the sample and
  - (b) use it for the propensity score matching if the RCT approach fails
- Availability of documentation about health risks to patients and burden to the staff
- Number of patients: 51
- All the data is anonymised, only staff knows the identity.

# The sample

	Supported	Not supported	p-value
N	22	24	
Average length of stay in hospital (days)	15.1	16.9	0.351 (t-test)
Reason for ending health care:			
Patient died	2	5	0.540 (chi-square)
Institutional care	4	4	
Released home	16	15	
Smokers	1	1	
Breathing problems	13	16	
University degree	2	7	
Men	13	14	



# Results



	Change of burden to staff		Patient died	
	Coef.	p-value	Coef.	p-value
Constant	-453.909	0.823	4.551	0.639
Support by eHealth	14.834	0.479	-0.086	0.481
Year of birth	0.242	0.817	-0.002	0.704
Gender	-6.836	0.737	-0.100	0.400
University degree	-10.767	0.669	-0.187	0.274
Length of stay	-0.140	0.902	-0.014	0.069
Problems with breathing	-7.728	0.700	0.139	0.269
Smoker	-32.654	0.321	-0.071	0.815
Diabetes	-7.034	0.693	0.051	0.690
Contact without limitations	-7.879	0.755	-0.402	0.053
Initial burden to staff			-0.002	0.432

# Results

- We have not proved that using eHealth technologies neither improves survival chances of covid-patients nor decreases burden of the staff.
- The staff confirmed satisfaction with the software solution in interviews.
- eHealth technologies have contributed to saving the time of the healthcare staff.
- The evaluation design is based on RCT approach which is not a common approach in Czech circumstances.

# Lessons learned

- On-line collection of data (the survey and measuring heart pulse, temperature, saturation).
- Adding randomization question at the end of the questionnaire helps to keep RCT clear (no cheating).
- Only a small sample
- Thermometers are small (staff took them with dead bodies without noticing it).
- Thermometers used to check changes in the temperature not to measure exact temperature.

# Lessons learned

- Valuable feedback from all partners
- Patient-centered and user-centered approach
- Unobtrusive solutions
- User acceptance
- Connected issues – data privacy, ethics, legal regulations
- The Covid-19 situation highlighted the urgency of applications providing the described functionalities, including telemedicine and telehealth services.



# Thank you for your attention!

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