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Literature Review

Exploring the importance of daily weights for patients diagnosed with congestive heart failure: A review of the literature

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Key Words: congestive heart failure; daily weights; barriers; re-admissions; diuretic; decongestion; medication titration; nursing care;

Abstract

Aim: The importance of recording the daily weight of hospital in-patients suffering with congestive heart failure is reinforced in the European Society of Cardiology and NICE (2021) guidelines, yet inconsistencies in nursing care remain in the United Kingdom. Identifying the reasons and barriers for inconsistency is important to promote optimal fluid management and up-titrating therapy.

Methods: A review of the literature using the electronic database CINAHL Ultimate searched for research studies between 2013 and 2024, and from n=505 research studies, n=62 were reduced and n=11 appraised. **Findings:** Three themes were found: first, recording congestive heart failure patients' daily weights correlates to the effectiveness of congestive heart failure decongestion because it is a biomarker or measurable indicator to inform diuretic protocols and accurately titrate diuretics.

Second, barriers and obstacles in obtaining daily weights relate to training and knowledge, poor task delegation and insufficient or broken equipment. Third, daily weighing and optimal fluid management reduces 30-day re-admissions, attendance at an emergency department and improved mortality rates. **Conclusion:** The recording of a patient's daily weight enables nurses to determine accumulated fluid retention, inform a multi-disciplinary treatment response, predict mortality, accurately titrate medications, and reduce 30-day re-admissions.

Introduction

Loop diuretics are recommended to reduce the signs and symptoms of congestion for patients diagnosed with heart failure (McDonagh et al., 2021). NICE (2021) recommend closely monitoring a patient's renal function, weight and urinary output during diuretic therapy. To improve treatment efficacy and organ function, the Europe-

an Society of Cardiology [ESC] (McDonagh et al., 2021) recommend training patients with heart failure to self-adjust their diuretic dose and monitor their daily weight for signs and symptoms of decongestion (removal of retained fluids). In hospital, daily weighing (DW) of patients is performed by nurses or other healthcare staff in the National Health Service [NHS], but inconsistencies have been found to impact on diuretic therapy (Javaid et al., 2017; Khan & Khan, 2022). Following cases in cardiology and non-cardiology wards leading to prolonged inpatient stay and even death for chronic heart failure (CHF) patients, poor optimum fluid management and up-titrating therapy was associated with not following ESC guidelines (Javaid et al., 2017) or NICE guidelines (Khan & Khan, 2022). A review of the literature was conducted to search for evidence of CHF inpatient nursing management and DW.

Mortality rates and hospital admission

Coronary heart disease (CHD) affects the heart or arteries (clogged arteries) which can lead to a heart attack, heart failure, atrial fibrillation, stroke and vascular dementia (BHF, 2025; OHID, 2024). With 7.6 million people living with CHD in the UK, 1,862,500 having a GP diagnoses of CHD in England, the number has decreased by half since 2010 (OHID, 2024). The hospital admission rate for CHD decreased by 46% over the last twenty years (2003 to 2023), yet despite the rate of mortality decreasing, the CHD mortality between 2019 and 2023 for patients under 75 years of age increased by 14.3% (OHID, 2024). There was also a 3.3-fold socio-economic difference in 2022 with 78.1 per 100,000 mortality rates in Blackpool and 23.9 per 100,000 in Richmond-Up-on-Thames (OHID, 2024). Admission rates for heart failure were noticeably higher than CHD, with a 3.5-fold difference between counties in England, the highest rate

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of 376.8 per 100,000 population in Sefton, compared to the lowest of 107.7 per 100,000 population in Rutland (OHID, 2024).

Heart failure and CHD

Often preceded by CHD, heart failure is an inability to pump blood around the body, and the most common cause of death in the UK (Blake, 2019). A reduced blood supply may lead to a patient suffering a heart attack (myocardial infarction). When the heart muscle is impaired, it causes an inadequate supply of oxygenated red blood cells to the kidneys, causing the kidneys to perform inadequately and fluid congestion builds up in the circulatory system, leading to heart failure (OHID, 2024). The kidneys produce erythropoietin, a hormone which alerts and prompts the body's bone marrow to produce more de-oxygenated red blood cells, which are then transported by capillaries to the heart (Pellicori et al., 2015). Red blood cells are oxygenated during the journey from the right ventricle, through the pulmonary artery to the lungs, returning to the heart through pulmonary veins to circulate oxygenated blood around the body (Pellicori et al., 2015).

