Learning Health Systems in Rehabilitation: Key Findings and Recommendations from a Scoping Review

Zsofia Torok[1,2], Áine Trayer[1,2], Lauren Christophers[1], Tom Rafter[1], Clare Hudson[2], George Hong[1,2], Áine Carroll[1,2]

[1] School of Medicine, University College Dublin, Ireland
[2] National Rehabilitation University Hospital, Dublin, Ireland

Introduction

Learning health systems (LHS) aim to generate and apply evidence, innovation, and quality to improve healthcare provision. By leveraging technology and data-driven strategies, organizations can improve care coordination, efficiency, and effectiveness. Implementing the LHS approach promotes integrated and patient-centered healthcare delivery, leading to improved outcomes, increased efficiency, and enhanced care quality across the continuum of care. Although extensively studied in acute healthcare settings, the application of LHS in non-acute healthcare settings remains relatively unexplored.

Aims and objectives

The aim of this scoping review was to systematically summarise the literature conceptualising and operationalising LHS and Learning Organisations (LO) in rehabilitation settings.

Research Question: How have Learning Health Systems and Learning Organisations been conceptualised and operationalised in the field of rehabilitation?

Objectives:
1. To gather and note the prevalence of literature which applies LHS and LO concepts to the rehabilitation context
2. To collate and synthesise different definitions of learning healthcare organisations and systems
3. To record how LO or LHS frameworks were applied in rehabilitation settings and the changes made within the organisation

Methods

Followed frameworks
JBI Peters[1], Levac[2], Arksey and O'Malley[3], PRISMA-ScR guidelines[4]

Literature search
OVID MEDLINE, EMBASE, CINAHL Nursing and Allied Health (CINAHL Plus), APA PsycINFO, COCHRANE Database of Systematic Reviews
+ grey literature (Lenus, greynet.org), rehabilitation datahubs and reference lists

Inclusion & exclusion criteria

Included	Excluded
Studies that:	Studies that:
Explicitly define a learning healthcare system or learning organisation (LHS/LO) OR Describe or outline an example of a LHS/LO AND Are conducted within or specify relevance to rehabilitation context	Report no definition, outline or result from a LHS/LO Are not relevant to rehabilitation context Not in English Poster abstracts Full text not available Animal study

Data extraction areas
- Demographic and descriptive study-related information
- Organisational setting of the applied LHS or LO frameworks
- Involved professionals
- Information about patient inclusion
- Definitions of LHS or LO concepts
- Key characteristics of LO or LHS framework
- Applications of LO or LHS frameworks in rehabilitation settings
- Impact of these applications on the implementing organizations

Results

Of initial 407 records, 82 full texts were screened, and 27 were included in the analysis (Fig. 1).

Figure 1. PRISMA flow chart

Results

Objective 1.
22 publications (81.5%) discussed or applied the concept of the LHS, while 5 (18.5%) used the concept of the LO.
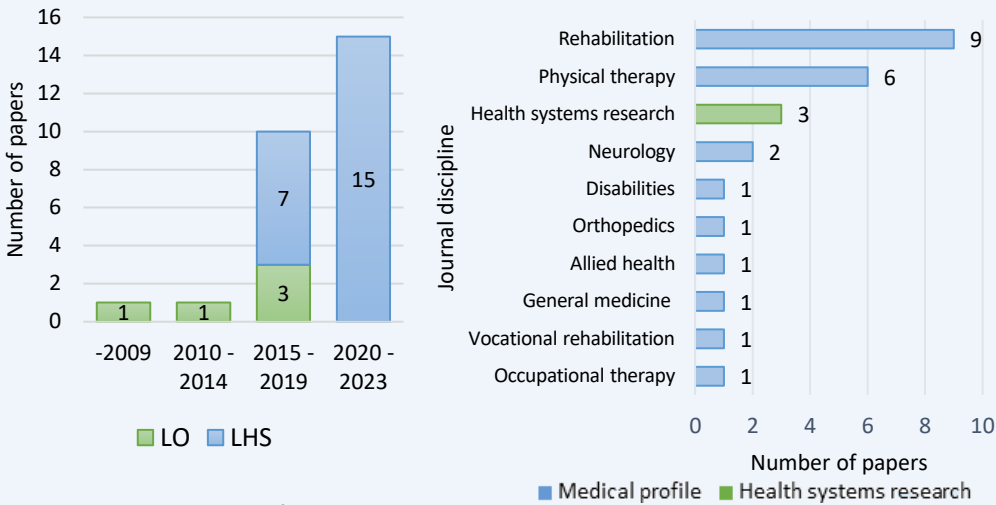

