*Physiotherapy*

Identifying Barriers and Facilitators to Participation in Pressure Ulcer Prevention in Allied Healthcare Professionals: A mixed methods evaluation.

Peter R Worsley1, Paul Clarkson1, Dan L Bader1, Lisette Schoonhoven1,2

1 Faculty of Health Sciences, University of Southampton, Southampton UK.

2 NIHR CLAHRC Wessex, UK.

Corresponding author;

Peter Worsley p.r.worsley@soton.ac.uk

Faculty of Health Sciences, Mail Point 11, Southampton General Hospital, Southampton, SO16 6YD

Tel: 02380 794106

Word Count: 3378

**Abstract**

***Objectives***: To evaluate the barriers and facilitators for allied health professional’s participation in pressure ulcer prevention.

***Design***: Mixed method cohort study.

***Setting***: Single Centre study in an acute university hospital trust

***Participants***: Five physiotherapists and four occupational therapists were recruited from the hospital trust. Therapists had been working in the National Health Service (NHS) for a minimum of one year.

***Main outcome measures***: Therapist views and experiences were collated using an audio recorded focus group. This recording was analysed using constant comparison analysis. Secondary outcomes included assessment of attitudes and knowledge of pressure ulcer prevention using questionnaires.

***Results***: Key themes surrounding barriers to participation in pressure ulcer prevention included resources (staffing and equipment), education and professional boundaries. Fewer facilitators were described, with new training opportunities and communication being highlighted. Results from the questionnaires showed the therapists had a positive attitude towards pressure ulcer prevention with a median score of 81% (range 50-83%). However, there were gaps in knowledge with a median score of 69% (range 50-77%).

***Conclusions***: The therapist reported several barriers to pressure ulcer prevention and few facilitators. The primary barriers were resources, equipment and education. Attitudes and knowledge in AHPs were comparable to data previously reported from experienced nursing staff.

**1. Introduction**

Pressure ulcers (PUs) are localised areas of injury to skin and/or underlying tissue, commonly occurring adjacent to bony prominences [[1](#_ENREF_1)] . PUs represent a disabling long term condition that has been universally recognised as both a Patient Safety and Quality of Care indicator for individuals in both hospital and community settings [[2](#_ENREF_2)]. Despite the increased recent attention within the health services, their incidence rate remains unacceptably high with associated treatment costs estimated at between £1.4 – 3.1 billion per annum [[3](#_ENREF_3), [4](#_ENREF_4)] in the UK. Pressure ulcers also have a negative impact on patient’s rehabilitation and quality of life [[5-7](#_ENREF_5)].

The National Institute for Health and Care Excellence (NICE) in collaboration with the Royal College of Nursing (RCN) developed clinical guidelines for the prevention and management of pressure ulcers [[8](#_ENREF_8)]. While referring to ‘health care professionals’ in the guidelines, nursing is the profession predominantly targeted, particularly when referring to ‘trained healthcare professionals’ undertaking risk assessment. However, other allied health professions (AHPs), such as physiotherapists and occupational therapist clearly have a role within pressure ulcer prevention and management [[9](#_ENREF_9)]. Although it does not typically represent the primary aim of the therapy delivered by AHPs, rehabilitation techniques such as positioning, mobilisation and equipment provision will inevitably influence the risk of pressure ulcer development.

 Several studies suggest that to achieve success in pressure ulcer prevention, all the members of the multidisciplinary team are needed, as no one profession has all the required skills [[10](#_ENREF_10), [11](#_ENREF_11)]. It is perceived that AHPs, who largely remain uninvolved in pressure ulcer prevention are a major untapped resource with great potential to contribute to this clinical challenge. Indeed, multidisciplinary teams designed to prevent pressure ulcers have previously been successfully implemented in specialist areas of care e.g. spinal cord injury [[12](#_ENREF_12)]. However, there is a perception that this is not widely reflected in practice both in the acute and community settings. Research is needed to determine the most effective techniques to promote interdisciplinary knowledge sharing and long-term implementation of multidisciplinary teams into routine practice [[13](#_ENREF_13)].

 Accordingly the study was designed to establish the views of AHPs regarding their participation in pressure ulcer prevention, specifically focusing on barriers and facilitators to practice. In addition the study examined their current knowledge and attitudes towards pressure ulcer prevention.