Nationally, heart failure diagnosis may lead to CHF in patients with a history of myocardial infarction, arterial hypertension, diabetes mellitus, alcohol misuse and coronary artery disease (McDonagh et al. 2021). Heart failure may also lead to chronic kidney disease, cardiotoxic chemotherapy and a family history of sudden death (McDonagh et al. 2021). The onset of CHF can be acute (sudden and life-threatening), or an exacerbation of an existing heart failure, or chronic [progressive and ongoing] (NICE, 2021). CHF prevalence rapidly increases from the age of 65 (NICE, 2024) and initial physical indicators present such as breathlessness, fatigue, and peripheral oedema (usually present in ankles and legs). CHF is indicated if a patient suffers with oedema, due to kidneys receiving insufficient blood supply from the heart, the body retains fluids causing the kidneys to inadequately filter and excrete water and salts through urea production (MacArthur, 2020). A diagnosis of CHF is formed through performing multiple blood tests (serum urea and electrolytes, creatinine, full blood count, liver and thyroid function, plasma concentrations of natriuretic peptides), a 12-lead electrocardiogram, chest x-ray and lung function tests (Evans, 2022; McDonagh et al. 2021). Notably, a patient's weight may increase by a minimum of 2 kilograms in two-days due to oedema (Kennelly et al., 2021).

Search strategy

A literature review exploring CHF inpatients and DW monitoring was conducted to understand the evidence-based nursing care. A PICO tool [population, intervention, comparison, outcome] (see table 1) was used to initiate a search of relevant research studies. The e-database CINAHL Ultimate was used between 2013 and 2024 with

search terms “congestive heart failure AND inpatients management AND daily weight change AND diuretics for heart failure AND inpatients or patient hospitalisation or hospital readmission or patient readmission.” A PRISMA (Stovold et al., 2014) flow diagram outlines the search methodology (see figure 1). The limiters selected were the abstract, research studies in English, full references available and peer reviewed (see table 2 entitled: *Inclusion and exclusion criteria*). The search retrieved n=505 research studies and after review, n=62 full texts were available, however n= 52 had inadequate discussion depth, resulting in n=11 studies found to be eligible for critical appraisal (see table 3 entitled: *Table of findings*) (Ali et al., 2013; Barsuk et al., 2013; Cockayne et al., 2014; Davies et al., 2019; Khan and Khan, 2022; Kociol et al., 2013; Rasoul et al., 2024; Reid, 2022; Turrise et al., 2023; Vinck et al., 2022; Wood et al., 2019).

Table 1: PICO Tool

PICO	Key term
Population	Heart failure hospital patients
Intervention	Tools used to weigh patients with HF daily
Comparison	Risks associated with not weighing heart failure inpatients daily requiring diuretics
Outcome	Reducing readmissions and hospital stay

Literature review

A CASP (Critical Appraisal Skills Programme) framework was applied to the research studies to identify key issues (Long et al., 2020). The hierarchy of evidence pyramid by Glover et al. (2006) was used to determine critical issues of quantitative research studies and the hierarchy of evidence pyramid by Daly et al. (2007) applied to qualitative research studies. Although each key paper used different research methodologies such as quantitative and qualitative approaches, similarities were apparent. Each research study attempted to raise awareness about symptom management and DW in relation to HF/CHF.

