

Article

Not peer-reviewed version

---

# Navigating Expert Opinions on Best Practices During Manual Handling for Patient Positioning in Long-Term Care Settings

---

[Stephen Sunday Ede](#) , [Jonathan Sinclair](#) , [Jess Macbeth](#) , Matthew Dickinson , [Ambreen Chohan](#) \*

Posted Date: 17 February 2026

doi: 10.20944/preprints202602.1280.v1

Keywords: occupational health; patient safety; patient manual handling; repositioning; single-handed care; work-related musculoskeletal disorders



Preprints.org is a free multidisciplinary platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This open access article is published under a [Creative Commons CC BY 4.0 license](#), which permit the free download, distribution, and reuse, provided that the author and preprint are cited in any reuse.

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

Article

# Navigating Expert Opinions on Best Practices During Manual Handling for Patient Positioning in Long-Term Care Settings

Stephen Sunday Ede <sup>1,2</sup>, Jonathan Sinclair <sup>1,2</sup>, Jessica Macbeth <sup>1,2</sup>, Matthew Dickinson <sup>3</sup> and Ambreen Chohan <sup>1,2,\*</sup>

<sup>1</sup> School of Health, Social Work, and Sports, University of Lancashire, Preston, United Kingdom

<sup>2</sup> Research Centre of Applied Sports and Physical Activity, University of Lancashire, Preston, United Kingdom

<sup>3</sup> Vikings Exos, Lancashire, United Kingdom

\* Correspondence: AChohan@Lancashire.ac.uk; Tel: +44 (0) 1772 892 793

## Abstract

Patient manual handling during positioning is widely recognised to have low evidence-based practices, which exposes healthcare practitioners (HCPs) to a high risk of work-related musculoskeletal disorders (WRMSDs). This study assessed experts' opinions regarding challenges and best practices during manual handling for patient positioning in long-term care settings. A semi-structured interview was conducted with purposively recruited subject experts in the UK (n=9; aged 30-62 years). Interviews focused on challenges in patient manual handling, experts' ideas about best practices, and suggested solutions to persistent challenges, and data were analysed thematically. Major gaps in training and in key aspects of positioning were evident, including patient bed mobility, postural management, and turning patients into side-lying. Experts asserted that realistic and comprehensive training structured on optimised use of low-tech equipment such as wedges, breathable pillows, sliding systems, and sleep systems may be more effectively implemented for safer patient handling, even for single-handed care settings. This study provided a novel model and recommendations to optimise practices in patient bed mobility, posture care, repositioning and turning into side-lying, aimed at improving patient outcomes and mitigating occupational risks.

**Keywords:** occupational health; patient safety; patient manual handling; repositioning; single-handed care; work-related musculoskeletal disorders

---

## 1. Introduction

Poor manual handling techniques account for up to 30% of all work-related accidents in the UK, with approximately 11% of these incidents occurring in health and social care settings [1,2]. Unsafe manual handling practices continue to persist in UK healthcare and are associated with substantial costs [3], including millions of pounds in compensation claims and significant impacts on sickness absence, productivity loss, and healthcare expenditure [4,5]. For example, NHS Resolution data indicates that settled manual handling claims resulted in payouts exceeding £57 million between 2009 and 2019, highlighting the rising financial burden of these incidents [6]. While quantitative survey studies have attempted to explore factors and prevalence of patient manual handling injury risks [7–9], these were based on the use of risk assessment checklists such as the Movement and Assistance of Hospitalised Patients and the Patient Transfer Assessment Instrument. These checklists, however, show poor focus on patient handling for bed-positioning and are limited by the content and context of their design, so may not reflect the multi-factorial, evolving nature of patient-handling risks across settings. For this reason, qualitative methods may offer a more nuanced, richer insight [10].

Few qualitative studies [11,12] have attempted to explore patient manual handling. Existing research has been carried out among hospital-based staff, rather than in community settings or among patients. For instance, Stucke and Menzel's [12] focus group study among nurses highlighted some manual handling risks, including obesity, dependence, resistant behaviour from the patient, frequent turning and repositioning, inadequate staffing, a lack of appropriate handling equipment, as well as low awareness of lifting policies, and extensive walking around the work-space. This work had poor focus on the positioning aspect of manual handling; therefore, important gaps in patient positioning practices remain, including the ongoing high prevalence of WRMSDs among HCPs and the lack of evidence-based safe techniques for lateral patient turning, repositioning, and bed mobility [13,14]. Although the introduction of pressure redistribution mattresses was designed to reduce a patient's risks of pressure injury, their envelopment and immersion properties may reduce patient bed mobility and increase dependence [15,16]. In addition, HCPs have been reported to revert to manual lifting rather than using positioning devices due to multifaceted challenges that include time factors [13,17], aversion to devices, patient preferences, and devices not affording a simple workflow [18]. These factors indicate that innovative solutions for manual handling during patient positioning should be considered in their context and alongside challenges to successful implementation [19–21]. Given the evolving nature of health-tech and healthcare processes, it is necessary to provide an update in the literature with a focus on enhancing the safety and efficiency of manual handling tasks during patient positioning.

The current study adopted an in-depth qualitative method to explore expert opinions on the challenging areas of manual handling during patient bed positioning in long-term care settings. Such methods are valuable for exploring the nuanced experiences, decision-making processes, and contextual factors that shape how HCPs perform patient-handling tasks [22,23]. The expert consultation approach was utilised in this study to delineate the primary challenges from the perspective of subject experts. Although expert consensus is situated at a foundational level of evidence [24], it serves as an indispensable scaffold for future empirical research [25–27]. This study aimed to gain an in-depth understanding of expert opinion on the problem area for caregiver occupational health and patient well-being during patient positioning. As well as exploring diverse insights on how to optimise approaches to manual handling during patient bed positioning.

## 2. Materials and Methods

### 2.1. Research Design

This study employed a qualitative design, utilising semi-structured interviews of manual handling experts [10]. As a preliminary investigation, interviews with the experts were utilised for their efficiency in gathering a spectrum of current subject knowledge to define the scope of the topic and to guide subsequent research [28].

### 2.2. Research Participants

A purposive sampling technique was used to recruit nine experts (aged 30–62 years) in senior manual handling roles. These roles included healthcare service managers, manual handling trainers, or allied health specialists in the UK, working in one of the following areas: academia, private practice, training, healthcare facilities, and regulatory bodies, who had directly engaged with patient manual handling for at least one year (Table 1). Those in clinical roles only, who were not in manual handling management or trainer positions, were excluded from the study as non-specialists. Participants were only recruited from the UK, given the potential differences in safe handling practice and policy between different countries [29]. The sample size of most qualitative studies has been kept low but has aimed to elicit in-depth and quality data across a varied range of participants [10]. Therefore, the sample size of this study was sufficient to explore the research questions. The purposive sampling and online data collection also allowed inclusion of participants from different regions of the UK. Participants were recruited by sharing research adverts and standardised

invitations across relevant public institutions and social media platforms. Recruitment was further supported through snowball sampling, with participants sharing the advert within their own networks, and additional dissemination through the research team's professional and collaborative networks.

**Table 1.** Manual handling experts' demography & work characteristics.

Partic ipants	P/NAL B/ground	Role(s) in manual handling	Experi ence (yrs)	Work settings
P1	Manual handling litigation & law.	Trainer, policies enforcer, assessor, & equipment installation.	> 20	Hospitals
P2	Physiotherapy	Clinician, assessor, academician	10-20	Hospitals, charity, & University.
P3	Occupational Therapy	Clinician, trainer, supervisor, academician	>20	Hospitals, care homes, community, & University
P4	Occupational Therapy	Clinician, assessor, trainer, academician, expert witness	>20	Care homes, community, & University
P5	Nursing	Clinician, assessor, trainer, equipment installation	>20	Hospitals, care homes
P6	Occupational Rehabilitation	Manager, trainer, assessor, supervisor, coordinator, Clinician	>20	Hospitals, Care homes, & community
P7	Physiotherapy	Clinician, assessor, trainer, equipment installation	>5	Schools, care homes, & community
P8	Occupational Therapy	Trainer, assessor, practitioner, Supervisor, equipment installation.	10-20	Care homes, community
P9	Physiotherapy	Clinician, assessor, equipment installation	>5	Hospitals, Care homes, & community

Keys: NVQ= National Vocational Qualifications; HCPs= healthcare practitioners; P/NAL B/ground= professional background.

