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[P02] DIGITAL TECHNOLOGIES TO SUPPORT COMMUNICATION WITH ICU PATIENTS DURING WEANING FROM MECHANICAL VENTILATION: A SCOPING REVIEW

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Background and purpose

Intensive care unit (ICU) patients undergoing weaning from mechanical ventilation are usually unable to orally communicate and express their wishes, feelings and needs. This incurs high levels of stress to them [1;2]. Easy-to use and effective tools to facilitate communication with non-vocal ICU patients are lacking [3]. Digital sociotechnical systems hold the potential to significantly facilitate communication for these patients but there is limited information about the existing body of evidence, especially with regard to technical and functional characteristics, feasibility, clinical benefits or harms of such technologies.

The purpose of this research is to examine respective literature and to provide a systematic overview of the current status of digital sociotechnical technologies for early communication with non-vocal ICU patients. This review is part of the project *ACTIVATE* which aims to develop and pilot an ambient system to support communication, re-orientation and selfcare in ICU patients during the weaning period.

Methods

Scoping review based on the framework by Arksey and O'Malley [4].

Data sources and eligibility criteria

The databases Medline, Embase, CINAHL and IEEE (Institute of Electrical and Electronic Engineers) and additionally grey literature were initially searched in August 2017, with regular search updates every six months. The search strategy consists of four strings covering the target population (mechanically ventilated ICU patients, except neonatal or pediatric care), the intervention (digital technologies) and the outcomes of interest (communication and participation). Any type of study or project report addressing the target topics are eligible for inclusion (Fig. 1). Only publications in English and German are considered.

Population and setting:	Intervention:	Study type/Publication type:
• **Intensive care** or intermediate care • **Patients** undergoing **mechanical ventilation or weaning**	• Any kind of **information technology/ computer-based application** to **promote patients' communication** or participation	**Full reports** or **conference abstracts** reporting • Any kind of **knowledge synthesis** (systematic reviews, health technology assessments, reviews) • Any kind of **primary study** • **Case reports** • **Project reports**

Fig. 1: Inclusion criteria

Selection, data extraction and synthesis

Reference screening and data extraction are conducted by two researchers independently. Reported systems are classified as being either under development, piloting, evaluation or implementation. Aside from this classification and the type of publication/study no quality criteria are considered. Information is synthesised narratively.

Results

Four out of 785 papers retrieved were eligible for inclusion (Fig. 2). Except one, all of these papers report on sociotechnical systems at developmental stages (Table 1). Full study reports are rarely available. Therefore, information on the theoretical or methodological foundation of the digital systems under development or piloting is lacking. None of the four papers provide evidence of involvement of nurses, nursing researchers or patient representatives.

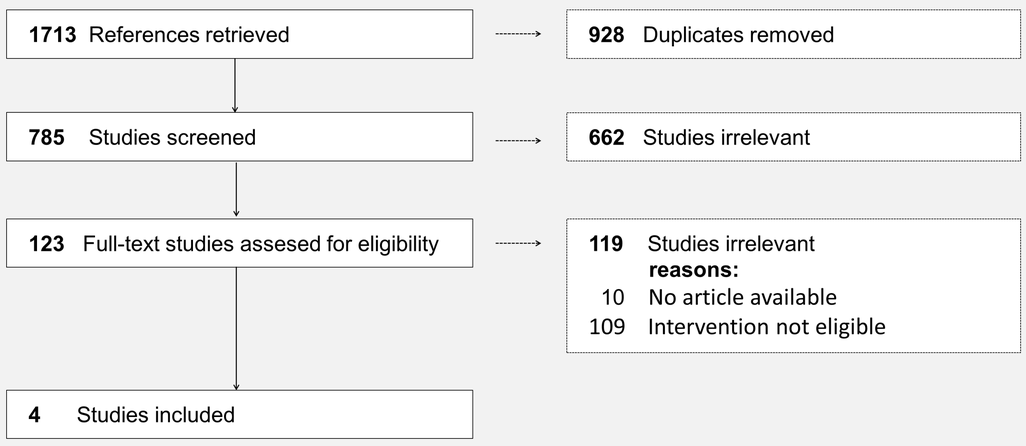

Fig. 2: Search retrievals and results of study selection

Author, year, country	Device		Publication type	Study type	Classification
Happ et al. 2014[5], USA		VidaTalk™: interactive, multi-lingual communication application for tablets for nonvocal and critically ill patients	Conference abstract	Mixed-methods study including 10 ICU patients	Piloting status
Javed et al. 2014[6], UK		Open-source system to effectively bridge the communication gap experienced by patients under weaning (easy-to-use input device (buttons), television, software)	Full paper	Description of technical infra-structure	Develop-mental status
Goldberg et al. 2017[7], USA		Manual-digital communication system for mechanically ventilated ICU patients	Conference poster	Description of technical infra-structure	Develop-mental status
Dehzangi et al. 2018[8], USA		Portable brain-computer interface for ICU patient communication using subject-dependent steady-state visual evoked potential- (SSVEP-) identification	Full paper	Diagnostic study with 10 healthy subjects	Develop-mental status

Table 1: Overview of included studies (Photos by the original authors)

Conclusions

Research about digital systems to promote communication with non-vocal/weaning ICU patients appears premature and insufficiently reported. Nursing researchers should become more involved in the development and evaluation of digital technologies for nursing care throughout all projects steps and support dissemination of and adherence to existing clinical research and reporting standards.

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