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Prevention of pressure ulcers from the perspective of frailty, pre-frailty, and health and social inequalities: An opinion paper

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Pressure ulcers affect many people in acute care and community settings. People with pressure ulcers may have delayed ulcer healing due to various factors, such as malnutrition and frailty. Prevention of pressure ulcers by addressing individual risk factors is essential, as it can help maintain skin integrity and functional ability, prevent or delay frailty, reduce care-associated costs, and improve quality of life [1]. There are key factors leading to both frailty and pressure ulcers but the psychosocial aspects of these factors are often overlooked. In the current literature and clinical practice, the key concepts related to the bio-psychosocial aspects of frailty and pressure ulcer prevention are under-explored and not fully considered as part of routine care services. To address this gap in research and practice, a group of experts were invited to an online panel discussion. The expert panel included academics, researchers, and specialist clinical professionals in key leadership roles such as consultant geriatricians, advanced nurse practitioners and tissue viability nurse specialists, the national lead for older person services in Ireland, and the lead person for the National Wound Care Strategy in England *(further details of all panel members are available in*

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Table 1
Academic and professional background of the panel members.

No	Academic and professional background	Country
1	Professor, nutrition researcher	Belgium
2	Professor, frailty researcher, geriatrician	Belgium
3	Professor, wound care researcher	Belgium and Sweden
4	Researcher and specialist in skin integrity	Belgium
5	Researcher in basic science with specialisation in nutrition	Belgium
6	Professor, wound care researcher	Ireland
7	Advanced nurse practitioner in older person care and frailty, public health nurse	Ireland
8	Consultant geriatrician and frailty researcher	Ireland
9	Advanced nurse practitioner and tissue viability nurse specialist	Ireland
10	Director of nursing, national lead for older person services	Ireland
11	Researcher in oral health and frailty	New Zealand
12	Associate professor, frailty and fundamentals of care researcher, director of clinical nursing, clinical nurse specialist	Sweden
13	Professor, wound care researcher	Switzerland
14	Professor, wound care researcher	Turkiye
15	Lecturer, wound care researcher and specialist	United Kingdom
16	Senior lecturer, wound care researcher and specialist	United Kingdom
17	Lead for the pressure ulcer workstream for the National Wound Care Strategy	United Kingdom

Table 1).

In March 2024, an expert panel meeting was held online with participation from experts in the areas of frailty, wound care, and nutrition to discuss key concepts of frailty and pressure ulcers. The main focus of this expert panel was to identify the connections between frailty and pressure ulcers and discuss priority areas to help address the needs of an ageing population who are at risk of developing pressure ulcers. This opinion paper presents the summary of the expert panel under a number of headings based on the focus of the panel discussions. It highlights the key concepts of frailty and pressure ulcers, discusses the bidirectional complex vicious cycle between them, and emphasises the importance of a preventative approach.

While there are many definitions and classifications of frailty in the literature, this paper aims to describe the impact of frailty on the development, treatment and prevention of pressure ulcers from the perspective of experts in wound care, older persons care and nutrition. The key focus explored in this paper is the complex interplay between frailty and pressure ulcers and the role of modifiable risk factors including nutrition, socioeconomic status, and other factors in that relationship.

1. What is frailty? Challenges with definitions and shared risk factors for frailty and pressure ulcers

Frailty is a syndrome associated with the ageing process that has a complex, multidimensional and multifactorial nature [2]. Consequently, having consensus on its definition remains challenging due to the number of different approaches to identifying frailty, which usually vary depending on the setting and population that the identification tools are intended for [3]. Some argue that there is no "state of" frailty because it is a continuum as individuals transition between robustness and frailty, mostly due to health events such as a hospital admission [4,5]. This description and a broad range of publications and operational tools to identify frailty often refer to the physical aspect of frailty [3] and to a diminished capacity to adapt to internal and external stressors [6]. Fried et al.'s [7] Physical Frailty Phenotype is the most common physical frailty assessment tool [8] and unintentional weight loss is considered as one of the contributing factors for physical frailty.

