Collaboration across Disciplines for the Health of People, Animals and Ecosystems
L. Stoicu-Tivadar et al. (Eds.)

doi:10.3233/SHTI241060

Preparing for Hospital at Home: A Review of the Current Landscape of Training Practices

Kerstin DENECKE[a,1] and Daniel REICHENPFADER[a]
[a] *Bern University of Applied Sciences, Institute for Patient-centered Digital Health, Biel/Bienne, Switzerland*
ORCiD ID: Kerstin Denecke https://orcid.org/0000-0001-6691-396X,
Daniel Reichenpfader https://orcid.org/0000-0002-8052-3359

Abstract. Hospital at Home (HaH) is a model of care that provides hospital-level care in the patient's home, requiring a unique set of competencies and skills from both multidisciplinary care teams and informal caregivers. These skills are often different from those required in traditional hospital settings. The aim of this paper is to consolidate the information of HaH-related education and training to support the development of standardized curricula to ensure safe hospitalization at home. We compiled relevant information from the scientific literature on HaH approaches and studies and conducted a web search. Our results indicate that healthcare professionals are trained in short training sessions, covering specific skills needed in the HaH context. These skills comprise, among others, communication, medication safety, infection control, and wound care. Patients and their families receive training in recognizing symptoms of deterioration and self-care. Concrete guidelines or standardized training programs are still missing. Future research should thus focus on developing standardized HaH training protocols and programs for both staff and patients to ensure patient safety at home.

Keywords. Hospital at home, education, clinical competence, professional competence, delivery of health care, home care services

1. Introduction

According to Public Health Scotland, Hospital at Home (HaH, also home hospitalization) is a care model in which a patient is treated "in their own bed rather than occupying a hospital bed and is managed by a dedicated team with clear lines of clinical responsibility identified. The activity would otherwise be delivered in a hospital setting" [1]. HaH is an example of home-based care models, of which HaH shows the highest involvement of professionals as well as shortest timeframe of care (days to weeks) [2]. HaH requires specialized multidisciplinary teams trained to provide acute care to patients at home. Fueled by recent technological progress and the COVID pandemic [3], HaH received increased interest, although implementation of HaH programs is still hindered. One challenge is that specific training is required for members of the HaH multidisciplinary team, specifically for HaH treatment protocols, along with patient and family caregiver

[1] Corresponding Author: Kerstin Denecke, Institute for Patient-centered Digital Health, Bern University of Applied Sciences, Biel/Bienne, Switzerland; E-Mail: kerstin.denecke@bfh.ch.

education [4]. Several research groups and organizations identified training and education as important factors of the current research agenda for HaH care [2,5]. Chen et al. concluded in a mixed-methods study on the impact of HaH that "patients' and carers' knowledge, skills, and confidence in disease management and self-care should be strengthened with a sense of safety during HaH treatment" [6]. Currently, there is no evidence on the content and organization of HaH-related formal and informal training programs. The objective of this paper is thus to consolidate the information on HaH-related education and training to inform the development of standardized curriculums which ensure a safe treatment at home.

2. Methods

This paper attempts to answer the question of what educational content and training is provided to HaH care teams, patients and informal care givers, for what purpose and how. To collect this information, we conducted a non-systematic web search we and extracted relevant information from scientific papers. The web search aimed at identifying content on training programs. We therefore carried out a Google search using the search term 'hospital at home OR hospital in the home AND training OR education OR master program'. Additionally, we based the information extraction on a previously conducted literature review that discusses the strengths, weaknesses, opportunities and threats associated with HaH [7]. The search was limited to PubMed®, known for its specialization in health-related content. We created a search string to capture relevant studies, including terms such as 'hospital@home', 'hospital at home', 'home care' and 'patient at home'. The included articles were published between 2013 and 2022. A detailed search methodology can be found in the review paper [7]. Of the 1371 articles initially retrieved, 82 were selected for full-text review and 42 of these were included in the qualitative synthesis. Out of these 42 papers, the authors manually extracted mentions related to training and education as well as qualifications of the people involved.

3. Results

3.1. Web Search

As a result of the web search, we identified 11 relevant sources of information, which we categorized as guidelines and resources or study programs and courses. They are described in detail below and the list of the sources is available via OSF (10.17605/OSF.IO/5PWKG).

