

The Knowledge and Attitudes Regarding Pressure Ulcer Prevention among Healthcare Support Workers in the UK: A Cross-sectional Study

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Abstract

Background: Pressure ulcers cause significant, detrimental effects on personal wellbeing. They represent a serious health and social care burden. Nurses and those working in support roles are primarily accountable for preventing pressure ulcers. Healthcare support workers are an expanding group of key workers in the UK.

Objective: To examine healthcare support workers' knowledge and attitudes regarding pressure ulcer prevention.

Methods: A cross-sectional study was conducted from December 2020 to June 2021, using Knowledge and Attitudes toward Pressure Ulcer Prevention Assessment Tool.

Results: A total of 164 participants completed the questionnaire fully. A low mean knowledge score of 0.42 ± 0.14 , but a positive attitude score of 0.76 ± 0.10 per item were reported. The weakest areas of knowledge include aetiology, risk assessment and addressing pressure-reducing interventions for patients at risk. Higher mean scores per item in knowledge of pressure ulcer prevention were reported in participants working in acute hospital wards and nursing homes (0.468 ± 0.15 , 0.47 ± 0.08 respectively) than those in other settings ($p < 0.05$). Participants working in primary care scored lowest (0.33 ± 0.12). The scores of participants with more positive attitudes towards pressure ulcer prevention significantly correlated with higher score of knowledge ($p < 0.005$).

Conclusion:

While positive attitudes towards pressure ulcer prevention exist among healthcare support workers, this is overshadowed by significant knowledge deficits. Findings highlight the importance of continuing structured education for support workers across both acute and community settings. A future national survey and interventional study are needed to examine

support workers' pressure ulcer knowledge and to inform a national continuous education strategy.

Keywords: 'pressure ulcer prevention', 'knowledge', 'attitudes', 'healthcare support workers', 'cross-sectional design'

1. BACKGROUND

According to the National Pressure Ulcer Advisory Panel/European Pressure Ulcer Advisory Panel, a Pressure Ulcer (PrU) is described as an area of localized damage to the skin as a result of prolonged pressure alone or pressure in combination with shearing forces¹. A PrU is typically categorized into four key stages depending on ulcer depth and severity. PrUs are a preventable complication of acute and chronic illnesses, however international incidence of PrU is reported at 12% across diverse medical and surgical hospital settings². In the UK the occurrence in patients admitted to hospitals is estimated to be between 4% and 10%³.

PrUs are common among older people and patients who suffer from chronic illness including stroke, diabetes, dementia and spinal cord injury³⁻⁷. A prevalence of approximately 700,000 PrUs annually within the national healthcare service (NHS) England, extending hospital stays by 4–10 days^{3, 8, 9}. In intensive care units, developing PrU increases a two to four-fold risk of death in older people³. PrU has a significant psychological, economic and social impact on individuals and family¹⁰⁻¹³. In more severe cases, PrU results in prolonged hospitalisation, reduced quality of life, the need for surgical interventions and even fatal sepsis^{3, 6, 8, 14}. Apart from detrimental personal impact, the presence of PrUs also represents a significant cost burden for health and social care systems. According to the National Institute of Health and Care Excellence³, in addition to the costs of standard care, the daily costs of treating a PrU are estimated to range from £43 to £374 in the UK. Resources required for treating a PrU include nursing time, dressings, antibiotics, diagnostic tests, and high-specification pressure-redistributing devices³. The total cost of treating PrUs has been estimated to be between £1.4 billion and £2.1 billion per year (4% of total NHS expenditure) with the average cost to treat one Stage IV PrU estimated at £14,108 per episode in the general population^{3, 8, 15}.

The occurrence of PrU potentially attracts litigation threat and organisational and professional reputational damage, particularly for nursing professionals who represent the largest healthcare workforce traditionally enjoying the most sustained and closest contact to