**2. Methods**

A convenience sample of five physiotherapists and four occupational therapists were recruited from a large acute hospital trust in England via poster advertisement. These healthcare professionals had a range of clinical experience and expertise, including intensive care, surgery and rehabilitation for the elderly. Prior to the study NHS Research Ethical approval was obtained and informed consent was documented from each of the participants.

***2.1 Focus Group***

# A focus group was used to explore potential barriers to AHP participation in pressure ulcer prevention and where improvements could be made. An audio recorded semi-structured focus group was conducted over a one hour period in a local research facility. A topic guide was formulated by the lead researchers (PW and LS) and pilot tested with a senior physiotherapist. All participants recruited took part in the focus group, with this number chosen to ensure there were sufficient participants to yield diversity in information provided, whilst ensuring that participants are in a environment where they feel comfortable to share their thoughts, opinions, beliefs and experiences [[14](#_ENREF_14)]. The focus group had a moderator team, with one experienced researcher facilitating the discussion (LS) and the other researcher taking notes (PW), creating an environment that is conducive for group discussion and providing verification of data through note taking [[15](#_ENREF_15)].

***2.2 Attitudes and Knowledge questionnaire***

Questionnaires were used to assess attitudes and knowledge towards pressure ulcer prevention. Both questionnaires have been previously shown to have construct validity and reliability when assessing attitudes and knowledge in nurse clinicians. The attitude assessment consisted of a 13 item questionnaire exploring five key themes of pressure ulcer prevention [[16](#_ENREF_16)]. The knowledge assessment consisted of 26 items in six key themes [[17](#_ENREF_17)]. Although both these instruments were designed to assess nursing practitioners, they include key themes which are applicable to AHPs.

***2.3 Analysis***

In order to analyse the focus group data a constant comparison analysis was used [[18](#_ENREF_18)]. The focus group recording was transcribed verbatim. This transcription and the observational notes were coded independently by three researchers (PW, LS, PC). This coding process was carried out by reading each of the documents to attribute a code to sentences, paragraphs, or sections. Codes that related to the same phenomenon were grouped into categories and finally themes were identified. Categories and themes were discussed and consensus was reached between the researchers. Codes were stored with the relevant sections of the notes in electronic form (Excel, Microsoft).

Data from the questionnaires was collated and descriptive statistics were calculated (median and inter-quartile range) appropriate for the small sample size being assessed. The sub-sections of each questionnaires were analysed to observe trends in the themes topics of the two evaluations.

**3. Results**

The participants recruited included two males and seven females aged between 24-57 years old. The sample included junior therapists through to senior management staff across both physiotherapy and occupational therapy teams.

Focus group analysis resulted in an identification of 11 categories, from which four themes emerged (Table 1). Within the focus group a number of barriers to pressure ulcer prevention were identified, while description of facilitators was limited.

|  |
| --- |
| Table 1: Barriers to pressure ulcer preventive practice |
| **Barriers** |
| **Theme** | **Sub-theme** |
| **Resources** | ***Equipment provision*** – Having access to appropriate equipment |
| ***Staffing*** – sufficient staff to provide pressure ulcer prevention strategies |
| ***Financial*** – Cost pressures impacting on preventative practice. |
| **Education and** **Background Knowledge** | ***Pre-registration training*** – Lack of training and awareness  |
| ***Knowledge surrounding Equipment*** – Lack of education regarding specific pressure ulcer prevention equipment |
| **Professional Identities** | ***Perceived role of differing professional groups*** – Perception of therapy and nursing role and responsibility***Documentation and communication*** - Lack of communication amongst the multidisciplinary team and management ***Prioritisation in practice*** – Having other duties as a therapist which may take priority over pressure ulcer prevention,  |
| **Implementing Care** | ***Delays in treatment*** – Decision on acquired location of PU before treatment, delays in equipment provision in hospital and at discharge***Boundaries of practice*** - Disparity between community and hospital approaches ***Feasibility of MDT working in hospital environment*** – Barriers to MDT working – lack of staff, time, logistical issues, profession specific working |
| **Facilitators** |
| **Education and Background Knowledge** | ***Desire of therapy staff to gain greater knowledge***  |
| **Professional Identities** | ***Belief that prevention is part of role and responsibility of therapy staff*** |
|  |  |

 ***3.1 Theme 1: Resource issues that act as barriers to multidisciplinary practice***

Three categories were identified in this theme: (1) equipment provision – access to appropriate equipment; (2) staffing – having sufficient staff to provide preventative strategies; (3) Financial – cost pressures impacting the provision of preventative measures.