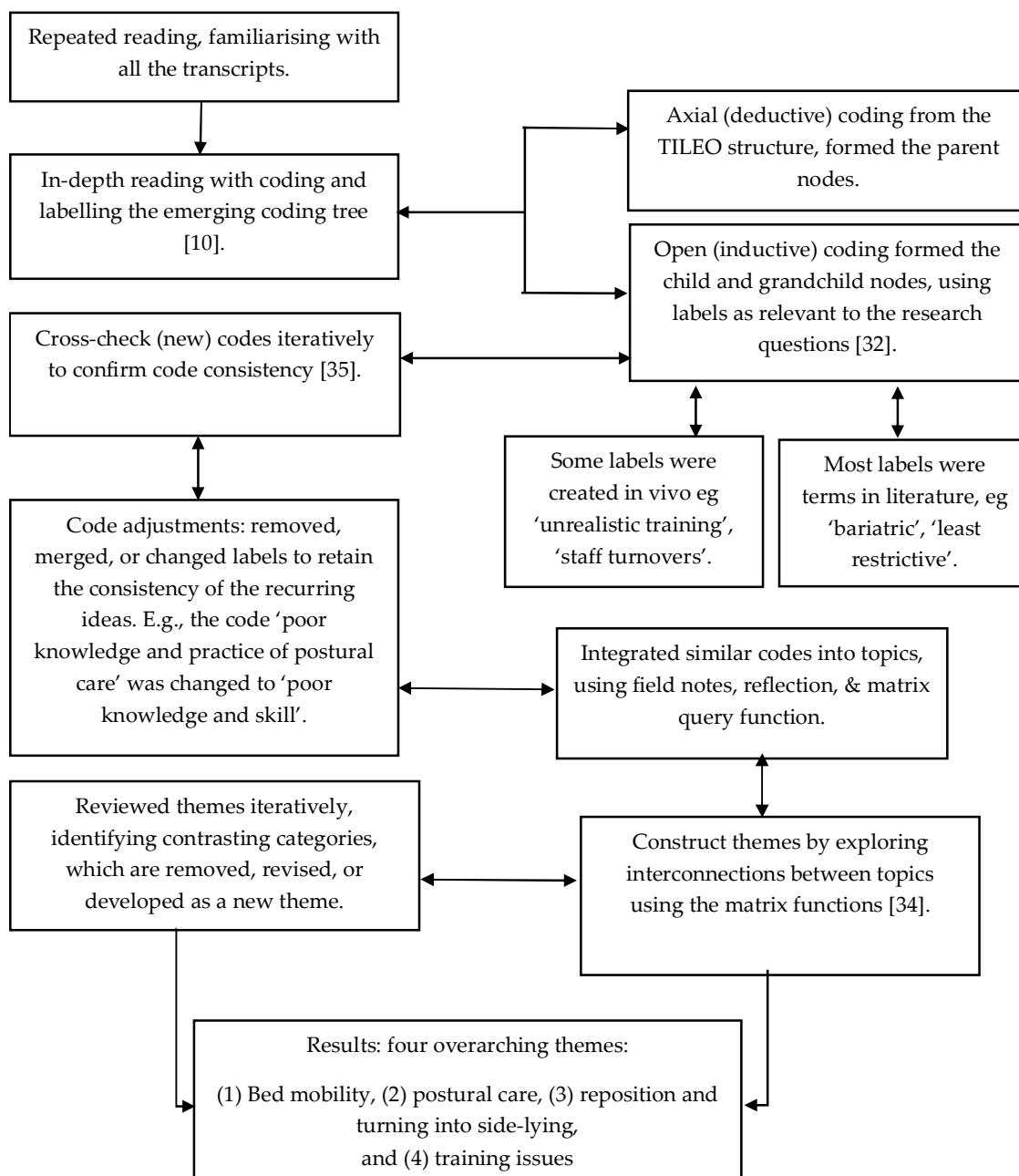
The study received ethical approval from the University's Health Ethics Committee (HEALTH 01051). Participants completed digital informed consent by agreeing to consent statements in an online Microsoft form, and the study conformed to the Declaration of Helsinki [30].

### 2.3. Procedure

Volunteers contacted the researchers directly and were scheduled for an online interview if they met the inclusion criteria. Interviews were conducted one-to-one with each expert through a single virtual Microsoft Teams meeting that lasted 45 to 90 minutes, depending on the individual's experience. Participant demographic questions and work characteristics were recorded online following digital consent. The interview schedule focused on gaining an understanding of the problem areas in aspects of manual handling practice for patient positioning. This included topics like types of patient positioning, postural care, repositioning, and turning, along with manual handling techniques such as bed mobility and positioning devices. Participants' recruitment and interviews continued until data saturation was attained. Interviews were audio-recorded in an anonymised format and transcribed to enable analysis [31].

#### 2.4. Thematic Data Analysis

Interview transcripts generated by Microsoft Teams were carefully checked against the recording, edited, and proofread to ensure accuracy. The transcripts were then imported into the NVivo software (version R1.7, USA), which was used to aid the arrangement of overarching ideas to afford effective data handling and analysis [32]. The thematic data analysis approach, as recommended by Braun and Clarke [33], was used as described in the steps in Figure 1.



**Figure 1.** Flowchart of thematic data analysis steps followed.

The various emerging and recurring ideas were integrated to identify themes consistent with the experts' descriptions [36]. The themes were iteratively reviewed and revised to explain contrasting findings and fit with the original data [37]. When the contrasting data is upheld as truth, the theme or subtheme is revised or changed [35]. The interrelationships that resulted from the thematic analysis supported four overarching themes related to the task, caregivers, patients, and the care environment, other factors (TILEO framework), and suggestions for their optimisation: (1) bed mobility, (2) postural care, (3) reposition and turning into side-lying, and (4) training issues.

### 3. Results

The four themes highlighted the challenging areas and opportunities for optimisation in manual handling during patient bed positioning (Figure 2). The key subthemes are consolidated into groups based on the TILEO Framework (Section 3.1 – 3.4).

#### Bed mobility

##### Task-related factor

- Encouraging bed mobility

##### Caregivers related factor

- Caregiver's knowledge
- Time factors
- Staff turnover & shifts
- Loss of enablement

##### Patients' related factor

- Patients' behaviour/ preference

##### Environment-related factor

- Soft support surfaces

##### Optimising bed mobility

- Patient actively involved
- Making out time/rapport
- Simplify tasks
- Integrated low-tech devices
- Single-handed/optimised care

#### Postural care

##### Task-related factor

- Inserting sheets
- Require precision

##### Caregivers related factor

- Caregiver's knowledge

##### Patients' related factor

- Posture deformities
- Poor sleep

##### Environment-related factor

- Poor pillow standard

##### Optimising posture care

- Repositioning along other care processes
- Patient comfort
- Spine/pelvis alignment
- Cushion devices- breathable pillows, wedges/sleep system

#### Reposition & turning into side-lying

##### Task-related factor

- Inserting sheets/slings
- Single-handed care
- Turning
- Frequent repositioning

##### Caregivers related factor

- Caregiver's knowledge
- Informer caregivers

##### Patients' related factor

- Bariatric
- Patients' behaviour (Resistive etc)
- Vestibular system, & startle reflex
- side-lying hip pressure

##### Environment-related factor

- Soft support surfaces
- Community device fits

##### Optimising repositioning & turning

- Firm support surfaces- stability & comfort
- Use of hybrid mattress
- Use of wedges, in-bed sliding system, overhead hoist, & turning bed.
- Single-handed care
- Sleep quality/ side-lying angle >30°

#### Training issues

##### Task-related factor

- Bed mobility, Fowler's position
- Postural care, Side-lying
- Reposition and turning,

##### Caregivers related factor

- Motives for training
- Staff turnover/Agency
- Unrealistic training
- Lack of guidelines

##### Patients' related factor

- Complex presentations

##### Environment-related factor

- Lack of training in patient settings
- Lack of training on optimised devices & systems

##### Optimising training practice

- Realistic training
- Regulating trainers
- Designating moving & handling person
- MDT in handling care
- Organisational support & safety culture

Source: Authors' own

**Figure 2.** Themes and subthemes of challenges and optimised approaches in manual handling for patient positioning based on the TILEO framework.

### 3.1. Bed Mobility

Experts described bed mobility as promoting patients' functional activities by encouraging and supporting their participation in moving as much as they can while on the bed.

*Silly little things of getting patient moving just by asking them to raise their arm or nod their head, or twitch their toes. ...it is all mobility (P1).*

*...much more of a focus now ...to improve ...bed mobility and independence. ...in the past it's been ...to get a lift team... (P3).*

In practice, bed mobility included encouraging the patient to lean forward whilst inserting slings or rolling, lifting their limbs to support dressing, and bridging to enable pad change. The ability to implement bed mobility was highlighted for reduced HCP workloads and enhancing patients' rehabilitation.

*...bed mobility done correctly for manual handling is A+... (P1).*

#### 3.1.1. HCP-Related Bed Mobility Factors

HCPs' identified limitations in the ability to assess patient capacity, often resulting in the provision of unnecessary care, with contributing factors including time pressures, skill level, and the quality of rapport with patients. Time factors were highlighted as effective bed mobility often required giving the patient time to process and implement the desired movement.

*...we are putting endless amounts of care and not enabling people... ...it takes time to develop that relationship ...to ask them to help ...a lot of patients ...are really helpful, ...but their input is very often taken away... (P4).*

The relationship needed to achieve effective bed mobility was reportedly compromised by shifting care and high turnover among HCPs with varying levels of experience.

*...if you've got staff that...are, ...up to speed and know that patient, they can do things differently. But then you've got staff ...who will be, let me do it for you, love... (P6).*

The need for bespoke skills, delivered with sensitivity and professionalism, to encourage patient functional independence was highlighted. Sensitive handling was emphasised because encouraging patients to attempt tasks beyond their current capabilities may feel counterintuitive and undermine effective engagement.

*...example, ...palsy ...might on the surface not have active movement, but when ...you actively assist them, you can feel their movement. ....it requires that sort of sensitive handling to know what they can do... (P7).*

Consequent to excessive support, P3 highlighted the issue of "pyjama paralysis" where patients in admissions "take on a passive role", culminating in the risk of being de-skilled and increasing their dependence on caregivers.