patients. Nurses and healthcare workers in support roles are primarily accountable for preventing PrUs. In the UK, there are over 1.3 million frontline staff who are not registered nurses¹⁶. Healthcare support workers alone constitute approximately one-third of the caring workforce in hospitals¹⁶. Despite the recent introduction of Nursing Associate (NA) and Assistant Practitioner (AP) roles, whose skill level was intended to fill a ‘gap’ between that of the support workforce and registered nurses, research suggests that with the introduction of standard certificate of fundamental care, the ‘Care Certificate’, healthcare support workers now spend more time than registered nurses providing fundamental care, including skin care and undertake more complex tasks¹⁶. Previous research have shown inadequate knowledge of PrU prevention in registered nurses and recommended research into nurses’ attitudes to PrU prevention, prompting recommendations for tailored training in PrU prevention¹⁷⁻²². While healthcare support workers are an expanding group of key workers across diverse healthcare settings, their knowledge and attitudes towards PrU prevention is unknown. Indeed, the Department of Health (DOH) has urged that if the NHS seeks to improve patient care, it should view healthcare support workers as a critical, strategic resource²³. DOH highlighted the need to understand and improve healthcare support workers’ knowledge and practice²³. Therefore, this study aimed to explore the knowledge and attitudes of healthcare support workers to establish where resources can be focused to optimise their contributions to PrU prevention.

2. METHOD

A cross-sectional study using a validated questionnaire was conducted. Data were collected via an online Qualtrics platform in the period from December 2020 to June 2021.

2.1 Ethics approval

Ethical approval for conducting this study was obtained from the Health and Social care sub-committee, Middlesex University, London, United Kingdom. Information leaflets were provided. Participant consent was assumed by completion of the online questionnaires.

2.2 Participants

Participants in this study were members of the healthcare support workforce. In this study, healthcare support workers were defined as those holding the following titles: Assistant Practitioner (AP), Healthcare Assistant (HCA), Health Care Support Workers (HCSW),

Nursing Associate (NA) and Trainee Nursing Associate (TNA). For the recruitment of the participants, multiple strategies were adopted including advertisement of the study on social media via the Royal College of Nursing's Nursing Support Workers platform and Healthcare Assistants Facebook group. We also invited all 700 students enrolled on Nursing Associate and Pre-Registration Nursing programmes at a large London university who currently work in support roles.

2.3 Assessment Tools

There are various tools evaluating knowledge and Attitude on PrU prevention in the literature^{19,22,24-26}. Results cannot be generalized by using a tool without adequate validation. The PrU Knowledge Assessment Tool²⁵ and Attitudes toward PrU Prevention Tool²⁶ have been validated in different countries, including Australia, Mexico, China, Italy, Sweden, Ireland, and Belgium to assess nurses' knowledge on PrU prevention¹⁹. To test participants for the knowledge and attitude towards PrU we adapted the Knowledge and Attitudes toward PrU Prevention Assessment Tool^{25,26}.

We used Qualtrics software to distribute the questionnaire. The questionnaire comprised three parts, a) seven socio-demographic questions; b) 26 questions specific on the Knowledge PrU prevention; c) 13 questions specific to the attitude toward PrU prevention. For the 26-question knowledge instrument encompassing six categories: aetiology and development, classification and observation, risk assessment, nutrition, reduction in the amount of pressure/shear, and reduction in the duration of pressure/shear. Maximum total knowledge score for each participant is '26', with a maximum of '1' per item (100%). A mean total knowledge score equal or greater than 16 with item score of 60% (16 out of 26) was considered to be satisfactory²⁵. For the 13-question attitude tool, a 4-point Likert-type scale is used. Maximum total score for each participant is '52', with a maximum score of '1' per item (100%). A mean total attitude score equal or greater than 39 with item score of 75% (39 out of 52) was considered to be satisfactory²⁶.

To test readability and practicability, a pilot test was conducted among 20 trainees enrolled on a TNA programme at a large UK University. Following the pilot, no change to the original questionnaire was needed and data from the pilot study were included in final data analysis.

3. DATA ANALYSIS

The data were exported via online survey platform Qualtrics, and analysed using the Statistical Package for Social Sciences (version 25.0) (SPSS Inc., Armonk, NY). Data cleaning was carried out for consistency and accuracy. All data were examined for normality using a Kolmogorov-Smirnov test. The independent sample t test and ANOVA were used to compare the scores of independent groups for normally distributed data. The Mann-Whitney U and Kruskal-Wallis H tests were used to compare the scores of independent groups for non-normal distributed data. If the differences were significant between groups, a post-hoc test was performed to identify differences between any two groups. Pearson correlation (r) was used to evaluate the correlations between the attitude score towards PrU prevention and knowledge score in PrU prevention and each theme of Knowledge. Significance level was set at <0.05 .