*3.1.1 Equipment provision – access to appropriate equipment*

The participants identified a lack of specific types of equipment to provide effective prevention, in particular to elevate a patient’s heels and to alleviate the risk associated with medical devices. As an example, one participant highlighted,

‘*when you have oxygen masks going over the ears and they get pressure areas there is nothing we can do other than put bits of gauze of something in there to stop that, but that's not necessarily solving the problem’*

(P1)

Participants also identified logistical issues such as a lack of access to the hospital ordering system and communication difficulties with nurses or health care support workers.

*3.1.2 Staffing –sufficient staff to provide preventive strategies*

A lack of staffing was highlighted by participants as a barrier to pressure ulcer prevention, while also impacting on the patient’s rehabilitation. An example was provided whereby therapists had been asked to limit the number of patients who sit out of bed in their hospital wards because of limited resources to get these patients back into bed again. One participant stated,

‘*we have been approached recently to request not to sit patients out, um, because they don't have the resources to get them back into bed and they are sitting out for lengthy periods of time’*

(P3)

Therapists further indicated that a lack of expertise on both their part and that of the ward nursing staff meant that the expertise of tissue viability nurses was sought. This was suggested as a barrier to PU prevention as these specialist nurses were not always available to answer queries.

*3.1.3 Financial – cost pressures impacting the provision of preventative practice*

Therapists indicated financial pressures, particularly during discharge, as a barrier to PU prevention. This was most often in the area of equipment provision, with one therapist indicating,

‘*trying to influence sending them (patient) home with pressure relieving cushions and um I got my knuckles wrapped because I was told there was over-prescribing’*

(P2)

Participants felt that obtaining equipment was much easier for community staff, with the community teams being better equipped for PU prevention and management.

 **3.2 Theme 2: Education and background knowledge to achieve effective PU prevention/management**

Two categories were identified in this theme: (1) Pre- and post-registration training; (2) Knowledge surrounding equipment provision.

*3.2.1 Pre- and post-registration training*

When asked if therapists acquire knowledge related to pressure ulcer prevention as part of their basic education all participants replied “no”. Indeed all participants reported that they had not received any mandatory training in this area when starting work in the National Health Service (NHS). Therapists suggested that knowledge was variable amongst the therapy workforce and dependent on previous experiences, with a participant highlighting,

‘*with reference to our knowledge base…I think it’s patchy at best’*

(P1).

The high turnover of staff was suggested as a barrier to developing peer-to-peer education.

*3.2.2 Knowledge surrounding equipment provision*

The therapists reported that there is significant ambiguity in defining decision makers for equipment provision. One participant said,

*‘it’s a discussion between you and the nurse and I don't really know where the expertise lie and there’s often times if there’s no definitive answer that patient will then stay in bed’*

(P9)

In addition, participants appeared to contradict themselves in terms of understanding effective measures for prevention. While indicating the need for a holistic approach that takes into account individual needs, there was also a desire for a more prescriptive approach. One participant said*,*

*‘ it’s just dawned on me that there’s actually people ordering and having the responsibility to order this kit and they don't have the clinical reasoning behind it* ‘

(P1)

 **3.3 Theme 3: Professional identities**

Three categories were identified in this theme: (1) Perceived role of differing professional groups; (2) Documentation and communication; (3) Prioritisation in practice.

*3.3.1 Perceived role of differing professional groups*

Therapists generally felt that they had a role and responsibility in the prevention of PUs, but not in their management. However, this was dependent on clinical area and patient group and not seen as one of their main responsibilities*.* For example a participant commented that,

‘*as far as my involvement goes I just highlight it and let the nurses know and then it stops there really for me’*

 (P3)

 Participants also felt that there was a division in terms of the provision of equipment for prevention, indicating that while mattresses and cushions were the domain of the nurse, therapists were more involved in the prevention of device related ulceration from oxygen masks and neck collars. The therapists also highlighted that PU prevention strategies implemented by the hospital trust do not involve the therapists,

‘*I felt like we didn't have much of a role in it [trust strategies] was very much the nursing staff that filled in all the documentation’*

(P2)

*3.3.2 Documentation and communication*

Lack of communication was found to be a barrier to inter-professional working in the area of PU prevention. Therapists felt that they would discuss pressure ulcer prevention during a routine handover. This was associated with a lack of knowledge in this area to be able to have an informed conversation with nurses, with a participant highlighting,

‘*I imagine those discussion [with nursing] kind of depend on the knowledge of the person involved, because they clearly have a bit more knowledge than potentially I would, I don't think I would have the confidence to have that kind of a conversation’*

(P8)

Time and staffing issues were also highlighted as a reason for a lack of multidisciplinary meetings.