#### 3.1.2. Environment-Related Bed Mobility Factors

Participants recommended that bed mobility should start from what the patient can do as soon as they are admitted, helping reduce potentially disabling impacts. However, this was noted to vary across care settings and practitioners, being least practised in hospitals, especially in acute settings, and by younger staff.

*Some care homes [intermediate care] will tend to encourage someone to do ...for themselves more than within a hospital environment... (P3).*

Intermediate care homes were described as more rehabilitation-oriented, helping to promote functional independence, with P7 describing them as having "...a lot more of a goal-oriented

approach to their stay. It's an intermediate bed, so you need to get to this level of function... whereas residential people are there to live".

This contrast was explained by the palliative and social care focus of nursing and residential homes, and common patient presentations relating to poor positioning or postural care, for example, "...the elderly with dementia ...seen ...curled up in a ball, ...have no positioning equipment" (P4).

### 3.1.3. The Impact of Support Surfaces on Bed Mobility

Common equipment-related challenges were described in relation to the use of soft support surfaces, including active mattresses used for pressure ulcer management. These were reported to impair bed mobility due to their envelopment and immersion properties. According to P3, "...the bed moves, but they tend to never move... Especially...those ...with reduced muscle tone or weakness".

*...if you are trying to support somebody to bridge...or to roll, it can be harder if you've got a very soft surface... (P7).*

Also, because of the dynamic nature of the active beds, some of the experts noted that it could be intolerable to those living with cognitive impairment.

*...dementia patients do not like...active mattress...they tolerate hybrids because there is no movement (P1).*

### 3.1.4. Optimising Bed Mobility Practices

The skills and approaches identified for optimising patient bed mobility included communication, patience, and rapport. These aimed to boost patients' courage to take an active role in their care.

*...if you develop a relationship with them, explain what ...and why...you will get far more help ...because they won't be as anxious and...afraid..., stand close to them... a little conversation...joke... they love that (P4).*

Then, breaking the movement down was noted as an important strategy to encourage patient bed mobility.

*...for example... rolling, can you turn your head to the right? ...I'm going to assist you. ...I am bending your hip (P7).*

Several innovative, low-tech aids were used to promote bed mobility, including bed levers, profiling beds, overhead hoists, slide sheets, and wedges. These adaptations were stated to boost patient independence and help reduce the need for extensive care packages. For example, bed levers or bedrails could be grasped by patients to assist in getting up or turning. However, there appeared to be marked controversy surrounding the proper use of bedrails.

*...they might be able to reposition themselves ...using it, but they need to be able to cognitively know ...why the bedrail is there... else if they want to get out..., they've got to wait for somebody else to come and take the rail down [which makes it restrictive] (P2).*

The profiling bed was indicated as useful for supporting bed mobility by adjusting its height and raising the headrest to sit patients up, allowing them to assist with transfers, initiate mobilisation, and change their position. In addition, the use of overhead hoists, wedges, slide sheets, and optimised techniques was indicated as helpful in reducing the number of care packages without compromising patient safety. For instance, the slide sheet could be applied beneath the patient to assist them in moving themselves, including boosting with minimal assistance.

*...with a positioning wedge ...to stop them rolling onto the back ...then it can be done single-handedly... that simple wedge can replace a carer. It's ...extra pair of hands (P3).*

*Some people don't need carers; ...they need ...equipment..., it's usually the rolling and moving someone up the bed that ...puts caregivers at risk (P8).*

The hybrid mattress – part foam, part air-cell and described as midway between standard foam and active mattresses - was an optimised option for soft surfaces. It was reported that the system could be set to static mode during patient care, but most HCPs were unaware of this feature.

*...when using an active mattress, ...you want the bed to be put into static mode... but caregivers can forget to put it back on normal mode..., no matter how much you teach someone, they still don't use the mattress as it should be. ...or the risk of staff assuming that the patients on an active mattress don't need re-positioning. ...they still need to be moved, so the challenge to the patient is they'll get left... (P1).*

In contrast to the limitation from caregivers' tendency to forget to reset the active bed, P7 indicated that some of the hybrid mattresses could be "set on auto firm, ...it stays firm for 10 minutes, and then it can go back to alternating pressure flow".

### 3.1.5. Optimised Handed Care: Single-Handed and Proportionate Care

Single-handed and proportionate care were identified as optimising bed mobility practices, which could help maintain the safety and dignity of patients. Experts argued that organisational policies defining the level of assistance needed by patients might pose challenges and be unsafe for their independence if the policy is blanket on partnered care. In this situation, P4 insisted that it is "not breaking the law by saying one caregiver instead of two".

It was noted that the healthcare assistants, especially those from agencies, often report reduced care packages as challenging.

*...if there are two people four times a day, we will look to ...reduce that to one person in the lighter part of the day. ...is a big area of conflict ...effectively they think they're losing another payment there... you could see the resistance from the care agencies... (P4).*

These are highlighted as proportionate care by accommodating the fluctuating needs of patients across different care environments, tasks, and available equipment. For instance, showering a patient might require more packages of care compared to feeding the same patient. So, different and proportionate levels of care could be sent in for these different purposes.

*...being innovative with the care package... we recommend appropriately for whatever that person needs (P4).*

On the contrary, P9 argued that the assistance of two should be promoted over single-handed care because "one person would think they'd have to provide more support to get that person wherever they needed in the bed, whereas with a second person, ...physical assistance is shared between the two".

### 3.2. Posture Care

This involved supporting safe and rehabilitative postural management, including achieving symmetrical, comfortable, and recovery positions for improved patient outcomes. Such improvements in patient outcomes were reported to ease handling tasks.

*...If patients are not comfortable, ...you're not going to get anything out of them...the next day. ...if your patient is safe... then staff too. ...it's about a two-way road (P1).*

Postural management was indicated as key to reducing contractures and pain, as P7 explained that "...if we can keep somebody in a symmetrical posture... then they're going to be able to have more function and more independence... and not be in pain". This was also reported to have directly impact on patient sleep quality, with consequences to their recovery and rehabilitation.

*...sleep quality ...link to patient energy the next day, as well as the ability to repair and heal... are important ...when planning patient repositioning overnight (P9).*

### 3.2.1. HCP-Related Posture Care Factors

HCPs were reported to have limited knowledge of postural care, particularly because its application varies across different patient groups. Postural care reportedly requires more bespoke skills compared with repositioning and turning alone. Most experts identified a gap in caregivers' ability to support effective postural care, largely due to insufficient education on this topic within manual handling training.

*Every day..., ...you just see that the staff haven't taken the time to position them correctly. ...they're left in that destructive posture over periods... (P4).*

Wedges and sleep systems were noted to be of limited use, as some HCPs seem not to understand their importance. Also, their use and skill set are not shared across the healthcare role, such that some would remove it or place it incorrectly.

*...what some [HCPs] do is to wedge a load of pillows on the patient ...but pillows do not breathe. ...there is a risk of putting pressure areas ...we do need to have things like a sleep system (P1).*

### 3.2.2. Device-Related Posture Care Factors

It was noted that postural care required greater precision in the placement of different body segments and was unlikely to be fully achieved without appropriate positioning devices. According to P5, the high-tech devices like turning systems "are great if all you want to do is turn somebody..., but when you add in posture management..., that's when it can be difficult".

Variations in pillow standards and a lack of guidance on selecting appropriate pillows for different patient needs were reported.

*...everyone's got a different-shaped pillow. ...it's hard to prescribe what style, thickness, and thinness would be suitable for a particular client (P7).*

### 3.2.3. Patient-Related Posture Care Factors

Patients with complex postures, due to conditions such as scoliosis, kyphosis, spasticity, and contractures, were highlighted as presenting additional challenges. These individuals were noted to be at increased risk of adopting maladaptive postures, such as the foetal position, which required greater physical effort to ensure adequate support. Such deformities were also reported to increase pressure and discomfort in vulnerable areas, thereby increasing the frequency of repositioning needs.

*...positions that I tend to prevent, ...wind-sweeping posture. ...worsening scoliosis. ...rib cage deformities, pelvic deformities, ...to avoid bilateral external rotation, abduction postures. ...kind of frog-legged posture. ...pronounced contractures. ...to prevent...body shape changes (P7).*

Patients with pressure injuries were reported to require increased unloading of affected areas. Those with medical support devices, such as arm slings, were also identified as having additional areas at risk, which posed further challenges to effective postural support.

*...if weight is not evenly distributed... can...cause injury to either the caregiver or the patient..., it will be difficult to slide such a patient [those with posture issues and injuries] using the slide sheet... (P9).*

### 3.2.4. Optimising Posture Care Practices

Experts highlighted the need for all individuals involved in patient manual handling to have a strong understanding of, and skill in, postural management. They recommended using posture care to correct or prevent contractures, improve pressure distribution and comfort, align the spine with the pelvis, and prevent body shape changes.

*...create a stable base. ...support along the back. ...with the top leg supported..., and the body is not at risk of over-rotating either way...no risk of the malleolus ...contact with their skin... (P7).*

Achieving adequate postural care often involved the use of appropriate supportive devices, such as cushions, to optimise posture. Commonly used devices included rolled towels, breathable pillows, wedges, and sleep systems.