4. RESULTS

4.1 Sociodemographic characteristics of participants.

A total of 277 individuals logged into the survey platform between December 2020 and June 2021. Of these, 226 completed the questionnaire partially (n=62) or fully (n=164). Nearly 40% participants were TNAs, over one-fourth participants were HCAs. The participants in the 'other' group comprised nursing students, hospital bank care assistant, dental nurse, receptionist, regional healthcare trainer, trainer assessor. Two-third of participants had received some training in nursing or healthcare-related professions, and attended some form of education on PrU that mainly are informal in-house training, webinars and lectures or working alongside Tissue Viability Nurses.

A number of participants worked in multiple healthcare settings. In order to examine individual settings, participants working in single settings were analysed for comparisons among different settings. Demographic data of all participants who completed questionnaires are shown in Table 1.

4.2 Knowledge of prevention of PrUs

One hundred and sixty-four participants completed the 26-question knowledge of PrU prevention tool with a mean score and standard deviation of 10.9 ± 3.57 . Mean score per item was 0.42 ± 0.14 (42% \pm 14%). Among the six categories, participants scored highest in nutrition category with a mean item score of 0.66 ± 0.47 (66% \pm 47%), lowest in aetiology with a score of 0.37 ± 0.22 (37% \pm 22%). (Table 2).

Table 1 The demographic data of all participants who responded to the survey

Variables	Numbers (percentage) of participants completed questionnaire fully or partially (N=226)	Numbers (percentage) of participants completed questionnaire fully (N=164)
Support workers role		
<i>Assistant Practitioner</i>	21 (9.3)	19 (11.6)
<i>Health Care Assistant</i>	60 (26.6)	43 (26.2)
<i>Health Care Support Worker</i>	25 (11.1)	18 (11.0)
<i>Nursing Associate</i>	13(5.8)	8 (4.9)
<i>Trainee Nursing Associate</i>	86 (38.1)	65 (39.6)
<i>Other</i>	21 (9.3)	11 (6.7)
Gender		
<i>Male</i>	62 (27.4)	53 (32.3)
<i>Female</i>	163 (72.1)	111(67.7)
<i>Prefer not to say</i>	1(0.4)	0 (0)
Age		
<i>18yr-34yr</i>	96 (42.5)	76 (46.2)
<i>35yr-44yr</i>	77 (34.1)	51 (31.1)
<i>45yr-54yr</i>	46 (20.4)	30 (18.3)
<i>55yr-65yr</i>	7 (3.1)	7 (4.2)
Clinical settings		
<i>Acute Hospital OPD</i>	*37 (15.0)	*32 (19.5)
<i>Acute Hospital Ward</i>	*94 (38.1)	*69 (42.1)
<i>Community</i>	*36 (14.6)	*28 (17.1)
<i>Nursing Home</i>	*20 (8.1)	*12 (7.3)
<i>Primary Care</i>	*29 (11.7)	*7 (4.3)
<i>Other</i>	31(12.6)	16 (9.8)
Nursing or healthcare related training		
<i>Yes</i>	152 (67.3)	108 (65.9)
<i>No</i>	74(32.7)	56 (34.1)
Pressure Ulcer training		
<i>Yes</i>	148 (65.5)	110 (67.1)
<i>No</i>	78 (34.5)	54 (32.9)

Value expressed as numbers of responders with value of percentages included in brackets.

** Numbers include multiple settings*

Table 2. Scores of Attitude and Knowledge alongside its six categories among participants who completed the PrU questions (N=164)

Category	Mean \pm SD	Mean per item \pm SD
Aetiology	2.24 \pm 1.34	0.37 \pm 0.22
Classification	2.18 \pm 1.22	0.44 \pm 0.24
Risk assessment	0.77 \pm 0.73	0.39 \pm 0.37
Nutrition	0.66 \pm 0.47	0.66 \pm 0.47
Preventive measures to reduce the amount of pressure/shear	2.8 \pm 1.23	0.40 \pm 0.18
Preventive measures to reduce the duration of pressure/shear	2.23 \pm 1.35	0.45 \pm 0.27
Total knowledge score	10.9 \pm 3.57	0.42 \pm 0.14
Total Attitude score	39.26 \pm 5.25	0.76 \pm 0.1

4.2.1 Knowledge scores among participants with different roles

When comparing knowledge across participants with different roles, the results showed that TNAs scored highest in total knowledge and all six categories comparing to any other groups (Figure 1). TNAs scored 12.85 \pm 3.0 in PrU prevention knowledge with a mean item score of 47% (0.47 \pm 0.13), APs scored lowest 8.95 \pm 3.3 with mean item score of 34% (0.34 \pm 0.12). The post-hoc test shows that the differences are significant between TNAs and HCAs ($p < 0.0001$), TNAs vs. APs ($p < 0.0001$), and TNA vs. healthcare support workers ($p = 0.002$).