*3.3.3 Prioritisation in practice*

Therapists felt that on general wards PU prevention/management was not their top priority, one participant commented,

‘*I wouldn't say it’s at the forefront of our minds when we go to see a patient because it’s not very widely advertised’*

 (P5)

Participants also highlighted the great number of other competing demands on their time that inevitably take priority.

**3.4 Theme 4: Implementing care**

Three categories were identified in this theme: (1) Delays in treatment; (2) Boundaries of practice – disparities between acute and community approaches; (3) Feasibility of multidisciplinary working in a hospital environment.

*3.4.1 Delays in prevention/treatment*

Participants highlighted that in some instances, when a PU is identified, delays in treatment occur due to the need to first identify the acquired location, i.e. community or hospital. These discussions appear to delay PU management with one participant commenting,

‘*there’s quite a lot of discussion about where the ulcer was acquired… which establishment acute or community the ulcer was first identified … it takes a long time to get over that discussion to start working with that patient on the management of their pressure ulcer* ‘

(P1)

*3.4.2 Boundaries of practice setting*

Disparities were reported by therapists between PU practice in the hospital environment and community healthcare environment. One participant felt that equipment was inappropriately prescribed in the hospital environment,

‘*there is also the disparity between the acute and community approach to the management of pressure care, in my mind, in the sense that, um, we overprescribe…and in the community they much more closely monitor how the patient’s skin reacts to what they are placed on’*

(P1)

*3.4.3 Feasibility of multidisciplinary working in a hospital environment*

The lack of multidisciplinary working was highlighted by participants, with a number of reasons suggested for this. Lack of time and staff were suggested as barriers to collaborative practice as well as working within profession specific roles and an absence of holistic patient assessment. A participant commented that,

‘*there are so many teams which cover so many patients…they can’t possibly [have] a doctor and a therapist and a nurse there at one moment in time to talk about patients…it’s not necessarily going to be feasible* ‘

(P5)

**3.5 Evaluation of attitudes and knowledge**

The attitude questionnaire revealed that AHPs had a median score of 81%, showing that the therapists had a very strong attitude towards the importance of pressure ulcer prevention (Table 2). Upper and lower quartile ranges did not vary significantly from the median score showing reasonable consistency across the therapists. Scores across each theme varied, ranging between 50-83% of the total score available. Attitudes regarding responsibility and confidence were lower (median = 50-58%) than that of priority and impact (both median = 83%).

Table 2. Results from the questionnaire of pressure ulcer prevention attitudes.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Theme** | **Competence (max=12)** | **Priority (max=12)** | **Impact (max=12)** | **Responsibility (max=8)** | **Confidence (max=8)** | **Total (max=52)** |
| Median | 8 | 10 | 10 | 6 | 7 | 42 |
| IQR1 | 7 | 10 | 9.5 | 5.5 | 6 | 39.5 |
| IQR3 | 8.5 | 11.5 | 10.5 | 6.5 | 7.5 | 43.5 |
| Min | 6 | 9 | 9 | 4 | 6 | 36 |
| Max | 10 | 12 | 12 | 8 | 8 | 46 |

Table 3 reveals the results from knowledge questionnaire. The AHPs showed that median results from the themes of aetiology, classification and nutrition were the highest (67-100% correct). Themes surrounding risk assessment and prevention were lower (43-60% correct). The median total score of 18/26 (69% correct) varied between the therapists (range 50-77% correct answers).