*The use of pillows and sleep systems would enable...a more symmetrical position, ...reduced pressure, ...less risk for pain. ...even pressure redistribution (P4).*

Sleep systems were described in different forms, including a beam bag or a long sausage that can tuck around the body, and were moulded to the patient's shape. Others were wedges with block systems and breathable material placed around the head, shoulder, and hip.

*...it's one thing getting them turned with a slide sheet or a turning bed. ...then you have to put your positioning wedges in to hold them in that position (P1).*

The use of a sleep system was thought to be effective in reducing workloads, easy to use, and comfortable for the patients. According to P1, "they found them quite easy, ...then they're not going back ...to keep repositioning ...because patients rolled back... They [patient] do like them; they often go and get more".

However, some experts noted that wedges posed challenges when left in place overnight or when required to remain positioned for prolonged periods, particularly in community settings where HCPs had limited time with patients. Pillows were mentioned less frequently as optimised tools for postural care, except when used as an adjunct to sleep systems. Most experts were critical of pillow use, despite pillows appearing to be the most commonly used in practice.

*...if you add a heavier person and just put a pillow..., the pillow might sink..., whereas the wedges won't. ...it ...grips the bed sheets...if someone needed that specialist kind of equipment, ...it's not very prescriptive to ...use a pillow (P8).*

Rolled towels were used as an improvised solution when sleep systems or pillows were absent or insufficient. P7 explained that they were placed under the sheet to avoid direct contact with the patient's skin.

*I have... put up a rolled-up towel inside a pillow with a pillowcase... So, ...sometimes..., with low tech, you can adapt it (P7).*

### 3.3. Repositioning and Turning into Side-Lying

Supine positioning was well noted as comfortable for many patients, and many caregivers find it easy. However, leaving patients in supine for long periods increases pressure at bony prominences, necessitating repositioning to side-lying to enable pressure redistribution.

*...a lot of them are supine. Because they don't have the strength to be able to roll, ...[hence, need for repositioning] (P4).*

Repositioning and turning were indicated as a major and frequent component of the manual handling task. This was often recommended alongside the use of support surfaces for patients who are immobile and at risk for pressure injury. According to P1, "...a tissue viability nurse would ensure that the person gets the right grade of the mattress and is repositioned..."

#### 3.3.1. HCP-Related Factors for Repositioning and Turning

Common limitations from the HCPs included knowledge and skill gaps and psychological factors. The younger and male HCPs, for instance, were noted to appear unbothered about the long-term consequences of poor practices. Describing the psychological factors, P1 noted that "...sometimes caregivers could see a bariatric patient as a problem and think, Oh..., I'm going to struggle to move them... but sometimes they're the easiest to move".

Other gaps were noted in HCPs' side-lying practices, including low awareness of side-lying tilt-angle, use of supportive devices, and using the semi-side-lying.

*...if we were to lie on our side, we are directly over our shoulder, but we can reposition..., whereas some patients cannot. ...and need support into semi-side-lying...but some HCP struggled to understand the semi-side-lying position... (P9).*

They further explained that the existing positioning guidelines, which recommended a side-lying tilt-angle of up to 30°, were not well known. Thus, many times when patients were repositioned to side-lying, they were still in supine or fell back to supine within a short period.

*...we've got the 30° [NICE] guidelines, but ...people just don't have a clue... (P3).*

### 3.3.2. Device-Related Factors for Repositioning and Turning

The limitations of slide sheets for repositioning were commonly noted for inserting/removing the sheet beneath a completely immobile patient. Depending on the caregivers' skills, some of the experts argued that slide sheets involved some manual effort to roll the patient to get the sheet underneath. These were pronounced where the patients had complex presentations, such as bariatric and those with postural issues.

*...it's very dependent on caregivers, ...and if you've got a larger individual ...individuals with more complex postures...is more difficult trying to get it [sheet] under them... (P9).*

*...I don't think you can ...get the sheet under somebody who is completely immobile. You'd have to do a lot of pushing... (P4).*

Secondly, there are possible challenges from a wide variety of sheets. Although some experts noted that they make sure there is only one variant supplied to their facility.

*...we tend to issue the full-length sheet...if they are used incorrectly and the patient's whole body's not on that sheet..., then there's going get more friction which could put more strain on the caregiver... (P8)*

Slide sheets' usage in most policies does not encourage single-handed care, as partnered care is mostly recommended. For partnered use, having caregivers with different heights was noted to affect smooth sliding, with the risk of increased strain on the caregivers whose physique did not fit the bed height. Some poor practices were noted where HCP would do it manually or use bed sheets to slide patients. Such poor practices were often blamed on time factors, although they increased the workload as the patients would still be in the wrong position, requiring more adjustments.

*You will always hear ...we haven't got time to do that... It's just quicker to grab the bed sheet. ...they would always use that time factor. ...but in training..., they're like, Oh my goodness, that is so easy... (P1).*

The experts also noted the ergonomic position of the caregivers, not using the slide sheet properly, and improper weight transference technique from the leg to protect their elbows, back, and spine, causing them to twist.

*...I think slide sheets can be quite difficult if they're not used properly..., removing a slide sheet can cause friction and shear against the skin if not done carefully. ...slide sheets that are not checked and reviewed could tear and might not slide well. ...slide sheets, like others, are a tool and their use depends on the training and skills of staff... (P7).*

For other experts, the patient's vestibular system might be impacted if a slide sheet were used for turning. This was due to producing a quick turn.

*...the use of slide sheets to turn..., is often very quick..., whereas the in-bed sheets and turning beds ...are a lot slower..., it doesn't affect the vestibular system...with the slide sheets, ...you don't have control, and you're very reliant on the physical ability of the caregivers to pull with the sheet...(P5)*

Mechanical lifts, such as a hoist, were indicated as useful for supporting patient handling in bed. However, some limitations with the use of hoists were noted, including the risks of accidents, usually due to HCPs' skills in fitting the slings and positioning the patient correctly. Choosing the right slings

for hoisting can be an issue among staff with poor knowledge, which could lead to several injury risks for the patient.

*They're still at risk of breaking, but ...overall, they are really good. ...useful for reducing the manual handling injury risk... (P7).*

Another challenge highlighted was the limited fit in community settings. Some patients tended to find the equipment big and scary psychologically.

*The problem with them is the size of rooms, doorways, in community settings... and some families don't want a ceiling track hoist because it's not aesthetically pleasing, ...they prefer the gantry... (P6).*

### 3.3.3. Environment-Related Factors for Repositioning and Turning

The care environment was reported to impose limitations, including restricted care space and the use of family-provided or non-prescriptive support surfaces that were too low or positioned against a wall, preventing caregivers from accessing both sides of the bed.

*...some people ...in the community, are on family beds. Memory foams...in a double bed. ...or non-profiling bed...you would need to get your knee on the bed and manually pull to sit them forward... (P6).*

The service users' choices and willingness to cooperate with best-interest care decisions were reported to be poorer in community settings than in hospital settings. Participants working across both contexts explained that individuals in hospital environments tended to demonstrate greater concordance, whereas those in their own homes exercised more personal control. This was reported to make the management of moving and handling more challenging in community settings.

*...I've known people to have hurt themselves because of the requests that patients have made. ...because you want ...people to make choices... (P7).*

These limitations were reported to be more pronounced when the primary care provider was a family member, other informal caregivers, or a paramedic. As P2 noted, "they ...often lacked the appropriate equipment, the training, and the knowledge".

Another care settings-related factor indicated was the urgency and workload in many acute care settings, especially A&E.

*...I collect a lot of instant reports ...and 9 times out of 10 ...is from A&E. ...issues why they haven't used equipment. ...you'll always get the same thing...we are so busy in A&E, ...We're like a war zone, we got 23 hours waiting list... (P1).*

### 3.3.4. Optimising Low-Tech Solutions for Repositioning and Turning Practices

The experts explained that, with appropriate caregiver skills, a suitable environment, and the use of appropriate innovative handling devices, manual handling for patient positioning could be carried out with minimal physical effort.

*...by replacing holding with wedges, ...rolling and turning with a turning sheet, ...pulling and pushing with an in-bed sliding system hooked to a hoist, and replacing lifting with a hoist, the challenges ...could be reduced (P4).*

Meanwhile, some experts added that it was impractical to eliminate manual effort during patient bed positioning due to the multifactorial nature of handling care. While P5 asserted that "...it would be great if we could have equipment out there that involved limited or... no moving and handling", P9 acknowledged that, "...there is always an element of physical effort depending on the patient's capacity"

Many experts suggested that, with appropriate training and technique, the insertion and removal of slide sheets could be achieved to facilitate patient turning and repositioning with minimal manual effort.

*...with the techniques and knowledge..., it's [slide sheet] not a problem... When they're two flat ones, we start at the head and then turn them inside out. ...putting the hand underneath and pulling it... (P1).*

*...you can put slide sheets underneath without moving the patient. ...you can introduce them from the top and just unravel them down underneath them... (P6).*

The experts also indicated that slide sheets could be used to facilitate the fitting of slings for other devices by passing them between two flat slide sheets positioned underneath the patient.

*...we've invented a couple of techniques where you don't have to do any hands-on ...you can fit the sling ...no rocking and rolling. ...you can just slide it between these two sheets (P5).*

The use of slide sheets could be further optimised through in-bed sliding systems which perform all the functions of standard slide sheets, with the added advantage of being left in situ on the bed, thereby reducing the difficulty associated with inserting conventional slide sheets. Thus, for P8, it is ideal "...if you've got somebody that spends an awful lot of time in bed or maybe is at the end of life, ...and can't assist".