The case-based discussion study by Ali et al. (2021) was formed from reliable, randomised data, issuing guidance and investigating current approaches for monitoring diuretic efficacy in patients in Switzerland. The study examines diuretic dosing, observational approaches, contraindication prospects, the use of additional medications to maximise effectivity, reviewing drug route modifications, and complete discontinuation. A detailed timeline of diuretic treatment paths and usual challenges were provided and acknowledged DW role when considering diuretic treatment and CHF decongestion. In contrast, Barsuk et al. (2013) completed an observational medical records review to compare a nurse driven diuretic (n=68) dosing protocol with usual diuretic dosing (n=528) for patients admitted with acute decompensated HF. The protocol enabled nurses to accurately titrate diuretics in accordance with hourly urine-output, improved com-

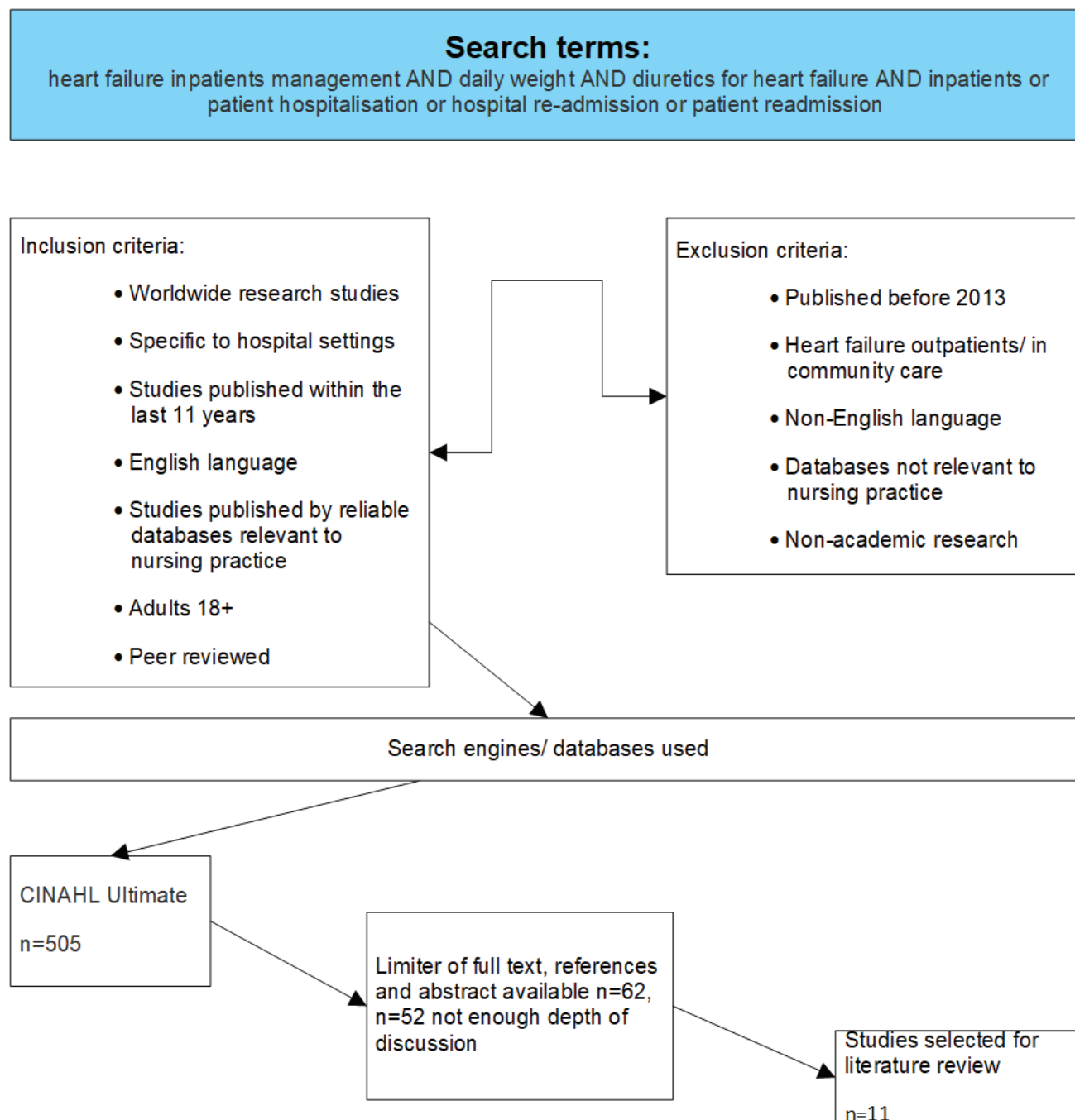


Figure 1: PRISMA diagram outlining the search strategy

munication between physicians and nurses and monitor electrolyte balances twice daily to ensure avoidance of detrimental diuresis. The diuretic protocol was found to promote weight loss, reduce re-admission without impacting mortality rates, and DW were found to be crucial in these aims.