While declining intrinsic capacity [9], reduced mobility [10], and malnutrition [11] are essential factors leading to frailty, there is existing knowledge that other factors, such as functional ability, cognition, psychological factors, and social interactions should also be considered when defining frailty, emphasising its multidimensional and multifactorial aspects [2,10]. On the other hand, risk factors for pressure ulcers include but are not limited to immobility, age (being over 70), incontinence, undernutrition and dehydration, obesity, diseases impacting

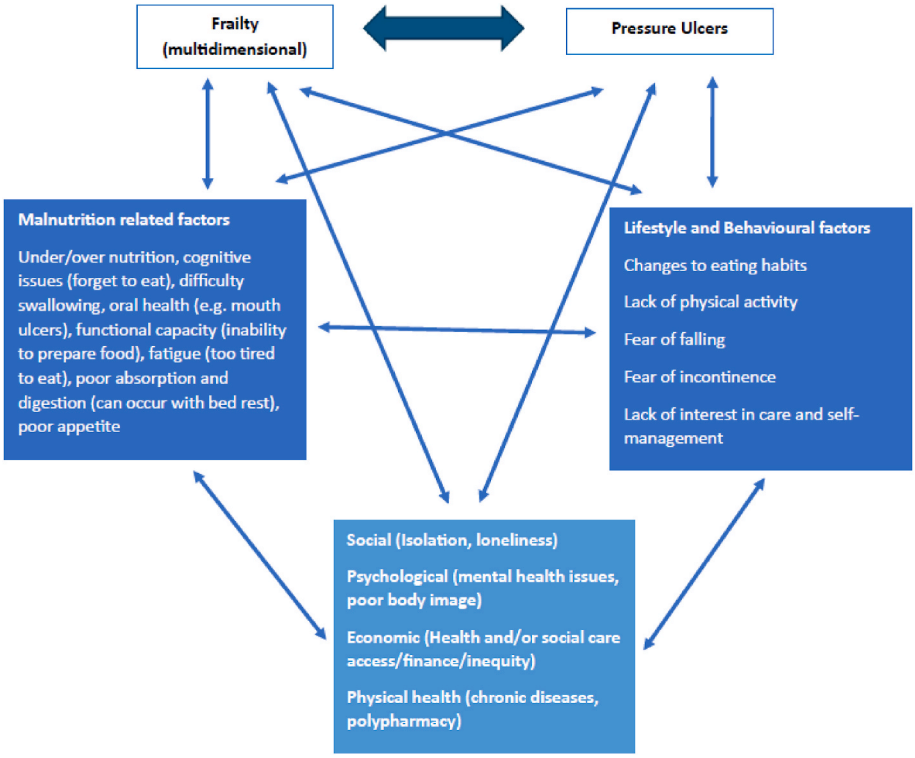


Fig. 1. Conceptual map of the association between frailty, pressure ulcers and modifiable factors.

blood flow (such as diabetes and vascular disease), and sensory disruptions (including neurological disorders and spinal cord injuries) [12]. It is evident that frailty and pressure ulcers have shared risk factors (Fig. 1), which should be considered as part of a holistic and person-centred approach for the purposes of assessment.

Some frailty screening tools, such as the deficit accumulation indexes or Frailty Indexes consider pressure ulcers or chronic wounds as a contributing factor for frailty [8,13]. Conversely, frailty may be a factor leading to the development of chronic wounds due to reduced tissue integrity, skin failure, lack of mobility, and increased risk of falls [14], and it may be associated with wound healing progress and healing times [15]. It is difficult to differentiate between the factors contributing to the development of frailty and pressure ulcers, and the outcomes of underlying issues. This challenge is caused by a cyclic pattern whereby a factor can both be contributing to or caused by frailty, and the same applies to pressure ulcers. A preventative approach to address risk factors for both frailty and pressure ulcers will therefore be more beneficial for the at-risk population considering the shared nature of these factors.

2. A risk state: pre-frailty and how it compares to skin's decreased tolerance to risk factors

There are overlapping factors that could contribute to the prevention of frailty and pressure ulcers in older adults. A prodromal state of frailty, also known as pre-frailty, refers to a decreased capacity to withstand stressors that may lead to the development of frailty [16]. Like frailty, there is no accepted definition of pre-frailty; it is typically described by deficits on a frailty screening or classification instrument that do not reach the threshold for frailty but are not consistent with being non-frail or robust [17]. From the point of pressure ulcers, this could be described as similar to the skin's decreased tolerance to risk factors. Both pre-frailty and skin's decreased tolerance to risk factors have important roles in adverse outcomes, such as the development of frailty from the context of pre-frailty and the occurrence of pressure ulcers from the point of skin's decreased tolerance to risk factors.