4.2.2 Scores among different settings

Participants working in nursing homes and acute hospital wards scored highest in total knowledge (12.3 \pm 2.1 and 12.2 \pm 3.9 respectively), with mean item score of 0.47 \pm 0.08 (47.1% \pm 8%) and 0.468 \pm 0.15 (46.8% \pm 15%) respectively. (Figure 2). The post-hoc test shows that participants working in acute wards scored significantly higher than those working in hospital OPD ($p = 0.002$), and primary care ($p = 0.03$),

Figure 1 Total Knowledge scores of PrU prevention among 164 participants with different roles

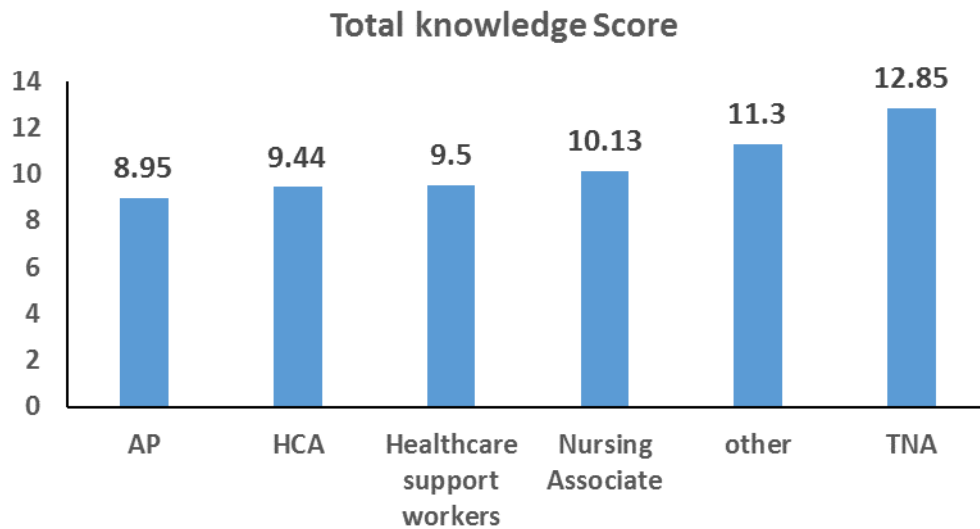
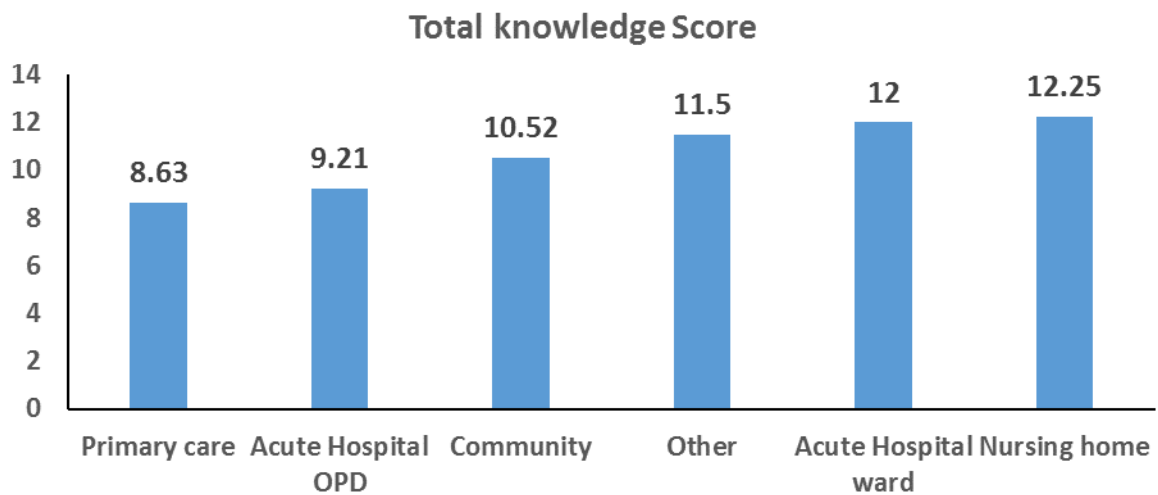


Figure 2 Total Knowledge scores of PrU prevention among 164 participants working in clinical different settings



4.2.3 Scores related to nursing or pressure ulcer management training

Participants who had undertaken nursing or healthcare professional training scored significantly higher compared to those without training in overall knowledge and its two sub-categories. These included a higher score in mean total knowledge ($p = 0.003$); risk assessment domain ($p = 0.02$) and preventive measures to reduce the duration of pressure or shear domain ($p < 0.0001$). However, there was no difference between participants who had any form of PrU training comparing to those participants who did not received training in total scores and scores in all six domains.