Cockayne et al. (2014) focused on reducing re-admissions/admissions to hospital for patients managing CHF for any reason within a 12-month period. Their methodology used a practical, open parallel random controlled trial to compare a cognitive behavioural self-management manual delivered by specialist HF nurses or the same programme followed by the patient on their own. Of the n=260 patients reviewed, findings concluded there was no evidence of difference between groups, whether or not a patient was re-admitted to hospital during the

12-month follow-up. Secondary outcomes were to improve self-measured quality of life, and reduce anxiety and depression. The systematic review of 13 global cohort studies by Davies et al. (2019) compared whether daily fluid balance documentation was more dependable than evaluating a patient's DW, to accurately titrate fluid treatment for patients with acute kidney injury/ heart failure/ acute lung injury in intensive care units. They concluded DW was a dependable parameter to gauge titration and if consistently measured, enhancing patient-centred care.

Khan and Khan's (2022) retrospective analysis on their busy acute heart failure ward identified that DW for CHF patients, even if prescribed to monitor the efficacy of diuretic treatment of fluid retention causing dyspnoea and peripheral oedema, were not always recorded consist-

ently despite NICE and local guidelines. $n=55$ patients records ($n=32$ met the inclusion criteria), and only 46% of DW were recorded on admission days but prescribed DW was 83% and so being prescribed was associated with higher documentation rates. Khan and Khan (2022) concluded that DW are not always prioritised due to busy workloads, and can be missed during ward handovers, but prescribing DW functioned as an automatic reminder for healthcare staff to measure and monitor this biomarker for diuretic dosage and effect.

Table 2: Inclusion/exclusion criteria

Inclusion:	Exclusion:
Worldwide research studies	HF outpatients/ in community care
Specific to hospital settings/ inpatients	Non-English language
Studies published 2013-2024	Non-academic research
Published by reliable databases	
relevant to nursing practice	
Age range=18+	
Peer reviewed	
Registered nurses (RNs)	
UK and Ireland	

The study by Kociol et al. (2013) employed a retrospective analysis based on a randomised clinical trial involving $n=308$ patients with an acute decompensated heart failure, primary diagnosis and existing CHF, within 26 United States hospitals, across 21-months. The study aimed to determine the connection between decongestion indicators; weight change, fluid loss, and their influence on alleviating symptoms, reducing re-hospitalisation, admission to an emergency department or death. Results revealed each indicator had a weak correlation with dyspnoea relief. Weight change and fluid loss was assessed via DW confirmed an improvement in weight loss, and DW monitoring was associated with a reduced mortality rate and improved 60-day clinical outcomes (not requiring an emergency department admission or re-hospitalisation). Reid (2022) performed focused interviews with staff, to explore and address barriers interfering with obtaining DW from heart failure from inpatients in a 176-bed community hospital in Jersey. Within 12-months, compliance improved from 36% to 85%, with an overall 161% performance increase between January 2018 and March 2021. The overall aim was achieved, and a plan was formulated to make successful improvements. Reid (2022) recommended daily DW documentation reviews to maintain task success.

The qualitative study by Turrise et al. (2023) of patients' experiences and perceptions of controlling their heart failure, self-care and illness control following re-hospitalisation. A purposive sampling strategy identified $n=10$ patients aged 53 to 90, from an inpatient telemetry unit within a trauma hospital in North Carolina. Using a thematic analysis of interview transcripts two themes were identified; strategies used to control HF and barriers to

control. The first theme included managing fluid intake and medications, self-advocacy, monitoring and support. Barriers to control were found to be healthcare systems, healthcare professional relationships and interactions, personal characteristics and knowledge deficit.