Frailty is a dynamic state [18] or a continuum [4] that is influenced by a stressor [2] and individuals fluctuate between different states of robustness, pre-frailty and frailty [4]. Since pre-frailty occurs before the onset of established frailty and it may be reversible [19], pre-frailty has become a target for multi-domain interventions in community-dwelling older adults [17,20,21]. Therefore, prevention of frailty is possible by early identification and timely management of stressors that may push pre-frail individuals towards the development of frailty.

Likewise in pressure ulcers, changes in the skin tone, sensation or temperature indicate a "pre-frail" state of the skin where early intervention makes a significant difference to ultimate outcomes. These changes in the skin tone, sensation or temperature refer to a risk state, or a transition phase with warning signs that should be acted upon immediately by addressing underlying causes [1,22], which are often modifiable. In other words, it is at this vulnerable juncture that targeted interventions may prevent the development of a pressure ulcer. In this perspective, pre-frailty and changes in the skin tone, sensation or temperature could symbolise a similar state. If we translate this example to pre-frailty, it could be possible to identify this risk state for frailty and progression towards frailty and implement individualised interventions to prevent it [10,23–26]. However, interventions can prove to be intricate due to the presence of multiple underlying issues.

3. Why prevention approach is important?

Management of risk factors at the pre-frail stage is essential, as established frailty brings challenges to the treatment of pressure ulcers and tissue repair processes [15]. For example, it has been observed in the clinical practice that frailty in people with pressure ulcers is considered as a reason for not performing surgical repair of the ulcers. While frailty is seen as a complicating factor for pressure ulcer development [27] and treatment, it is difficult to identify the relationship between established frailty and a pressure ulcer since it is not always clear which determinants are assessed in clinical practice. It is also challenging to highlight one specific intervention that can relate to both frailty and pressure ulcers when they form a bidirectional vicious cycle.

We recommend a preventive approach because frailty often co-occurs with fatigue, muscle loss, weakness [7], poor social connections [28], cognitive issues [2], and other challenges. This combination of bio-psychosocial factors presents challenges for the planning and delivery of targeted interventions to reverse these factors. Therefore, we suggest that a preventative approach in this context starts with careful consideration of the complex nature of the mechanisms leading to frailty and pressure ulcers, including the contribution of bio-psychosocial factors. This will help in planning and delivering holistic and person-centred assessment and care. Having the awareness of "what makes people pre-frail?" and "what pushes people over the edge?" and the factors specific to a person are important considerations for researchers and clinicians when targeting prevention of frailty and pressure ulcers in high-risk populations. There might be challenges to this in the clinical practice due to limited competence and resources in healthcare settings. However, it is more important than ever to identify strategies and approaches to deliver early prevention efforts.

When targeting prevention, it is essential to consider the multidimensional and multifactorial nature of frailty. Fig. 1 illustrates the concept and association between frailty and pressure ulcers, providing examples of shared modifiable and non-modifiable factors influencing this relationship. However, targeting individual factors, rather than adopting a broad approach to frailty may be prioritised in certain high-risk populations.

4. Modifiable factors

Modifiable factors represent the factors that can be addressed with certain interventions [29]. While some factors, such as ageing, are the non-modifiable factors that contribute to the development of frailty and put people with pressure ulcers at greater risk [2,27,30], other factors such as nutritional status [10,11,27] and oral health [24,25], mobility and independence levels [10,23,26,31], polypharmacy [27,32], lifestyle factors including patient involvement in prevention efforts [33], and some social and lifestyle factors are potentially modified with timely interventions. However, the potential for modification should be interpreted with caution as there might be additional underlying issues and comorbidities that contribute to adverse outcomes. In some cases, while prevention of pressure ulcers can be possible, progression to frailty may not be preventable. Nonetheless, the extensive literature evidence base on the contribution of modifiable factors to the multifactorial development processes of frailty and pressure ulcers highlights the need to consider them in prevention efforts [2,27,30].

