Korte inhoud

In oktober is het artikel 'Nurses identify organizational and educational requirements for technology-supported heart failure education: a qualitative study' verschenen in het European Journal of Cardiovascular nursing. Het XheaRt project onderzocht hoe hartfalenverpleegkundigen en thuisverpleegkundigen patiënteneducatie vormgeven. En hoe technologie hen hierbij kan helpen.

Het artikel lezen doe je hier (link naar artikel)

Nurses identify organizational and educational requirements for technology-supported heart failure education: a qualitative study.

Introduction

Chronic heart failure (CHF) affects an estimated 1-2% of the general population, rising to approximately 10% among those over 75.[1,2] Effective care therefore depends on strong strategies, including patient education and technology-supported interventions.

Patient education plays a pivotal role in improving outcomes: well-informed patients show better self-care, improved therapy adherence and lower (re)admission rates.[3,4] However, barriers exist, including time constraints among healthcare professionals (HCPs), language barriers, and cognitive impairment in patients.[5] Innovative technologies such as Extended Reality (XR), encompassing Virtual Reality (VR) and Augmented Reality (AR), are being explored to support both patients and HCPs, but their implementation must be carefully aligned with the needs of both. The XheaRT-study aims to understand these requirements by investigating current educational practices, identifying barriers, and evaluating conditions for successful technological adoption.

Methods

A qualitative research design was adopted. Between September and October 2024, ten online semi-structured interviews (approximately 45-60 minutes) were conducted in Dutch with purposively sampled nurses from four healthcare organisations. Interviews were transcribed verbatim by a professional transcription service and analysed using Braun and Clarke's six-phase thematic analysis.[6]

Participants were eligible if they were 1) employed as a specialist HCP in a cardiology department or as a primary care provider in one of the four partner organisations, 2) actively engaged with HF-patients, 3) involved in the care process of patients with CHF, and 4) proficient in Dutch. Sample adequacy was determined using information power, based on the relevance and richness of the data. Interviews explored perspectives on HF care, patient education, technology, and technology adoption.

. Coding was primarily conducted by KB, a female nursing scientist holding a PhD in Nursing sciences, SS, a male medical anthropologist holding a PhD in Public Health, and EV, a female MSC nursing student none of them had prior relationships with the participants. The researchers' interest stemmed from prior work experience as nurses or as nurse scientist. Therefore, the study was approached with the assumption that interviewers were well informed concerning the organisation of nursing care. This assumption was held openly throughout the study; care was taken to remain attentive to accounts that diverged from this expectation. [6,7] During the coding process all interview transcripts were read repeatedly to ensure thorough familiarization with the data. Primary coding was conducted by KB, reviewed by SS and discrepancies were resolved to consensus. Themes and subthemes were identified based on the coded data and were reviewed and refined throughout an iterative process.

Reporting followed the COREQ checklist.[8]

This study was approved by the ethics committees of Hospital xxx and hospital xx, xx (Z-2024012).

Results

Participants

Ten nurses (four male, six female; aged 34-58 years) participated. Six worked on a hospital cardiology ward and four in home care; nine held a bachelor's degree and one had vocational training. Four specialised in HF, and nearly all encountered HF-patients daily. Table 1 shows details of participants' training, experience, and identification codes.

Setting	**Role (HF-nurse/home care)**	**sex**	**Training**	**HF specialization Yes/No**	**Years in current setting**	**Code**
Hospital	HF-nurse	F	BSc Nursing	Yes	7Y	XR2zv04
	HF-nurse	F	BSc Nursing	Yes	4Y	XR2zv03
	HF-nurse	F	BSc Nursing	Yes	32Y	XR2zv02

	HF-nurse	F	BSc MSc Nursing	Yes	1Y	XR2zv01
	HF-nurse	M	BSc Nursing	Yes	6Y	XR1zv01
	HF-nurse	F	BSc Nursing	Yes	12Y	XR1zv02
Home Care	Home Care nurse	M	BSc Nursing	No	23Y	XR4zv01
	Home Care nurse	M	BSc MSc Nursing	No	4Y	XR4zv02
	Home Care nurse	M	BSc Nursing	No	2Y	XR3zv01
	Home Care Nurse	F	Vocational Nursing	No	18Y	XR3zv02

Table 1: overview of participants

three themes were identified.

Theme 1: Where does education happen and who "owns" it?