The study by Wood et al. (2019) discussed strategies to reduce re-admission for patients suffering with HF and concluded stakeholder and multi-disciplinary collaboration, shared learning to promote consistency and patient education on the need for DW. The study reinforced the need to educate patients on sodium reduction, diet, exercise, symptom management, contact numbers and follow up appointments. The analysis by Rasoul et al. (2024) of a virtual ward, or "hospital at home" called the Liverpool HF virtual ward, fits in very well with the NHS (2024) directive for more care at home for acute patients who otherwise may be admitted to hospital. The virtual ward offered $n=648$ patients remote monitoring, investigations, and treatment at home under the supervision of a consultant cardiologist and specialist nurses. Equipment for suitable patients included remote electronic wearable devices, a pulsometer for oxygen saturations three times a day, a single lead electro-cardiogram, a step count, blood pressure monitors and weighing scales for DW. Patients also received daily calls from the nurses and face-to-face contact for intravenous drug therapy. Fast track measures were in place for deteriorating patients. With an average occupancy of 88%, a net cost benefit of £1135 per person per event was found, a marked reduction in re-admissions to hospital, re-attendance at an emergency department and improved mortality rates over a year.

The study by Vinck et al. (2022) aimed to validate the predictive value of the European collaboration on acute decompensated heart failure (ELAN-HF) score for nurses to assess the impact of self-care behaviour to optimise follow-up treatment, decrease re-admission and mortality. The study identified $n=88$ participating patients, organised into four risk categories; very high, high, intermediate and low according to their ELAN-HF score, which was evaluated and compared to the original study identifying the scores development. Self-care behaviour was assessed by the European Heart Failure Self-care Behaviour Scale (EHFScBS-9) and between both scores and re-admission for HF analysed for all-cause mortality within 180 days. The conclusion would not have come as a surprise and the study confirmed the validity and potential of the ELAN-HF score to triage patients with acute decompensated HF before discharge from the nurse-led unit to optimise follow-up treatment, decrease re-admission and mortality.

Synthesis of findings

Whilst reviewing the key papers, it was evident each study aimed to educate/ raise awareness on HF/CHF and DW importance, with some promoting transferable strategies in ensuring DW are obtained. Multiple themes