Unlike standard slide sheets, which were reported to be uncomfortable to lie on or to pose a risk of accidental slipping, in-bed sliding systems were described as more secure, as "...they have like a brake system, so when they are tucked in properly, it stops the sheets from sliding over each other" (P3).

The system was also reported to facilitate smoother turning and "...they all have handles and loops ...that ...can hook onto a hoist and ...use that to roll and turn the person..." (P6).

In contrast, the in-bed sliding systems were reported to be unavailable in many care facilities, and pose difficulty changing them when soiled, similar to changing an occupied bed. Also, the risk of inappropriate use by some HCPs who might not lock it properly, leaving the patient at risk of sliding off.

*...in-bed sliding system as well, ...have to be changed. ...if ...they're incontinent...if they had a hoist, it's easy to do, just hoist the person up and then change the sheets (P4).*

### 3.3.5. Optimising the Mechanical Lifts for Repositioning and Turning Practices

Common mechanical devices included overhead hoists, which could take the form of ceiling track, gantry, or mobile hoists. Some experts noted that freestanding gantry hoists were preferable for short-term solutions, such as for individuals expected to regain independence.

*Hoist ...can help sustain the person ...while doing personal care...it can help to roll... if you've got a ceiling track hoist, you can minimise the number of staff needed ...as long as they are competent... (P6).*

Mobile hoists were also available, though experts noted their limitations, including the need to be manually dragged or pushed and often requiring two HCPs, unlike ceiling track hoists that provided automated movement. Ceiling track hoists were reported to function independently of floor coverings, making them easier.

*...a lot of the caregivers who have used a ceiling track hoist have reported how much easier it is than mobile hoists. ...you've also got ceiling track hoists that are on an H-frame system, which gives...more manoeuvrability... (P7).*

Additionally, overhead hoists were reported to contribute to a positive patient experience, depending on the skill of the caregivers. As P5 highlighted, "...it gives a smooth ride. That's what I've been told by the service users".

Turning beds and other assistive turning solutions were also discussed as innovative device options. Turning beds were reported to facilitate rolling and repositioning patients through a four-way gliding system. According to P1, this is for "...any patient that can't withstand having slide sheets put underneath them... it is a push button with ...foot and ...hands on the patient"..

The main limitations of turning beds were reported to include the potential to elicit a startle reflex in patients, as well as the need for caregivers to provide holding and support. Turning beds were also noted to be uncommon in many care settings, particularly in care homes, due to cost.

*...they are very expensive...that would have a huge impact on them being used...within the NHS ...and local authority...have to be a private purchase (P3).*

The turning bed, like other high-tech mechanical devices, was also noted for its poor fit for postural management because of the precise support needed during posture care. According to P5, "...it will turn the whole body...you have to adjust and put everything to precision, which might involve pulling and pushing".

#### 3.4. Training Issues

Training received by HCPs on manual handling for patient positioning was reported to be poor and inconsistent across facilities. Some training was described as unrealistic because healthy subjects, rather than real patients, were used for practical demonstrations. Experts argued that real patients could present challenges such as altered muscle tone or strength, difficulty moving, clinical obesity, or resistance, whereas healthy subjects often had good muscle tone and might unconsciously assist during demonstrations.

*I see too much bad practice ...to say that the training is good enough. ...it's more than just moving a person around during training ...or going in and doing a demonstration once... we need to spend time with the agencies and support workers during training, showing them, ...until...they're competent... (P4).*

Experts also reported that it was not good practice to teach practical skills online relying on video-based instruction. This problem was linked to a lack of standardised guidelines for manual handling practices across care settings in the UK.

*I ...don't think the systems are in place...the standards of manual handling practice are slipping, ...is at the bottom of the pile... organisations...don't have their own moving and handling person... a lot of trainers ...are not registered with any regulatory body...there are no...endorsed courses for trainers. ...there are fantastic practices out there... but at the moment it's a bit of a free-for-all (P6).*

Due to the absence of established guidelines and their effective implementation, variations in practice and manual handling policies were reported across institutions. P8 noted that "there's just guidance which suggests that you should be trained to meet the roles of your job, but ...the standard of training out there is so different from one organisation to another..." Additionally, available trainings were reported to lack adequate coverage for topics such as sleep systems, postural management, and bed mobility.

*I think ...there's the absence of guidelines. I don't think there's enough done on posture and sleep systems ...and how it affects mobility (P1).*

##### 3.4.1. HCP-Related Training Factors

HCPs' motivation and psychological factors were reported as notable barriers to the effective translation of training into practice. For example, unlike entry-level or university education, which is inherently structured, compulsory on-the-job manual handling training and continuous professional development programmes

*...lack the theoretical in the undergraduate level of training that helps to shape one's awareness...brain and then mindset because sometimes... they're just after getting into the job and getting their pay...they don't understand the importance of some of the policies and training... (P3)*

This low commitment to training and its translation into practice was reported to be more pronounced among agency staff, who were described as more likely to be profit-oriented and "only get...ad hoc training on how to just get into the job, and that makes them not really ...baptised into doing the right thing" (P3).

For these reasons, P7 argued that “...manual handling training can be very, very tick-boxy... They are not all that bespoke or person-centred...”

Other HCP categories that were noted to cause limitations were night staff “...because ...things might go under the radar at night ...there are fewer interprofessional interactions” (P7). Similarly, staff turnover was noted to make the training continuous but not progressive.

*...HCPs change so often... the turnover ...is ridiculous...you might start with a team ...and then one will leave... then another will leave. ...somebody new would take their place. ...it makes it sort of a rolling programme of education (P3).*

Some experts also noted healthcare as increasingly complex for HCPs who were not only required to learn about the patient, but also to understand the operation of multiple and new devices. To reduce this challenge, P1 noted that most of their recent “devices have a QR code... so they can scan with their phone... reminds them how to use it”.

These identified gaps in training reportedly impair the efficient matching of available innovative solutions with the right knowledge to use them.

*...all of these tools are... prone to human error, ...is not the tool that necessarily increases the risk as to how it is used..., the training, the support, and the guidance that goes with it (P7).*

### 3.4.2. Optimising Training Practices

Manual handling for patient positioning was reported to be the responsibility of all HCPs, as patient positioning should be implemented each time any of these HCPs make contact with the patient, such as during personal care, after administering interventions, or after feeding. Hence, all were expected to be able to support patient positioning.

*...people say ...my job is to nurse the patient. My job isn't the therapist to make them comfortable, which is worrying to be fair... I think it should be across the board... (P1).*

However, many professional care roles were noted to be increasingly shifted to the healthcare assistants.

*...Today, ...the nurses are becoming the doctors and the healthcare assistants are becoming the nurses. ...people don't have... time to go and do the things that they were originally trained to do (P1).*

To bridge this existing gap, most of the experts emphasised the need to review the training modules of each professional to match their current practice, with an emphasis on involving the health assistants in more training. Alongside the need for professional leadership and referral or involving more specialised expertise when needful. For example, “...knowing when to refer back to Physio...to review. ...report problems...” (P7).

Training staff and encouraging the adoption of new techniques or equipment were reported to be challenging, highlighting the need for manufacturers to ensure that equipment was intuitive to use “...because if it's not,...staff are going to be ...a little bit restrained about using it, ...their heart will sink when they see that piece of equipment...” (P5).

The experts also suggested key characteristics of best practice in delivering manual handling training, including integration of theoretical information with ongoing hands-on experience, risk assessments, individualisation of training to each patient, timely review of patient needs, and regular competency assessments.

*...personalise ...training ...theoretical awareness of neurological presentation and their impact ...It needs to be practical, hands-on, and ...ongoing (P3).*

*...we'll let them have another go and another go. Because ...when you're training staff, it's like driving a car... you...need ...a few goes and a few lessons... (P5).*

Another best practice recommendation was the designation of a manual handling person within each facility, responsible for providing on-site support, supervision, competency review, and ensuring that training extended beyond equipment use to include an understanding of best-practice

principles. Experts advocated shadowing by “...working with junior staff as a second handler...” (P6) and “...having a train-the-trainer approach..., quizzing at the end of a programme” (P7).

Consequently, the quality of caregivers’ training, experience, and knowledge was reported to influence their confidence, courage, the quality of their clinical decision-making, and their ability to gain patient cooperation. P2 explained that currently, “...not everybody has the same training, ...not everybody is as confident ...at using a piece of equipment ...or doing a particular task”.