Table 3. Results from the questionnaire of pressure ulcer prevention knowledge.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Theme** | **Aetiology max=6** | **Classification max=5** | **Risk Ax. max=2** | **Nutrition max= 1** | **Prev. 1 max=7** | **Prev. 2 max=5** | **Total max=26** |
| Median | 4 | 4 | 1 | 1 | 3 | 3 | 18 |
| IQR1 | 4 | 3 | 1 | 1 | 2.5 | 3 | 15 |
| IQR3 | 5 | 4 | 2 | 1 | 4 | 4.5 | 19.5 |
| Min | 3 | 2 | 1 | 1 | 2 | 2 | 13 |
| Max | 6 | 4 | 2 | 1 | 5 | 5 | 20 |

**4. Discussion**

The present study has shown that AHPs working in the acute hospital setting have identified a number of barriers to participating in pressure ulcer prevention. The analysis of the focus group reveal four key themes, namely, (1) Resource issues that act as barriers to multidisciplinary practice (2) Education and background knowledge to achieve effective PU prevention/management (3) Professional identities and (4) Implementation of care. Therapist highlighted their lack of both training and awareness of available PU prevention strategies. These points were raised despite the AHPs scoring highly in the psychometric evaluation of attitudes and knowledge of pressure ulcer prevention. Further research is needed to establish AHPs role in PU prevention and what strategies health care providers can use to provide a multidisciplinary approach.

In a similar study conducted with nurses, [Samuriwo [19]](#_ENREF_19) found that although physiotherapists were involved in some aspects of preventive care, the overall responsibility was still considered to lie with the nursing profession. Nurses were suggested to be “grateful for the help they received…” rather than expecting physiotherapists to have joint responsibility for preventive care. These findings are in direct opposition to guidelines from the National Institute for Health and Care Excellence [[8](#_ENREF_8)] that promote prevention as ‘the joint responsibility of all healthcare professionals’. Role definition also was shown to be a prominent barrier to pressure ulcer prevention. Feedback from the focus group revealed that although AHPs consider pressure ulcer prevention to be important it is not one of their primary roles with competing demands on their clinical expertise. Interestingly a recent study by Sving et al (2012) have shown that some registered nurses (RNs) do not feel like it is there primary task either, with them referring the prevention to healthcare assistants (HCA) [[20](#_ENREF_20)].

A lack of basic education was a common theme within the present study, which has also been shown in qualitative research conducted with nurses [[21](#_ENREF_21)]. Following the development of the pressure ulcer prevention knowledge questionnaire [[16](#_ENREF_16)], several studies have evaluated nurses in a variety of practice settings. Inadequate nursing staff knowledge was shown in Belgium [[22](#_ENREF_22)], Jordan [[23](#_ENREF_23)] and Sweden [[24](#_ENREF_24)]. Indeed, previous studies utilising the knowledge questionnaire revealed senior nurses to range between 54-59%, tissue viability nurses 58% and nursing home nurses 29% correct answers [[22](#_ENREF_22), [25](#_ENREF_25), [26](#_ENREF_26)]. In the present study the AHPs scored between 50-77%, with a median of 69% correct answers. This would indicate a strong level of knowledge in relation to nurses who have previously been studied. However, the findings of the focus group suggest that therapist often feeling under trained and lacking knowledge to compared to experienced nursing staff.

 The present study revealed AHPS have positive attitudes with regards to priority, impact and confidence in PU prevention, although they had lower scores in confidence and responsibility. Therapists unanimously believed that nursing had the main responsibility regarding PU prevention. In two previous Australian studies occupational therapists reported a lack of confidence to provide collaborative practice with nurses [[27](#_ENREF_27), [28](#_ENREF_28)]. Unsurprisingly, literature evaluating nursing attitudes has shown greatest belief in responsibility (Therapists = 50% vs. Nurses = 83%) and competency (Therapists = 67% vs. Nurses = 78%) compared to AHPs [[22](#_ENREF_22)]. One area in which therapist did feel confident to provide expertise was in the prevention of medical device related pressure ulcers (MDRPUs). There is a growing awareness of the high incidence of MDRPUs [[29](#_ENREF_29)], therapists with knowledge of device application and repositioning could provide much needed expertise to lower this incidence and provide education to the MDT.

 Present findings indicate that staffing limitations both in numbers and expertise hindered the provision of PU prevention. It was highlighted that day-to-day decisions were directed towards a limited number of tissue viability specialists. The inevitable delay in clinical expertise, coupled with the lack of staff reportedly available to transfer patients from bed to chair, could potentially put patients at risk. It is well established that prolonged sitting can increase the risk of pressure ulcers [[30](#_ENREF_30)], the therapist and other clinicians may have been trying to minimise this risk. However, the health benefits to regular mobility are very apparent {Warburton, 2006 #4525}; reducing bed to chair transfers may have other negative effects on patients wellbeing. These comments come in the light of recent published guidelines highlighting safe staffing levels on adults wards in acute hospitals [[31](#_ENREF_31)] and reports of poor care quality within the National Health Service [[32](#_ENREF_32)]. The concerns raised by the therapy staff in the present study highlight the need for safe staffing levels to be assessed across the MDT and not just on a profession specific basis.