Table 3: Table of findings

Author/ year	Aim of study	Methodology	Findings
Ali et al. (2013)	A practical review of latest diuretic strategies in the treatment of HF, review optimal initial diuretic	A review of loop diuretics to maintain a threshold was searched Case presentation	Understanding pharmacokinetics of select diuretic agents to achieve decongestion
Barsuk et al. (2013)	Comparison of diuretic dosing protocols vs usual diuretic therapy	Observational medical records review to compare use of a nurse-driven diuretic dosing protocol with usual diuretic dosing. n=596 patients records reviewed.	Protocol use not associated with significant differences in kidney failure, inpatient mortality, or 30-day mortality. May lower 30-day re-admission
Cockayne et al. (2014)	To compare a cognitive behavioural self-management manual delivered by specialist HF nurses or the same programme followed by the patient on their own, Related to readmissions/admissions to hospital for any reason within a 12-month period	Pragmatic, open parallel group, randomised controlled trial, n=260 patient	No evidence of difference between groups, whether or not a patient was re-admitted to hospital during the 12-month follow-up
Davies et al. (2019)	To synthesise the best available evidence on the accuracy of daily fluid balance charting compared with the measurement of body weight	Literature review between 1980 and 2018	n= 13 cohort studies. Daily fluid balance charting affected by inaccuracies Inability to obtain consecutive daily body weight measurements reduced the accuracy of monitoring changes. Measurement of daily fluid balance inconsistent with changes in body weight
Khan and Khan (2022)	Investigate how often daily weights are documented in Acute HF inpatients. Wanted to explore whether prescribing daily weights is associated with a higher documentation rate	A retrospective analysis (audit) of n= 55 inpatients referred to the AHF specialist team performed. Recorded the total length of stay in days and the number of daily weights documented.	n=32 patients met the criteria. On average, weights were recorded 46% of admission days. Prescribing 'daily weights' was associated with significantly higher documentation rates (83% vs 46%, p<0.05), however only 25% of patients had these prescribed Daily weights not always prioritised
Kociol et al. (2013)	Congestion is a primary driver of symptoms in and relief critical. Monitoring daily weights and net fluid loss is standard care, yet commonly used markers of decongestion and patient reported symptom relief/ clinical outcomes are unknown	A retrospective analysis of RCT, Diuretic Optimization Strategy Evaluation in Acute Heart Failure (DOSE-AHF)	Weight loss, fluid loss, and symptom relief at 72 hours are poorly correlated with dyspnoea relief
Reid (2022)	In 2018, a gap analysis revealed 36% of HF patients were weighed daily during hospitalisation	Focused interviews with team members to identify any barriers	Team members reported broken beds, beds not zeroed, lack of Supervision/ task delegation, lack of importance due to multiple tasks assigned simultaneously, and no formal process to perform weights Huddles, red heart signage, reporting of non-daily weights to nurse leader resulted in 85% compliance in 12 months. 163% increase
Rasoul et al. (2024)	Liverpool HF virtual ward, or hospital at home, reduce re admissions or attendance at accident and emergency departments, reduce cost	n=648 patients Virtual ward care vs traditional care. Analysis of cost and benefits. Patient set up, home monitoring, home visits, point of care testing, home intravenous drugs, assessment of emergency care attendance and re-admission, cost of team 6 months data collected, costs calculated 30 days from discharge, NICE (2022) early value assessment used for economic analysis, total cohort costs were extrapolated to a full year	With an average occupancy of 88%, The overall cost savings were a net cost benefit of £1135 per person per event, due to marked reduction in readmissions to hospital, re-attendance at an emergency department and improvement in mortality rates over a year

Author/year	Aim of study	Methodology	Findings
Turrisse et al. (2023)	To explore the experiences of people with HF in managing their illness, perceptions and illness control	A qualitative approach, thematic analysis applied to n=10 patients in semi-structured interviews n-Terminal pro-B-type natriuretic peptide (NT-proBNP) levels were measured on admission and discharge,	2 themes identified, 1/ strategies to control HF and 2/ barriers to controlling HF. 4 subthemes: managing dietary intake and medications; self- advocacy; monitoring symptoms; and support. Barriers to control had four subthemes: healthcare systems issues; health care professional relationships and interactions; personal characteristics; and knowledge deficits.
Vinck et al.(2022)	To validate the predictive value of ELAN-HF score, to assess the effect of self-care behaviour on readmission/ mortality in patients after admission with acute decompensated heart failure	Quantitative, prospective, single centre, cohort study. n=88 patients	Significant association between the ELAN-HF score to triage patients with HF before discharge and re-admission and/or mortality confirms the validity and potential of the ELAN-HF score to triage patients with HF before discharge
Wood et al. (2019)	strategies and considerations for nurses planning HF re-admission reduction initiatives	Analysis of strategies used, lessons learned from a framework- guided by two separate but similar HF reduction projects conducted in military and civilian healthcare facilities	Defined outcomes, multidisciplinary inclusivity, redundancy in roles, greater collaboration, and engagement with stakeholders most beneficial, dedicating resources continuously

emerged within the key papers, which effectively revealed potential capabilities and challenges:

- DW acting as a biomarker/indicator
- Barriers/obstacles in obtaining DW
- DW and CHF 30-day re-admission

DW acting as a 'biomarker/indicator'