4.3 Attitude toward PrU prevention

Overall, the mean score regarding attitude towards PrU prevention was 39.2 ± 5.2 , with a mean score of 0.756 ± 0.10 ($75.6\% \pm 10\%$) per item among all 164 participants who completed PrU questionnaires.

4.3.1 Scores among different roles

TNAs scored highest with a mean score of 41.7 ± 4.2 , mean item score of 0.80 ± 0.08 ($80\% \pm 8\%$) in comparison to any other groups ($p < 0.05$). APs scored lowest 36.3 ± 5.6 , with a mean item score of 0.70 ± 0.11 ($70\% \pm 11\%$) (Figure 3). The post-hoc test shows that the differences in attitude scores are significant between TNAs and HCAs ($p < 0.0001$), TNAs vs. APs ($p = 0.001$), and TNA vs healthcare support workers ($p = 0.03$).

4.3.2 Scores among different settings

Participants working in nursing homes scored highest in attitude (41.14 ± 4.1), with a mean item score of 0.79 ± 0.08 ($79\% \pm 8\%$). Participants working in hospital OPD scored lowest 35.4 ± 4.2 , mean item score of 0.68 ± 0.08 ($68.0\% \pm 8\%$). (Figure 4).

The post-hoc test shows that participants working in hospital OPD scored significantly lower than those working in acute ward ($p < 0.0001$), and community ($p = 0.001$).

4.3.3 Attitude scores related to nursing or pressure ulcer management training

The attitude towards PrU prevention score was higher among those who have received nursing or healthcare related professional training ($p = 0.003$). There are no differences in

Figure 3 Attitude towards PrU prevention scores among 164 participants with different roles

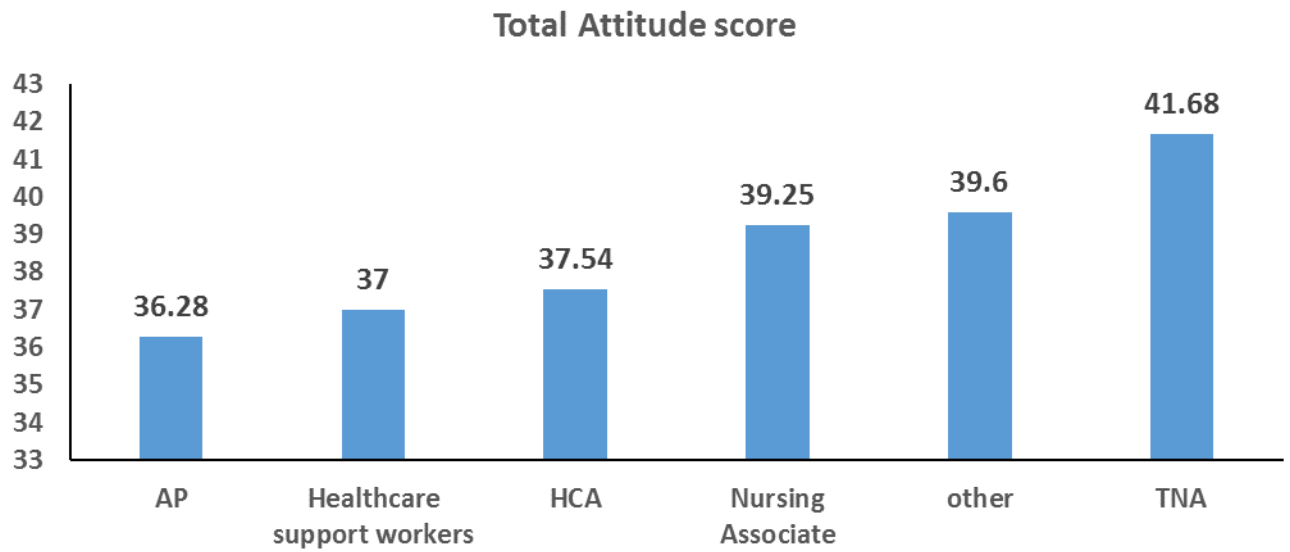
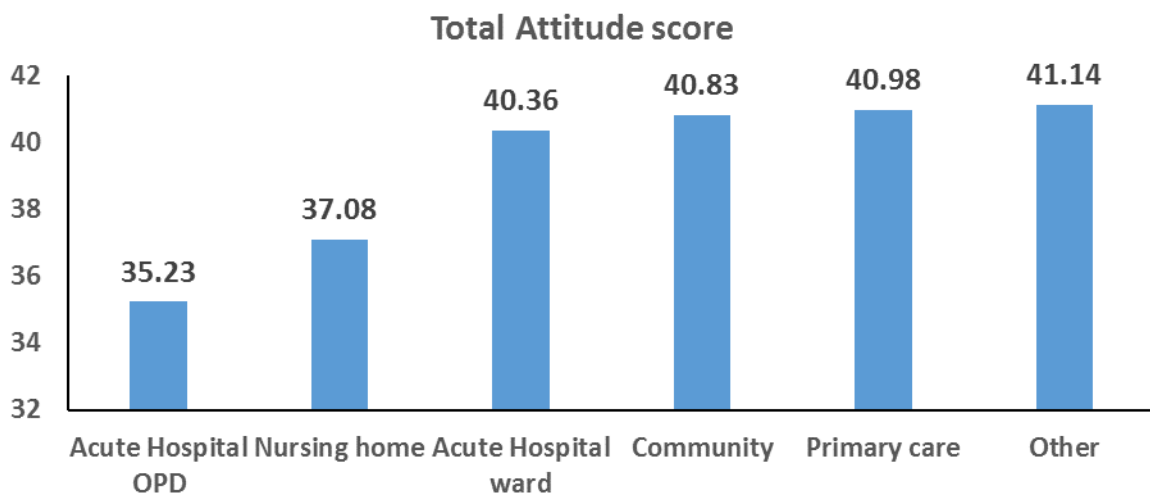