3.1.1. Guidelines and Resources

In Australia, at least three out of six states (New South Wales, Queensland, Victoria) provide guidelines for implementation of HaH programs. The guidelines require training of staff in recognizing signs of deterioration in patients, in communicating, in assisting in clinical care (e.g. administering continuous intravenous antibiotics) and administering medication including medication safety. Additionally, staff training in tools, documentation and data entry is recommended. Patients and caregivers should be

educated and provided with written information in recognizing symptoms of deterioration.

The most comprehensive specification of skills and competencies we found is provided by the NHS Education for Scotland's "Knowledge and skills development framework for healthcare support workers, nurses and allied health professionals". The defined skills can be grouped into clinical skills, communication skills, technology skills, leadership and management skills, critical thinking and decision-making skills and legal and ethical skills. The "guiding principles for HaH service development" provided by Healthcare Improvement Scotland are basically referring to the skills framework described before. Mount Sinai Health System, the largest hospital network in New York City, provides both an internal implementation manual targeting HaH and rehabilitation at home. This manual mentions that nurses that will support HaH care are specifically trained in wound care, medication reconciliation, documentation and specific responsibilities. An overview on these documents is provided in Table 1.

Table 1. Identified guidelines and frameworks for HaH with information on training

Name	Country	Year
Guideline New South Wales	Australia	2018
Guideline Victoria	Australia	2011
Guideline Queensland	Australia	2023
Knowledge and skills framework by NHS	Scotland	2023
Principles Healthcare Improvement	Scotland	2020
Mount Sinai Guideline	USA	2018

3.1.2. Study Programs and Courses

Formal study programs for HaH are still limited. University of Barcelona offers a Master program specifically for HaH. The two-year program aims at providing health professionals with specialized knowledge and skills for delivering HaH care. TECH Technological university offers three HaH-related programs: A professional Master's degree in Home Hospitalization (online, 1500 hours), a professional Master's degree in Nursing Home Hospitalization (online, 1500 hours) and a practical training program in Home Hospitalization (performed in one of three participating healthcare institutions in Spain for three weeks). The Home Hospitalization Master program introduces the general process in home hospitalization, provides an understanding of organizational and management models, quality and safety indicators. It offers theoretical foundations and practical skills in managing acute medical conditions at home. Beyond, information on the peculiarities of home hospitalization for specific populations (mental health, palliative care, pediatrics) are delivered. According to Forbes Paraguay, this institution is currently the largest online university and officially recognized in Spain, Andorra, Mexico, Colombia, Peru, Costa Rica, and Venezuela [8].

Some additional study programs are not directly targeting HaH, but teach relevant aspects, for example the Master of Science in Health Delivery Science offered by Cedars-Sinai, the Master of Applied Science (MAS) in Patient Safety and Healthcare Quality offered by John Hopkins University and the Master of Healthcare Delivery Science offered by the University of Nebraska. Mayo Clinic offers a non-academic, one-hour, self-paced online course called "Essentials to Creating an Acute Hospital Care at Home Program" designed to learn more about the HaH program at Mayo Clinic.

3.2. Literature Review

In 23 out of 42 papers we identified information on education, training or skills needed or delivered within a HaH model (see the data extraction table available at DOI 10.17605/OSF.IO/5PWKG). The results are summarized in Table 2. The training efforts for patients and informal caregivers aimed at preparing them for discharge to home and ensure patient safety at home. Training for healthcare professionals aimed at preparing them for the specific HaH processes and specific tasks to ensure compliance with hospital care.

Table 2. Training within HaH care implementations, numbers indicate the number of papers that delivered corresponding information

Person group	Content	Content delivery
Patient (10/23) and informal caregivers (9/23)	Use and maintenance of a specific medical device (e.g. online platform, stoma etc.), Identification of disease-specific symptoms, required procedures or treatment, practical training, education regarding the illness and self-care	Practical training, provision of audiovisual materials or written documentation delivered by nurses, nurse practitioners o physicians, technical tools introduced by technical staff
Nurses (6/23)	Trained in post-operation care at home, home medicine or in the specific processes (e.g. home visits) and devices, collaboration, assessment and triage	Training delivered online, in person or through job shadowing and with a duration of a half up to several days
Physicians (1/23)	Trained in community paramedics capabilities and workflows	Not specified
General practitioners (1/23)	Trained in basic HaH services	Not specified
Paramedics (1/23)	Trained in physician tasks, e.g. home-based primary care, geriatrics, physical examination, blood glucose monitoring, medication administration	Didactic training and physician observation
Entire professional team (3/23)	Specific HaH processes	Trained by supportive care documents, guidelines and forms to ensure safe execution of treatment and consistency of care delivery