DW are effective in managing decongestion because a patient's weight measures accumulated fluid in the body and functions as a mortality predictor in critically ill patients (McDonagh et al., 2021). Davies et al. (2019) highlight DW ability to determine CHF inpatients body fluid status, and management is reliant on DW being performed daily. Reid (2022) found that nurses rely on a patient's DW to ascertain treatment response and identify those who require medication or treatment reviews to inform the medical team. The importance of assessing a patient's self-reported symptoms such as fatigue, weakness, or pain, demonstrated a poor correlation between DW as a biomarker of decongestion, and dyspnoea relief (Kociol et al., 2013). Ali et al. (2021) and Barsuk et al. (2013) reinforce DW function as a biomarker for assessing treatment response, efficacy, enabling safe and accurate titration of medications. Kociol et al. (2013) however, caution DW use in isolation and should be used in conjunction with other non-invasive methods to assess indications of fluid overload (such as lung, inferior vena cava ultrasound, basic and advanced echocardiographic techniques, Patel et al. 2023). In contrast, Ali et al. (2021) suggests incorporating invasive methods, such as assessing right atrial and pulmonary capillary wedge pressures. However, Ali et al. (2021) identify limitations to urinary output and DW for acute HF and suggest a viable measure of an early diuretic efficacy is to monitor urinary sodium excretion because sodium homeostasis governs the amount of extracellular fluids. Low urine sodium concentration <50 to 70mEq/L implies inadequate natriuresis (excretion of sodium in the urine), while high sodium con-

centrate indicates an adequate diuretic response (Ali et al., 2021). Ali et al. (2021) however, do not suggest DW should not be obtained later on with CHF management.

The research study by Turrisse et al. (2019) aimed to understand how patients controlled their illness, and their perception of it following re-admission. They identified two themes: strategies to control CHF and barriers to control. Patients were aware of the need to perform DW, but were unsure what to do with that information, other than to inform the nurse. The conclusion was that the patient did not feel empowered, confident or informed about the correlation between weight, fluid retention and symptom management. There was a concern that if healthcare professionals had difficulty in controlling HF/ CHF then how were patients expected to control and understand their symptoms. In the research study by Vinck et al. (2022), notably located in a nurse- led HF clinic, using the European HF self-care behaviour scale (EH-FScBS-9), responding patients stated they did not weigh themselves daily. This finding indicated there was more work needed to be done in self-care education related to DW and communicating with the nurse or doctor. Despite an emphasis on self-care and psychological support, a focus on plasma markers to indicate severity of congestion by the researcher's found mortality, morbidity and optimal self-care led to 30% less re-admissions (Vinck et al., 2022).

Barriers in obtaining daily weights

A majority of the research studies identify barriers which interfere with successful measurement of DW for both HF and CHF inpatients (Barsuk et al., 2013; Davies et al., 2019; Reid, 2022; Khan & Khan, 2022; Kociol et al., 2013; Turrisse et al., 2019; Vinck et al., 2022). Feedback from focused interviews conducted by Reid (2022) highlight the existence of social and organisational barriers. Other barriers were inadequate leadership and staff in-

teraction and task delegation, with scarce guidance or policies accessible on how to perform DW, therefore causing other tasks to be prioritised. Reid (2022) recognised technological barriers such as broken beds and staff's inability to zero beds with inbuilt scales. Adjustments were suggested, such as staff receiving training on how to zero bed scales and training on DW rationale along with clinical guidelines regards weight changes requiring escalation, for example, five-pound weight gain/loss (Reid, 2022). In addition to the need for clinical guidance, improvements were noticed when modifying leadership styles, a patient's DW discussed during early morning handovers, and the DW task allocated to night staff to during specific hours (Reid, 2022). Compliance in obtaining DW drastically improved when using a red heart symbol situated by each patient's bedside as a reminder, and daily audits completed by the advanced nurse practitioner responsible for escalating care. Khan and Khan's (2022) retrospective audit of cardiology and non-cardiology wards found DW were often missed during admissions, and ward handovers and not prioritised until DW for CHF patients were prescribed to act as an automatic reminder. Once that happened DW increased to 83%.

The HF virtual ward (hospital at home) by Rasoul et al. (2024) identified the importance of a patient's ability to accurately weigh themselves and communicate their DW to staff monitoring remotely. The self-care and independence maintained by remaining at home and not having to rely on staff being available, was a key factor in its daily continuity and patients and their families were highly satisfied with this remotely monitored home based approach (Rasoul et al., 2024). Each solution and outcome discussed demonstrate transferable strategies in overcoming poor compliance in obtaining DW from CHF inpatients.