In hospital, education is structured and delivered by specialised HF-nurses within a multidisciplinary team, with dedicated time during admission, outpatient consultation and teleconsultation follow-up. In home care it is less structured and more opportunistic: nurses provide broad, practical education (diet, physical activity, medication adherence) and reinforce specialists' information, but lack dedicated time and must integrate it into routine tasks.

Home care organisations also lack specialised HF reference nurses, limiting the depth and consistency of education.

Theme 2: Barriers to effective education

Participants identified several barriers. Language was a significant barrier when patients could not fully understand the information, and low health literacy further complicated comprehension and lifestyle change. Age-related impairments (e.g. hearing or sight) and environmental factors, such as limited privacy in hospitals, also reduced effectiveness. Time pressure, especially in primary and home care, restricted thorough education. Other barriers

included patients' resistance to change, the difficulty of discussing sensitive topics such as advanced care planning, and miscommunication between HCPs across disciplines.

Theme 3: Conditions for adopting (XR-)technology

Most HCPs agreed technology should complement rather than replace human contact, and some felt it could enhance their knowledge. Successful implementation was seen to depend on four factors: policy, training, communication, and social support. Organisational policy must facilitate new technologies and provide adequate infrastructure (devices, IT support); training, including practical demonstrations and troubleshooting guidance, is essential for confident use; and effective internal communication supports adoption. Social dynamics also matter; team attitudes strongly influence acceptance, with positive leadership and peer support encouraging uptake and negative perceptions hindering it.

Discussion

This study highlights clear differences between hospital and home care. Hospitals provide dedicated time and specialised expertise, enabling more systematic education, whereas home care is often constrained by time, a discrepancy that may affect the quality and depth of patient education. The lack of formal recognition of education as a distinct nursing activity compounds this. While technology offers promising opportunities, its adoption is uneven and depends heavily on organisational support, training and workflow integration. Importantly, HCPs consistently emphasised that technology should enhance, not replace, human contact.

Recommendations

Several recommendations follow. First, patient education in primary care should be strengthened by allocating dedicated time and recognising it as a distinct nursing task, supported by standardised protocols to improve consistency and quality. Second, HCPs should be actively involved in selecting and implementing new technologies to ensure alignment with their workflow, with practical, accessible training and adequate technical support. Third, stronger

collaboration and regular interdisciplinary meetings between hospital and home-care nurses can improve information transfer and a more uniform educational approach. Finally, future research should evaluate the long-term effectiveness of educational approaches, including AI-supported and blended learning.

Limitations

This study has limitations. The small sample and exploratory design limit generalisability, and selection bias may have occurred, as participants interested in technology were more likely to take part. Only nurses were included, so the perspectives of patients and other HCPs were not captured, and the findings are specific to the Belgian health care system. Nonetheless, the study offers valuable insight into patient education in HF-care and important considerations for integrating technologies such as XR.

Figures and tables

1. Table 1: overview of participants.

References

1. Cowie MR, Wood DA, Coats AJ, Thompson SG, Poole-Wilson PA, Suresh V, et al. Incidence and aetiology of heart failure; a population-based study. *Eur Heart J* 1999;**20**:421-428.
2. Emmons-Bell S, Johnson C, Roth G. Prevalence, incidence and survival of heart failure: a systematic review. *Heart* 2022;**108**:1351-1360. doi: https://doi.org/10.1136/heartjnl-2021-320131
3. McDonagh TA, Metra M, Adamo M, Gardner RS, Baumbach A, Bohm M, et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. *Eur Heart J* 2021. doi: https://doi.org/10.1093/eurheartj/ehab368
4. Swiatoniowska-Lonc NA, Slawuta A, Dudek K, Jankowska K, Jankowska-Polanska BK. The impact of health education on treatment outcomes in heart failure patients. *Adv Clin Exp Med* 2020;**29**:481-492. doi: https://doi.org/10.17219/acem/115079
5. Murray MD, Tu W, Wu J, Morrow D, Smith F, Brater DC. Factors associated with exacerbation of heart failure include treatment adherence and health literacy skills. *Clin Pharmacol Ther* 2009;**85**:651-658. doi: https://doi.org/10.1038/clpt.2009.7
6. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative research in psychology* 2006;**3**:77-101.
7. Braun V, Clarke V. Reflecting on reflexive thematic analysis. *Qualitative research in sport, exercise and health* 2019;**11**:589-597.
8. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care* 2007;**19**:349-357. doi: https://doi.org/10.1093/intqhc/mzm042