This present study had a number of limitations, primarily relating to the small cohort of AHPs from an acute university hospital trust. This implies that these results cannot be generalised across the AHP profession. In addition, no nurses from the trust were assessed to provide a direct comparison of the findings from the focus group and questionnaire data. Further research is also needed to investigate roles of other healthcare professionals, such as dieticians, podiatrists and medical doctors.

 Internationally recognised PU prevention strategies can be linked back to the daily practice of both physiotherapy and occupational therapy, for example patient positioning and frequency of mobility [[9](#_ENREF_9), [33](#_ENREF_33)]. An understanding of barriers and facilitators to practice within a social, organisational and economic context has been suggested to be important before the development of strategies for change and improvement in practice [[34](#_ENREF_34)]. The present study has shown that AHPs have knowledge and are willing to contribute to PU prevention and strategies are required to reduce the barriers to MDT practice.

**5. Conclusion**

This study has revealed barriers and potential facilitators to a therapeutic approach to pressure ulcer prevention in a hospital setting. The barriers to practice highlighted in this study included staff and equipment resource issues, a lack of education and background knowledge and role definition. Although therapists revealed that they have a relatively high level of knowledge regarding pressure ulcer prevention, their attitudes and beliefs regarding its place within their role ranked lower than that reported in nurses. Further research is required to establish how AHPs can contribute to a MDT approach to pressure ulcer prevention both in the acute and community healthcare settings.

**Acknowledgements**

We would like to acknowledge and thank all the participants in this study.

**Ethical Approval**

Ethical approval was obtained from the University of Southampton (UOS-FOHS-5461).

**Funding**

This study was not externally funded.

**Conflicts of Interest**

There are no conflicts of interest for this study.

**References**

[1] (EPUAP) EPUAPaNPUAP. Treatment of pressure ulcers: Quick Reference Guide. Washington DC2009.

[2] Farquhar M. AHRQ Quality Indicators. In: Clancy C, Lavizzo-Mourey R, editors. Patient Safety and Quality: An Evidence-Based Handbook for Nurses Rockville (MD)2008.

[3] Dealey C, Posnett J, Walker A. The cost of pressure ulcers in the United Kingdom. Journal of Wound Care. 2012;21:261-4.

[4] Posnett J, Franks P. The burden of chronic wounds in the UK. Nursing Times. 2008;104:44-5.

[5] Moore Z, Cowman S. Quality of life and pressure ulcers: a literature review. Wounds UK. 2009;5:58-, 60, 2 passim.

[6] Spilsbury K, Nelson A, Cullum N, Iglesias C, Nixon J, Mason S. Pressure ulcers and their treatment and effects on quality of life: hospital inpatient perspectives. Journal of Advanced Nursing. 2007;57:494-504.

[7] Nogueira P, Caliri M, Haas V. Profile of patients with spinal cord injuries and occurrence of pressure ulcer at a university hospital. Latino-Am Enfermagem. 2006;14:372-7.

[8] National Institute for Health and Care Excellence NICE, RCN RCoN. Pressure ulcers: prevention and management of pressure ulcers NICE Guideline CG 1792014.

[9] Guihan M, Hastings J, Garber SL. Therapists' role in pressure ulcer management in persons with spinal cord injury. Journal of Spinal Cord Medicine. 2009;32:560-7.

[10] Gottrup F, Holstein P, Jorgensen B, Lohmann M, Karlsmar T. A New Concept of a Multidisciplinery Wound Healing Center and a National Expert Function of Wound Healing. Arch Surg. 2001;136:765-72.

[11] McCulloch JM. The role of physiotherapy in managing patients with wounds. J Wound Care. 1998;7:241-4.

[12] Coggrave MJ, Rose LS. A specialist seating assessment clinic: changing pressure relief practice. Spinal Cord. 2003;41:692-5.

[13] Henzel MK, Bogie KM, Guihan M, Ho CH. Pressure ulcer management and research priorities for patients with spinal cord injury: consensus opinion from SCI QUERI Expert Panel on Pressure Ulcer Research Implementation. J Rehabil Res Dev. 2011;48:xi-xxxii.

[14] Onwuegbuzie A, Dickinson W, Leech N, Zoran A. A Qualitative Framework for Collecting and Analyzing Data in Focus Group Research. International Journal of Qualitative Methods. 2009;8:1-21.