## 4. Discussion

This semi-structured expert consultation sought to provide in-depth knowledge about the challenges in manual patient bed positioning and to identify current best practices for optimising care and reducing injury risks for patients and healthcare practitioners (HCPs). Patient manual handling during bed positioning in long-term care is challenging due to the high demand for hands-on care and the commonly reported low skill and limited knowledge of bed mobility, posture management, repositioning and side-lying techniques among HCPs. The poor implementation of these components of patient bed positioning was linked to increased risk of injuries among HCPs and their patients. For instance, the absence of adequate postural support during sleep could leave the patient much weaker, increase dependence, prolong hospitalisations, and impair health outcomes [38,39]. These contribute to an increased frequency of manual handling needs [14,40,41], with implications for NHS costs. The subsequent sections provide a detailed discussion of the key findings.-lying techniques

### 4.1. Implications for Bed Mobility and Posture Care

Whilst bed mobility involves encouraging and supporting patients to actively move in bed, this was identified as lacking in many practices due to low knowledge and awareness among many HCPs, causing them to provide more support than necessary. The high turnover of HCPs was also linked to poor patient enablement, as inconsistent care resulting from varied skills, unfamiliarity, and differing levels of support affected patients’ experiences [42]. Consequently, when patients continue to receive full assistance from HCPs, they may gradually become de-skilled and increasingly dependent, leading to greater disablement. This also aligns with the concept of ‘pyjama paralysis’, which suggests that continuous and excessive assistance can increase patient dependency [43,44]. The absence of proper bed mobility may therefore have a cascading effect, increasing manual handling needs. For instance, the physiology of the muscle is described as more aligned and prepared for planned movement when the individual is aware and involved in the task, especially for those with muscle problems such as spasticity [45,46]. Without proper bed-mobility support, both the HCPs and the patient may have to exert more effort, increasing the risk of overexertion and WRMSDs [47].

Effective patient positioning is influenced by both the approaches adopted and the positioning resources available [48]. Thus, inadequate repositioning, postural care, and bed mobility compromise pressure redistribution, patient rehabilitation and enablement, and can increase staff workload [49,50]. The findings of this study highlight several strategies to optimise bed mobility and other aspects of bed positioning, including: building good rapport with patients, optimising care to reduce reliance on partnered care packages, and minimising time constraints. Previous research has shown that time spent delivering single-handed care is significantly lower than the combined time required for partnered care [17,51,52]. Optimisation also requires the use of firm support surfaces and training all staff in therapeutic handling. Therapeutic handling focuses on rehabilitation toward functional independence, including effective bed mobility and postural care. This contrasts with traditional manual handling, which primarily prioritises safety and often limits positive risk-taking. Staff confidence in therapeutic handling can be developed through comprehensive and targeted training [3].

#### 4.2. Training and Non-Adherence Issues

Although positioning skills were often described as specialised and requiring professional training, many positioning tasks are predominantly carried out by care assistants once risk assessments and care plans have been established by licensed HCPs [53,54]. In particular, risk assessments for complex and fluctuating patient conditions often require specialist expertise due to the level of theoretical and clinical knowledge involved [55]. This suggests that many staff involved in repositioning may lack sufficient knowledge and skills in positioning care.

There is also limited awareness of how different side-lying tilt angles (15°–90°) affect pressure distribution, despite evidence that side-lying angles of up to 30° are effective for repositioning [56–58]. These gaps are partly attributed to inadequate training and poor adherence to recommended practices [59,60].

Effective use of positioning equipment and techniques depends on the training and competence of HCPs [61]. However, with the absence of a regulatory body for trainers, current manual handling training suffers from a lack of standardisation, unclear eligibility criteria, limited trainer qualifications, and inconsistent course content. Training methods also vary widely, with some programmes relying on video-based instruction or simulated models rather than real patient scenarios. As a result, training may be insufficiently realistic and poorly translated into clinical practice [59,62]. Besides, manual handling training alone does not reduce the risk of WRMSDs [21]. Consistent with Smith et al. [63], this study supports the need for person-centred, ongoing training that incorporates real-world patient situations, supervised practice, and competency-based assessment. This work further highlights expert-led recommendations that frame staff training as a continuous process of skill acquisition, which emphasises repeated practice, feedback, and consolidation over time, rather than reliance on one-off instruction.

#### 4.3. Practice Gaps in Repositioning and Turning to Side-Lying

There are currently no empirically validated safe methods for rolling and turning a completely dependent patient [64–66]. Consistent with challenges highlighted in the optimal-handed care model [3], this study identified that repositioning practices across care settings were varied and described as customary or anecdotal rather than evidence-based. Experts expressed mixed views on the feasibility of reducing HCP physical effort during turning and repositioning, largely due to the limited availability of cost-effective, low-tech solutions [65–67]. For instance, while overhead ceiling lifts significantly reduced injuries during lifting and transferring, they did not reduce injuries record [68], perceived injury risk, pain, discomfort, or compensation costs [67] when ceiling lifts were used for repositioning. Only the ergonomic evaluation study on turn-assist solutions of hospital beds for repositioning showed reduced physical stress [47]; but other studies noted it exceeded recommended thresholds for spinal loading and hand force injury risk [64–66]. In addition, the cost of such high-tech beds was often prohibitive [69]. These findings suggest that high-tech solutions may be limited in their ability to reduce WRMSDs due to the precision and extensive fine motor support needed from HCPs to complete patient positioning care.

Low-tech positioning devices, including wedges, breathable pillows, slide sheets, sliding systems, and sleep systems, are reported to be easy to use and readily available, enabling their integration into various care processes and across different caregivers [57,70]. This may also relate to their cost-effectiveness, simplicity, and support for a streamlined workflow [18]. However, laboratory and pragmatic studies consistently demonstrate that devices such as the slide sheets exceeded recommended limits for spinal loading and hand force during patient turning and repositioning [51,64,66,71–76]. Standard slide sheets have also been reported as difficult to insert and remove, likely due to variability in ergonomics and work technique [17,77].

Importantly, methodological limitations in existing studies may contribute to inconsistent findings. For example, Pay et al. [75] did not specify the patient's starting position during the turning task, and there is limited research on wedges, breathable pillows, and sliding systems. In contrast, experts in the present study described an optimised technique involving the insertion of half-folded

sheets, which are then unfolded beneath the completely dependent patient, without the need for prior rolling [63]. Safe handling ergonomics for patient slide sheet turning were consistently described as using an underhand grip close to the body, hand placement at the shoulder and pelvis, patient preparation through knee flexion and arm positioning, and turning through controlled weight transfer. In-bed sliding systems may further reduce discomfort during sheet insertion and removal [57,70,78–80], while supporting patient dignity, single-handed care, and timely repositioning [81]. In addition, an in-bed sliding system fitted with hooks or handles can be attached to a mobile hoist to assist with turning when appropriate [82].

#### 4.4. Single-Handed and Proportionate Care

In line with emerging literature, this study highlighted the need for greater use of single-handed care in health and social care [3,52,63,83]. This approach aligns with optimised positioning practices and may reduce the risk of disablement associated with over-support, while promoting patient dignity and reducing pressure on staff and the wider healthcare system [3,84]. Accordingly, low-tech innovations that support single-handed care are recommended to enhance bed mobility, reduce costs, and mitigate staff shortages, without compromising patient safety [84].

A few studies evaluated the optimised use of the slide sheet for patient turning into side-lying [75,85], and given that some of the experts in this study believed that slide sheet use still involves rolling, holding, and lowering patients, it remains unclear whether these optimised techniques are widely known or practised among UK-based HCPs. Only the commentary paper of Baptiste [82] proposed attaching a repositioning sheet to a mechanical lift to reduce physical effort during turning and repositioning. Further research is therefore needed to assess UK-based HCPs' knowledge of these optimised practices, assess their current practices, and determine how their practice has influenced the incidence of WRMSDs.

#### 4.5. Limitations

As is typical of qualitative research, the findings of this study may not be generalisable to all populations, as the aim was to gain in-depth insights from individuals with extensive expertise in the subject area. Because only subject experts were recruited, the findings reflect their perspectives and experiences. This may introduce a gap between theoretical or idealised practices described by experts and those implemented by frontline practitioners. A key strength of the study is the use of online interviews, which enabled purposive recruitment of participants from across the UK and captured variation in practice across different regions. Methodological rigour was maintained through iterative data analysis, ongoing reflexivity, supervisory oversight, and strict adherence to ethical research standards.

## 5. Conclusions

Healthcare bed tasks are often challenging due to the high level of hands-on care required, alongside limitations in training and inconsistent positioning practices. This expert consultation asserted that comprehensive, realistic training in the optimised use of low-tech positioning equipment can support safer, single-handed patient handling. This study highlighted a novel model and recommendations to optimise patient bed mobility, posture care, repositioning and turning into side-lying, aimed at improving patient outcomes and mitigating occupational risks. The findings can inform meaningful improvements in manual handling training and practice, support the development of more detailed clinical guidelines, and ensure consistent awareness among HCPs. Collectively, such changes may help reduce the prevalence of WRMSDs, sickness absence, injury claims, and staff turnover, thereby improving the quality and sustainability of care.

**Author Contributions:** Conceptualisation: SSE, JS, MD, and AC. Methodology: SSE, JS, JM, MD, and AC. Formal analysis: SSE, AC, JM, and JS. Data curation: SSE. Writing-original draft preparation: SSE. Writing-review and

editing: SSE, AC, JM, JS, and MD. Supervision: AC, JM, JS, and MD. Project administration: SSE, AC. Funding acquisition: AC. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was funded by the University of Lancashire Doctoral Training Centre for Industry Collaboration.

**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki and approved by the University's Health Ethics Committee (HEALTH 01051).

**Informed Consent Statement:** Digital informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The original contributions presented in this study are included in the article/supplementary materials. Further inquiries can be directed to the corresponding author.