Davies et al. (2019) explored obstacles in collecting accurate DW measurements, stating weighing a patient in a sling or hoist is much easier. If a patient is bedbound and requires bed scales, additional items on the bed should be weighed separately if they could not be removed, for example telemetry boxes (leads must stay attached continuously) and deducted off the bed scale weight. However, this is not always possible, for example a patient may have a FemoStop (mechanical compression system applied to the femoral artery) located on their groin post angiogram which categorically could not be removed within a certain period. Davies et al. (2019) identified a further obstacle which Kociol et al. (2013) supported; failure to consistently use the exact same calibrated scales can cause a discrepancy in establishing accurate results. Kociol et al. (2013) however argued inaccuracy was due to inconsistency in the time patients are weighed and clinicians should ensure patients were consistently weighed at the same time, after their first void that day, and before they have eaten.

Turrisi et al. (2023) identified four sub themes to control HF symptoms; healthcare system issues; health care professional relationships and interactions; personal characteristics; and knowledge deficits. However, the study by Vinck et al. (2022) on the effectiveness of the European CHF self-care behaviours scale concluded self-care behaviour is not significantly associated with re-admission or mortality, which is an interesting conclusion because they identified 5/6 patients did not weigh themselves daily or informed a nurse or doctor if their weight increased by 2kg in 7 days, indicating inconsistency of self-care behaviours.

DW and CHF 30-day readmissions

The hospital at home initiative by Rasoul et al. (2024) proved to be beneficial with a marked reduction in re-admissions, attendance at an emergency department and improved mortality rates, with DW being one of many monitoring measure methods to indicate CHF stability. The study by Barsuk et al. (2013) suggested the introduction of a diuretic protocol had potential to improve CHF symptoms and reduce 30-day re-admissions, despite extended admission periods for clinicians to monitor patients' diuretic response before discharge. A key point in assessing diuretic response within the protocol required nurses and patients to collect DW and measure urinary output.

In Barsuk et al. (2013), the study found CHF inpatients with prolonged hospital admissions had a positive correlation with a reduced 30-day re-admission risk. Therefore, proving the use of guided treatment interventions can positively impact weight and reduce re-admission. Barsuk et al. (2013) findings highlight DW can be a positive factor when assessing when a patient is sufficiently stable enough to be discharged. However, the study focused predominantly on results from women. However, according to Tipton et al. (2016) findings would be less dependable due to the small sample size (n=68) reducing validity, pertinence, and population representation. Ali et al. (2021) argued the definitive factor in reducing 30-day re-admissions as opposed to DW, is increased diuretic dosages compared to dosing prescribed during and prior to admission.

Conclusion

This literature review was initiated due to cases observed in cardiology and non-cardiology wards by Khan and Khan (2022) and Javaid et al. (2017) of CHF patients not having optimum fluid management, DW and up-titrating therapy leading to delayed inpatient stay and even death. ESC (McDonagh et al., (2021) and NICE (2021) guidelines reinforcing measuring urinary output and monitor CHF diuretic efficacy, were also not followed. We identified three themes related to improving CHF care and management; first, DW acts as a bio marker of decongestion and dyspnoea relief for the efficacy of diuretic drug administration. Second, barriers to obtaining DW

were environmental (Rasoul et al., 2024), dependant on nursing leadership styles, handover opportunities (Reid, 2022) and poor staff training (Davies et al, 2019). The use of bed scales, sling or hoist (Davies et al., 2019), bedbound or mobile patients (Reid, 2022), and poor communication within multi-disciplinary teams were also barriers (Reid, 2022). Third, DW and CHF 30-day re-admissions (Woods et al., 2019) and successful hospital at home evaluations (Rasoul et al., 2024), found the need to develop stakeholder and multi-disciplinary collaboration. They also found that shared learning and patient education and following ESC (McDonagh et al., 2021) and NICE (2021) guidelines resulted in reduced admissions to hospital, greater patient and family quality of life and improved mortality rates (Rasoul et al., 2024).

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