[15] Krueger R, Casey MA. Focus Groups. A Practical Guide for Applied Research. Third ed: Sage; 2000.

[16] Beeckman D, Defloor T, Demarre L, Van Hecke A, Vanderwee K. Pressure ulcers: Development and psychometric evaluation of the Attitude towards Pressure ulcer Prevention instrument (APuP). Int J Nurs Stud. 2010;47:1432-41.

[17] Beeckman D, Vanderwee K, Demarre L, Paquay L, Van Hecke A, Defloor T. Pressure ulcer prevention: Development and psychometric validation of a knowledge assessment instrument. Int J Nurs Stud. 2010;47:399-410.

[18] Glaser B. The Constant Comparative Method of Qualitative Analysis. Soc Probl. 1965;12:436-45.

[19] Samuriwo R. Pressure ulcer prevention: the role of the multidisciplinary team. British Journal of Nursing. 2012:S4-s13.

[20] Sving E, Gunningberg L, Högman M, Mamhidir A-G. Registered nurses’ attention to and perceptions of pressure ulcer prevention in hospital settings. J Clin Nurs. 2012;21:1293-303.

[21] Buss IC, Halfens RJG, Abu-Saad HH, Kok G. Pressure ulcer prevention in nursing homes: views and beliefs of enrolled nurses and other health care workers. J Clin Nurs. 2004;13:668-76.

[22] Beeckman D, Defloor T, Schoonhoven L, Vanderwee K. Knowledge and Attitudes of Nurses on Pressure Ulcer Prevention: A Cross-Sectional Multicenter Study in Belgian Hospitals. Worldviews Evid-Based Nurs. 2011;8:166-76.

[23] Qaddumi J, Khawaldeh A. Pressure ulcer prevention knowledge among Jordanian nurses: a cross- sectional study. BMC Nursing. 2014;31:1-8.

[24] Gunningberg L, Mårtensson G, Mamhidir A-G, Florin J, Muntlin Athlin Å, Bååth C. Pressure ulcer knowledge of registered nurses, assistant nurses and student nurses: a descriptive, comparative multicentre study in Sweden. International Wound Journal. 2015;12:462-8.

[25] Gunningberg L, Mårtensson G, Mamhidir A-G, Florin J, Muntlin Athlin Å, Bååth C. Pressure ulcer knowledge of registered nurses, assistant nurses and student nurses: a descriptive, comparative multicentre study in Sweden. International Wound Journal. 2013:n/a-n/a.

[26] Demarré L, Vanderwee K, Defloor T, Verhaeghe S, Schoonhoven L, Beeckman D. Pressure ulcers: knowledge and attitude of nurses and nursing assistants in Belgian nursing homes. J Clin Nurs. 2012;21:1425-34.

[27] Macens K, Rose A, Mackenzie L. Pressure care practice and occupational therapy: Findings of an exploratory study. Australian Occupational Therapy Journal. 2011;58:346-54.

[28] Rose A, Mackenzie L. 'Beyond the cushion': a study of occupational therapists' perceptions of their role and clinical decisions in pressure care. Disability & Rehabilitation. 2010;32:1099-108.

[29] Black J, Cuddigan J, Walko M, Didier A, Lander M, Kelpe M. Medical device related pressure ulcers in hospitalised patients. International Wound Journal. 2010;7:358-65.

[30] Vanderwee K, Defloor T, Beeckman D, Demarré L, Verhaeghe S, Van Durme T, et al. Assessing the adequacy of pressure ulcer prevention in hospitals: a nationwide prevalence survey. BMJ Quality & Safety. 2011;20:260-7.

[31] Excellence NIfHaC. Safe staffing for nursing in adult inpatient wards in acute hospitals. NICE; 2014.

[32] Keogh B. Review into the quality of care and treatment provided by 14 hospital trusts in England: overview report. The National Health Service; 2013.

[33] Sprigle S, Sonenblum S. Assessing evidence supporting the redistribution of pressure for pressure ulcer prevention: a review. Journal of Rehabilitation Research and Development. 2011;48:201-14.

[34] Grol R, Wensing M. Principles of the Implementation of Change. In: Grol R, Wensing M, Eccles M, Davis D, editors. Improving Patient Care: The implementation of Change in Health Care. 2nd ed. Chichester: John Wiley & Sons; 2013.