**Acknowledgments:** The valuable contribution of the expert participants was pivotal.

**Conflicts of Interest:** The authors declare no conflicts of interest.

## References

1. Quality Compliance System. *Manual handling – have you considered the risk?* 2017. Available online: <https://www.qcs.co.uk/manual-h&ling-considered-risk/> (accessed 18 February 2023).
2. GOV.UK. *Research and analysis: Sickness absence and health in the workplace: understanding employer behaviour and practice.* 2021. Available online: <https://www.gov.uk/government/publications/sickness-absence-and-health-in-the-workplace-understanding-employer-behaviour-and-practice/sickness-absence-and-health-in-the-workplace-understanding-employer-behaviour-and-practice-report> (accessed 25 February 2023).
3. Local Government Association. *High impact change model: optimal handed care.* 2026. Available online: <https://www.local.gov.uk/our-support/partners-care-and-health/better-care-fund-support-programme-2025-26/optimal-handed-care> (accessed 05 February 2026).
4. UK Parliament. *Written evidence submitted by NHS England (WBR0082). House of Commons Health and Social Care Committee.* 2022. Available online: <https://committees.parliament.uk/writtenevidence/104543/html/> (accessed 10 July 2025).
5. Health and Safety Executive Bulletin. *Work-related musculoskeletal disorder update.* 2024. Available online: <https://content.govdelivery.com/accounts/UKHSE/bulletins/3c641e1?> (accessed 10 July 2025).
6. Tallis mobility. *Cost of manual handling accidents in the NHS.* 2026. Available online: <https://tallismobility.co.uk/cost-of-manual-handling-accidents-in-the-nhs/> (accessed 05/02/2026).
7. Abedini, R.; Choobineh, A.R.; Hasanzadeh, J. Patient manual handling risk assessment among hospital nurses. *Work* 2015, 50, 669–675.
8. Akbari, H.; Abadi, M.B.H.; Fesharaki, M.G.; Ghasemi, M. Assessing the risk of manual handling of patients and its relationship with the prevalence of musculoskeletal disorders among nursing staff: Performance evaluation of the MAPO and PTAI methods. *Iran. Red Crescent Med. J.* 2017, 19, 8.
9. Cantarella, C.; Stucchi, G.; Menoni, O.; Consonni, D.; Cairoli, S.; Manno, R.; Battevi, N. MAPO method to assess the risk of patient manual handling in hospital wards: A validation study. *Hum. Factors* 2020, 62, 1141–1149.
10. Bryman, A. *Social Research Methods*, 5th ed.; Oxford University Press: Oxford, UK, 2016.
11. Waters, T. R., Nelson, A., & Proctor, C. Patient handling tasks with high risk for musculoskeletal disorders in critical care. *Crit. Care Nurs. Clin. North Am.*, 2007, 19, 131-143.
12. Stucke, S., & Menzel, N. N. Ergonomic assessment of a critical care unit. *Crit. Care Nurs. Clin. North Am.* 2007, 19, 155-165.
13. Fray, M.; Davis, K.G. Effectiveness of safe patient handling equipment and techniques: A review of biomechanical studies. *Hum. Factors* 2024, 66, 2283–2322.
14. Ede, S.S.; Sinclair, J.K.; Dickinson, M.; Chohan, A. Challenges and best practices during manual handling for patient positioning in long-term care settings: A scoping review. *Phys. Ther. Rev.* 2025, 30, 1–17.
15. Peterson, M. J.; Kahn, J. A.; Kerrigan, M. V.; Gutmann, J. M.; Harrow, J. J. Pressure ulcer risk associated with patient-handling sling use. *J. Rehabil. Res. Dev.* 2015, 52, 1–10.

16. Chiang, J.-C.; Lie, W.-N.; Huang, H.-C.; Chen, K.-T.; Liang, J.-Y.; Lo, Y.-C.; Huang, W.-H. Posture monitoring for healthcare of bedridden elderly patients using 3D human skeleton analysis via a machine learning approach. *Appl. Sci.* 2022, 12, 3087.
17. Omura, Y.; Yamagami, Y.; Hirota, Y.; Nakatani, E.; Tsujimoto, T.; Inoue, T. Effectiveness of sliding sheets in repositioning care in terms of working time and subjective fatigue. *Int. J. Nurs. Stud.* 2019, 99, 103389.
18. Alamgir, H.; Yu, S.; Fast, C.; Hennessy, S.; Kidd, C.; Yassi, A. Efficiency of overhead ceiling lifts in reducing musculoskeletal injury among carers working in long-term care institutions. *Injury* 2008, 39, 570–577.
19. Hodder, J. N.; Holmes, M. W. R.; Keir, P. J. Continuous assessment of work activities and posture in long-term care nurses. *Ergonomics* 2010, 53, 1097–1107.
20. Holmes, M. W.; Hodder, J. N.; Keir, P. J. Continuous assessment of low-back loads in long-term care nurses. *Ergonomics* 2010, 53, 1108–1116.
21. Warren, G. Moving and handling: Reducing risk through assessment. *Nurs. Stand.* 2016, 30, 49–58.
22. Renjith, V.; Yesodharan, R.; Noronha, J. A.; Ladd, E.; George, A. Qualitative methods in health care research. *Int. J. Prev. Med.* 2021, 12, 20.
23. Pyo, J.; Lee, W.; Choi, E. Y.; Jang, S. G.; Ock, M. Qualitative research in healthcare: Necessity and characteristics. *J. Prev. Med. Public Health* 2023, 56(1), 12–20.
24. Burns, P.B.; Rohrich, R.J.; Chung, K.C. The levels of evidence and their role in evidence-based medicine. *Plast. Reconstr. Surg.* 2011, 128, 305–310.
25. Slawson, D. C.; Shaughnessy, A. F. Obtaining useful information from expert-based sources. *BMJ* 1997, 314, 947.
26. Kea, B.; Sun, B. C. Consensus development for healthcare professionals. *Intern. Emerg. Med.* 2015, 10, 373–383.
27. Nagavci, B.; Gáspár, Z.; Lakatos, B. Defining expert opinion in clinical guidelines: Insights from 98 scientific societies. *BMC Med. Res. Methodol.* 2025, 25, 87.
28. Bogner, A.; Littig, B.; Menz, W., Eds. *Interviewing Experts*; Springer: Berlin, Germany, 2009.
29. Yorio, P. L.; Edwards, J.; Hoeneveld, D. Safety culture across cultures. *Saf. Sci.* 2019, 120, 402–410.
30. World Medical Association. World Medical Association Declaration of Helsinki. *Bull. World Health Organ.* 2018.
31. Ormston, R.; Spencer, L.; Barnard, M.; Snape, L. The foundations of qualitative research. In *Qualitative Research Practice*, 2nd ed.; Ritchie, J., Lewis, J., McNaughton Nicholls, C., Ormston, R., Eds.; Sage Publications: London, UK, 2014; pp. 1–25.
32. Mason, J. Making convincing arguments. In *Qualitative Researching*, 2nd ed.; Sage: London, UK, 2002; pp. 173–204.
33. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* 2006, 3, 77–101.
34. Jackson, K.; Bazeley, P. *Qualitative Data Analysis with NVivo*, 3rd ed.; Sage Publications: London, UK, 2019; pp. 1–376.
35. Strauss, A.; Corbin, J. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*; Sage Publications: California, USA, 1998.
36. Ritchie, J.; Lewis, J.; McNaughton Nicolls, C.; Ormston, R., Eds. *Qualitative Research Practice: A Guide for Social Science Students and Researchers*, 2nd ed.; Sage Publications: London, UK, 2014.
37. Johnson, J. L.; Adkins, D.; Chauvin, S. A review of quality indicators of rigor in qualitative research. *Am. J. Pharm. Educ.* 2020, 84, 7120.
38. Matthews, E. E. Sleep disturbances and fatigue in critically ill patients. *AACN Adv. Crit. Care* 2011, 22, 204–224.
39. Hillman, D. R. Sleep loss in the hospitalized patient and its influence on recovery from illness and operation. *Anesth. Analg.* 2021, 132, 1314–1320.
40. Serranheira, F.; Sousa-Uva, M.; Sousa-Uva, A. Hospital nurses' tasks and work-related musculoskeletal disorder symptoms: A detailed analysis. *Work* 2015, 51, 401–409.
41. Oliver-Hernández, C.; Li, S.; Astudillo, R. J.; Rodríguez, I. M. Factors affecting musculoskeletal risk in nursing assistants and orderlies. *Work* 2023, 75, 145–155.