5. Social and health inequalities in frailty and pressure ulcer prevention

While the existing literature focuses widely on the physical factors leading to the development of frailty and pressure ulcers, social factors, lifestyle, and mental health are often overlooked in relation to prevention and management strategies [34,35]. In reality, many of the physical risk factors could be connected to limited access to healthcare due to financial reasons, mental health issues, social isolation, or limited health literacy. Social isolation is associated with the social aspect of frailty, and it is closely related to mental health issues such as depression [28]. Furthermore, social frailty, defined by Bunt et al. [36] as *"a progressive state of being vulnerable to the loss or deprivation of resources that are necessary to fulfill one's basic social needs throughout life"* [37], is linked with low physical activity levels [28] and frailty [38], which contribute to the development of pressure ulcers.

Social and health inequalities are disregarded factors in the

Box 1
A summary of the key points and recommendations

- ❖ We recommend a preventive approach because established frailty brings challenges to the treatment of pressure ulcers and tissue repair processes.
- ❖ A preventative approach in this context starts with careful consideration of the complex nature of the mechanisms leading to frailty and pressure ulcers, including the contribution of the bio-psychosocial factors.
- ❖ Having the awareness of "what makes people pre-frail?" and "what pushes people over the edge?" and the factors specific to a person are important considerations when targeting prevention of frailty and pressure ulcers in high-risk populations. We recommend that all healthcare professionals who work with older adults should complete a frailty education programme to have a good understanding of the bio-psychosocial aspects of frailty.
- ❖ Early identification and management of modifiable risk factors are essential in prevention efforts. However, although some factors leading to frailty and pressure ulcers are modifiable, some are not due to additional underlying issues and comorbidities. The researchers and clinicians should take into account that in some cases, while prevention of pressure ulcers can be possible, progression to frailty may not be prevented.
- ❖ It is important to consider the multidimensional and multifactorial nature of frailty. Targeting individual factors, rather than adopting a broad approach to frailty may be prioritised in certain high-risk populations.
- ❖ Frailty, pre-frailty, and health and social inequality concepts should be mentioned in regional, national, and international guidelines. Their impact on key physiological and biomechanical components, including internal strains, stress, and damage thresholds, should be more clearly recognised. These factors affect mechanical boundary conditions (e.g., mobility impacting the amount and duration of pressure, shearing, friction) and individual susceptibility and tolerance (physiology, repair, thermal properties, transport). The connections should be more clearly outlined in the guidelines to raise awareness.
- ❖ More large-scale interdisciplinary intervention research to address frailty, pre-frailty, and health and social inequalities should be funded and executed in collaboration to prevent individuals from developing pressure ulcers and break the cycle of deterioration.

prevention of frailty and pressure ulcers. For example, malnutrition is widely cited as a risk factor for both frailty and pressure ulcers yet underlying issues for under and overnutrition are often not fully explored considering the individual's circumstances [39]. Being able to afford and access healthy food, having the cognitive and sensory capacity to recognise and access food, appetite and ability to eat (e.g. dysphagia), or enjoying mealtimes with accompanying persons around older adults are rarely considered. The observations from the experts participating in the panel highlighted connections between multiple social and health inequalities-related factors potentially contributing to frailty and pressure ulcers, such as a lack of desire to eat when having to stay in bed, moving less due to high body weight because of lack of access to healthy food, eating or drinking less due to fear of incontinence or inability to afford continence wear on a daily basis. This is very concerning because it is a well-known fact that inadequate access to health and social care services could directly and indirectly lead to poor physical and mental health [40].

6. Conclusions

Based on the discussions presented, a summary of the key points and recommendations is available in Box 1. We recommend better consideration and prioritising of a prevention approach for frailty and pressure ulcers in high-risk populations. This is also more achievable considering the increasing older adult population with complex health and social issues and limited resources in health and social care. While we discuss the physical factors contributing to the development of frailty and pressure ulcers, we wish to bring attention to often overlooked social factors and inequalities, as these should be part of a holistic and person-centred assessment and care approach for older adults.

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Declaration of competing interest

No conflict of interest has been declared by the authors.

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