Figure 2. Date of publication

Figure 3. Journal discipline distribution

Objective 2.
Studies conceptualised LHS in rehabilitation as organizational infrastructure that supports continuous learning by integrating clinical care and research. It aims to generate new knowledge by capturing data from every clinical encounter and applying it to practice through iterative learning cycles, characterized by three phases: Data to Knowledge (D2K), Knowledge to Performance (K2P), and Performance to Data (P2D) (Fig. 4)
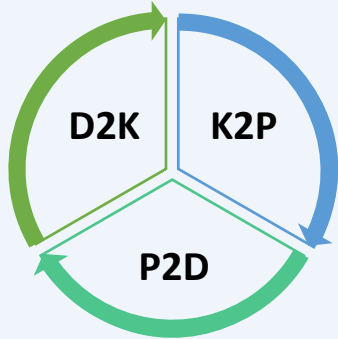

Figure 4. Learning cycle

Objective 3.
Four key themes emerged regarding the operationalization of LHS in rehabilitation: creating a functioning data infrastructure; ensuring the quality of collected data; the importance of assembling a multidisciplinary team and the institutional characteristics, strategies and actions necessary to establish and operate a successful LHS.

| Creating a functioning data infrastructure	• Database development • Ensuring data quality and validation • Implementing data sharing and security measures • Accommodating stakeholders' preferences and needs • Integration with clinical practice
Quality of collected data	• Incorporation of relevant data • Details regarding data collection and input • Discrete data collection • Standardized outcome measures and terminology
Assembling a multidisciplinary team	• Diverse skillsets and expertise • Teams including key clinical stakeholders, IT experts and managerial, administrative & staff training personnel • Collaboration and cooperation • Involvement of patients and families
Institutional strategies and characteristics	• Effective communication • Minimising healthcare fragmentation • Compliance and accountability • Clinician engagement and education • Regular monitoring and audits • Designated oversight and responsibility • Institutional training and standardization
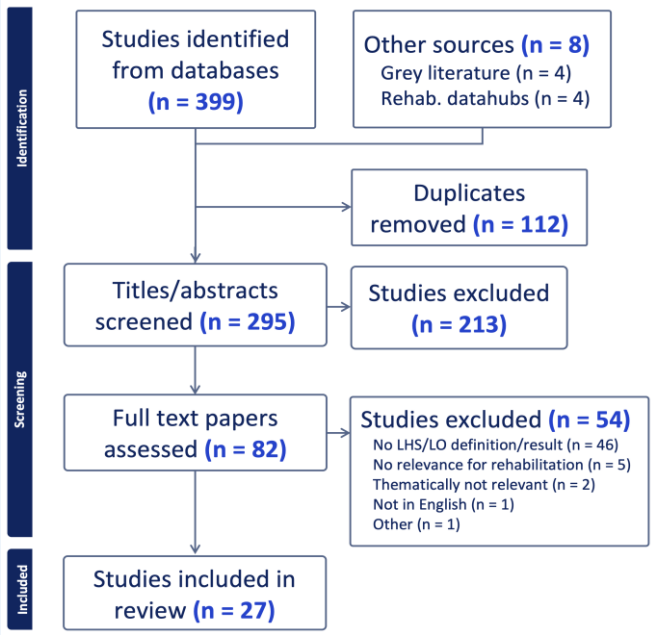
Discussion

This study presents the first scoping review of learning health systems and learning organisations within the rehabilitation context. Employing a systematic and rigorous process to capture the relevant literature, it identified multiple areas that need to be addressed to transform an organization into a LHS.

Recommendations for advancing the transformation of healthcare organizations into LHSs include conducting further research to explore specific aspects of implementation, such as data governance frameworks and stakeholder engagement strategies. Organizations should develop comprehensive implementation plans tailored to their unique needs and contexts, integrating LHS principles and practices effectively. This integrated approach fosters a holistic and patient-centered approach to healthcare delivery, promoting improved outcomes and facilitating continuous learning and innovation within the healthcare system.

References
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Contact: George.Hong@nrh.ie
@INSPIRE_NRH