42. Carnahan, J.L.; Unroe, K.T. Prioritizing nursing home staff and leadership consistency to improve quality. *J. Am. Geriatr. Soc.* 2022, *70*, 2472.
43. Oliver, D. Fighting pyjama paralysis in hospital wards. *BMJ* 2017, *357*, j2096.
44. Sweeney, S.; Crowe, S.; Watson, W.; Rasmussen, B.; Wynter, K.; Holton, S. End PJ paralysis: An initiative to reduce patient functional decline. *Aust. Nurs. Midwifery J.* 2020, *27*, 28–31.
45. Honeycutt, C. F.; Perreault, E. J. Planning of ballistic movement following stroke: Insights from the startle reflex. *PLoS ONE* 2012, *7*, e43097.
46. De Baets, L.; Meulders, A.; Van Damme, S.; Caneiro, J.P.; Matheve, T. Understanding discrepancies in a person's fear of movement and avoidance behavior: A guide for musculoskeletal rehabilitation clinicians who support people with chronic musculoskeletal pain. *J. Orthop. Sports Phys. Ther.* 2023, *53*, 307–316.
47. Budarick, A.R.; Lad, U.; Fischer, S.L. Can the use of turn-assist surfaces reduce the physical burden on caregivers when performing patient turning? *Hum. Factors* 2020, *62*, 77–92.
48. Johnson, K.; Swinton, P.; Pavlova, A.; Cooper, K. Manual patient handling in the healthcare setting: A scoping review. *Physiotherapy* 2023, *120*, 60–77.
49. Graham, L.; Ellwood, A.; Hull, K.; Fisher, J.; Cundill, B.; Holland, M.; Goodwin, M.; Clarke, D.; Hawkins, R.; Hulme, C.; Patel, I.; Kelly, C.; Williams, R.; Farrin, A.; Forster, A. A posture and mobility training package for care home staff: Results of a cluster randomised controlled feasibility trial (PATCH trial). *Age & Ageing* 2020, *49*, 821–828.
50. Marfil-Gómez, R. M.; García-Mayor, S.; Morales-Asencio, J. M.; Gómez-González, A. J.; Morilla-Herrera, J. C.; Moya-Suárez, A. B.; Aranda-Gallardo, M.; Rincón-López, T.; Lupiáñez-Pérez, I. Pressure levels in the trochanter area according to repositioning at different degrees of inclination in healthy subjects. *J. Tissue Viability* 2020, *29*, 125–129.
51. Marras, W. S.; Davis, K. G.; Kirking, B. C.; Bertsche, P. K. A comprehensive analysis of low-back disorder risk and spinal loading during transferring and repositioning of patients using different techniques. *Ergonomics* 1999, *42*, 904–926.
52. Whitehead, P. J.; Rooney, L.; Adams-Thomas, J.; Bailey, C.; Greenup, M.; Southall, C.; Raffle, A.; Rapley, T.; Whittington, S. "Single-handed care" initiatives and reviews of double-handed homecare packages: A survey of practices in English local authorities. *Health Soc. Care Community* 2022, *30*, e5560–e5569.
53. Rinds, G. Manual handling in healthcare support work. *Br. J. Healthc. Assist.* 2008, *2*, 11–16.
54. Griffin, R. A missed opportunity: The NHS Long Term Workforce Plan and the support workforce. *Br. J. Healthc. Assist.* 2024, *18*, 6–10.
55. Welsh, T. J.; Gordon, A. L.; Gladman, J. R. Comprehensive geriatric assessment: A guide for the non-specialist. *Int. J. Clin. Pract.* 2014, *68*, 290–293.
56. Denholm, B. Clinical issues: Risk of injury in the lateral position. *AORN J.* 2007, *86*, 852–853.
57. Powers, J. Two methods for turning and positioning and the effect on pressure ulcer development: A comparison cohort study. *J. Wound Ostomy Continence Nurs.* 2016, *43*, 46–50.
58. Kapp, S.; Gerdtz, M.; Gefen, A.; Prematunga, R.; Santamaria, N. An observational study of the maintenance of the 30° side-lying lateral tilt position among aged care residents at risk of pressure injury using standard pillows and a purpose-designed positioning device. *Int. Wound J.* 2019, *16*, 1080–1086.
59. Hogan, D. A.; Greiner, B. A.; O'Sullivan, L. The effect of manual handling training on training transfer, behaviour change, and reduction of work-related musculoskeletal disorders: A systematic review. *Ergonomics* 2014, *57*, 93–107.
60. Wählin, C., Stigmar, K., & Nilsing Strid, E. A systematic review of work interventions to promote safe patient handling and movement in the healthcare sector. *Int. J. Occup. Saf. Ergonomics.* 2022, *28*(4), 2520–2532.
61. Health and Safety Executive (HSE). *Risk at Work: Manual Handling*; HSE: London, UK, 2022. Available online: <https://www.hse.gov.uk/toolbox/manual.htm> (accessed 2 February 2023).
62. Al-Johani, W. A., & Pascual Pascua, G. *Impacts of manual handling training and lifting devices on risks of back pain among nurses: an integrative literature review*, 2019. Available online: <http://localhost:8080/xmlui/handle/123456789/721> (accessed 2 February 2023).

63. Smith, J. E.; Simpson, P.; Fray, M., Eds. *The Guide to the Handling of People*, 7th ed.; BackCare: Hitchin, UK, 2023.
64. Wiggermann, N. Biomechanical evaluation of a bed feature to assist in turning and lateral repositioning of patients. *Hum. Factors* 2016, *58*, 748–757.
65. Hwang, J.; Kuppam, V. A.; Chodraju, S. S. R.; Chen, J.; Kim, J. H. Commercially available friction-reducing patient-transfer devices reduce biomechanical stresses on caregivers' upper extremities and low back. *Hum. Factors* 2019, *61*, 1125–1140.
66. Zhou, J.; Wiggermann, N. Effects of hospital bed features on caregiver physical stresses during patient repositioning. *Appl. Ergon.* 2021, *90*, N.PAG.
67. Engst, C.; Chhokar, R.; Miller, A.; Tate, R.B.; Yassi, A. Effectiveness of overhead lifting devices in reducing the risk of injury to care staff in extended care facilities. *Ergonomics* 2005, *48*, 187–199.
68. Ronald, L. A.; Yassi, A.; Spiegel, J.; Tate, R. B.; Tait, D.; Mozel, M. R. Effectiveness of installing overhead ceiling lifts in reducing musculoskeletal injuries in an extended care hospital unit. *AAOHN J.* 2002, *50*, 120–127.
69. The OT Practice. *The Benefits of Bed Turning Systems for Clients with Complex Physical Needs*; 2024. Available online: <https://www.theotpractice.co.uk> (accessed 18 August 2025).
70. De Meyer, D.; Van Hecke, A.; Verhaeghe, S.; Beeckman, D. PROTECT-Trial: A cluster RCT to study the effectiveness of a repositioning aid and tailored repositioning to increase repositioning compliance. *J. Adv. Nurs.* 2018, *75*, 1085–1098.
71. Jäger, M.; Jordan, C.; Theilmeier, A.; Wortmann, N.; Kuhn, S.; Nienhaus, A.; Luttmann, A. Lumbar-load analysis of manual patient-handling activities for biomechanical overload prevention among healthcare workers. *Ann. Occup. Hyg.* 2013, *57*, 528–544.
72. Weiner, C.; Kalichman, L.; Ribak, J.; Alperovitch-Najenson, D. Repositioning a passive patient in bed: Choosing an ergonomically advantageous assistive device. *Appl. Ergon.* 2017, *60*, 22–29.
73. Larson, R. E.; Murtagh, E. M.; Rice, M. S. Forces involved when sliding a patient up in bed. *Work* 2018, *59*, 439–448.
74. Alperovitch-Najenson, D.; Weiner, C.; Ribak, J.; Kalichman, L. Sliding sheet use in nursing practice: An intervention study. *Workplace Health Saf.* 2020, *68*, 171–181.
75. Pay, A. N.; Sommerich, C. M.; Lavender, S. A. Assessment of alternative methods for informal caregivers performing patient repositioning tasks. *Appl. Ergon.* 2021, *93*, N.PAG.
76. Wiggermann, N.; Zhou, J.; McGann, N. Effect of repositioning aids and patient weight on biomechanical stresses during repositioning in bed. *Hum. Factors* 2021, *63*, 565–577.
77. McGill, S. M.; Kavcic, N. S. Transfer of the horizontal patient: The effect of a friction-reducing assistive device on low-back mechanics. *Ergonomics* 2005, *48*, 915–929.
78. Fragala, G.; Fragala, M. Improving the safety of patient turning and repositioning tasks for caregivers. *Workplace Health Saf.* 2014, *62*, 268–273.
79. Clark, M.; Phillips, L.Y.N.; Knibbe, H.J.J. Lifting and transfer devices: A bridge between safe patient handling and pressure ulcer prevention. *Am. J. Safe Patient Handl. Mov.* 2015, *5*, 154–160.
80. Drew, K.E.; Kozey, J.W.; Moreside, J.M. Biomechanical evaluation and perceived exertion of a lateral patient-handling task. *Occup. Ergon.* 2016, *12*, 151–163.
81. National Institute for Health and Care Excellence. *Slide Sheets for Moving or Repositioning a Person: Late-Stage Assessment (HealthTech Guidance HTG745)*; NICE: London, UK, 2025. Available online: <https://www.nice.org.uk/guidance/htg745> (accessed 3 February 2026).
82. Baptiste, A. Technology solutions for high-risk tasks in critical care. *Crit. Care Nurs. Clin. N. Am.* 2007, *19*, 177–186.
83. Thornton, S. Ergonomics evaluation of single-handed care implementation with hoisting transfers in home care services. In *The Guide to the Handling of People*, 7th ed.; Smith, J. E., Simpson, P., Fray, M., Eds.; BackCare: Hitchin, UK, 2023; pp. 193–196.

84. The Royal Society for the Prevention of Accidents (RoSPA). *Putting people first: the benefits of training your team in single-handed/proportionate care*; RoSPA: Birmingham, UK, 2025. Available online: <https://www.rospace.com> (accessed 18 August 2025).
85. Gräf, J. K.; Argubi-Wollesen, A.; Otto, A. K.; Steinemann, N.; Mattes, K.; Wollesen, B. Differences in nurses' upper-body posture in manual patient handling: A qualitative case study. *Appl. Sci.* 2024, *14*, 2295.

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.