4. Discussion and Conclusions

Overall, education and training efforts related to HaH are rarely described in the included sources of evidence. The information extracted from the research papers correspond to the content of the identified guidelines. However, none of the research papers referred to a guideline or standardized framework. The skills in which healthcare professionals are trained are specific for the care delivery process in a HaH environment, or at least more relevant in this context. The knowledge and skills development framework by NHS has been identified as the first approach to standardize the skills needed within HaH. The identified master programs are very comprehensive and cover the different facets of HaH including practical skills. While the university of Barcelona is an accredited institution, the online university TECH is not yet recognized in Europe and can therefore not be considered as trustworthy. Information on HaH skills, training and education is concentrated in selected countries such as Scotland, USA and Australia. The master program has been developed in Spain. We thus conclude that HaH is not yet present

globally in higher education programs. This might be because healthcare-related education is still lacking aspects of interprofessional collaboration, e.g. between physicians, nurses and other medical personnel. While interprofessional education faces various challenges according to Bogossian et al. [9], it might be a key factor for providing successful HaH care as shown in the different workforce categories that are addressed in the identified guidelines. Although conducted carefully, our web search is limited as only Google was used as a search engine with a single search query, which was then manually augmented. Therefore, we recommend a more extensive web search for existing guidelines and educational programs in future work. As the literature review does not cover sources of evidence published after 2022, this paper might lack recent developments in the domain of HaH education.

Training and education of healthcare professionals, patients and their informal caregivers is an essential aspect of HaH care. Although recommended in guidelines, concrete implementation guides are missing and a first skills framework was only published in 2023. From the results we can conclude that health professionals involved in HaH care should be at least educated in the peculiarities of communication in this setting, medication safety, infection control, and wound care. Patients and their families should receive training in recognizing symptoms of deterioration and self-care . With an increasing percentage of home hospitalization, the necessity arises to move from ad hoc developed training to standardized programs to ensure that relevant knowledge and practices are available to the involved staff. Our research showed that there is only limited information on patient training in the HaH context. While training of involved professions is important, patient education should not be neglected as shown by Abril-Jiménez [10]. Future work should target at developing standards for patient training in this context to ensure patient safety in HaH contexts.

References

[1] Public Health Scotland. Data Dictionary [website]: Hospital at home; 2019 [cited 2024 June 4]. Available from: https://publichealthscotland.scot/services/national-data-catalogue/data-dictionary/search-the-data-dictionary/hospital-at-home/.

[2] Miller RK, Morgan-Gouveia MD, DeCherrie LV. Medical Training in Home Care Medicine: The Time is Now. J Gen Intern Med. 2022 Jul;37(9):2302-2305. doi: 10.1007/s11606-022-07514-4.

[3] Pandit JA, Pawelek JB, Leff B, Topol EJ. The hospital at home in the USA: current status and future prospects. NPJ Digit Med. 2024 Feb 27;7(1):48. doi: 10.1038/s41746-024-01040-9.

[4] Patel HY, West DJ Jr. Hospital at Home: An Evolving Model for Comprehensive Healthcare. Glob J Qual Saf Healthc. 2021 Sep 14;4(4):141-146. doi: 10.36401/JQSH-21-4.

[5] Leff B, DeCherrie LV, Montalto M, Levine DM. A research agenda for hospital at home. J Am Geriatr Soc. 2022 Apr;70(4):1060-1069. doi: 10.1111/jgs.17715.

[6] Chen H, et al. An integrated understanding of the impact of hospital at home: a mixed-methods study to articulate and test a programme theory, BMC Health Serv Res. 2024; 24:163. doi:10.1186/s12913-024-10619-7

[7] Denecke K, May R, Borycki EM, and Kushniruk AW. Digital health as an enabler for hospital@home: A rising trend or just a vision?, Front Public Health. 2023;11:1137798.doi: 10.3389/fpubh.2023.1137798

[8] Forbes Paraguay. TECH University [website]. The World's Best Online University; 2024 [cited 2024 June 12]. Available from: https://www.forbes.com.py/innovacion/tech-university-the-worlds-best-online-university-n53488.

[9] Bogossian F, et al. The implementation of interprofessional education: a scoping review, Adv in Health Sci Educ. 2023;28: 243–277. doi: 10.1007/s10459-022-10128-4.

[10] Abril-Jiménez P, et al. Developing modular training components to support home hospital digital solutions: Results of a Delphi panel, International Journal of Medical Informatics. 2022; 158:104655. doi: 10.1016/j.ijmedinf.2021.104655.