Figure 4 Attitude towards PrU prevention scores among 164 participants working in clinical different settings



attitude scores between participants who had any form of PrU training in comparison to those participants who did not have PrU training.

4.4 Correlation between Attitude and knowledge

As a whole, the higher attitude score significantly correlated to higher score of knowledge in PrU prevention ($P < 0.005$) and five sub-categories ($p < 0.005$). (Table 3)

Table 3 Correlations between Attitude and Knowledge alongside its six categories.

	Pearson	P value
Correlation to total score of Attitude	Correlation	
Total Knowledge	.534**	0.000
Aetiology	.223**	0.005
Classification	0.079	0.322
Risk assessment	.302**	0.000
Nutrition	.508**	0.000
Preventive measures to reduce the amount of pressure/shear	.280**	0.000
Preventive measures to reduce the duration of pressure/shear	.524**	0.000

** P value < 0.005 at level of significance

5. DISCUSSION

This is the first study to explore knowledge and attitudes regarding to preventing PrUs among healthcare support workforce in the UK. Our results indicated that there is lack of knowledge of PrU prevention among support workers across both acute and community settings in the UK. However, the participants in our study showed positive attitude (score of 75.6%), which reached that recommended by Beeckman of overall score of 75%. Some subgroup of participants i.e. TNAs scored higher (80%) than this recommended level.

Our study reported a lower mean knowledge score of 0.42 per item (42%) than the scores reported among allied healthcare professionals in two UK studies^{28,29}. Clarkson and colleagues used same questionnaire surveyed 119 healthcare professionals including nurses, physiotherapists, occupational therapists, podiatrists, healthcare and rehabilitation assistants. They reported a median score of 0.65 per item (65%) among all participants²⁸. Similarly, Worsley and colleagues reported a median score of 69% in five Physiotherapist and four occupational therapists²⁹. The scores of knowledge in our study are also lower than those studies reported from among assistant nurses in Sweden using the same instruments, and also lower than studies among registered nurses and nursing students from other European countries^{17,19,30-32}. For instance, Gunningberg and co-workers³⁰ reported a knowledge score of 0.55 (55.4%) for assistant nurses, 0.61(61.0%) for staff nurses, 0.59 (59.3%) for registered nurses in Sweden. Another study by Simonetti and colleagues³¹ who studied Italian nursing students reported knowledge scores 0.51 (51%) using the same cut-off point (60%) used by Beeckman²⁵. However, participants in our study showed a higher overall score in attitude (75.6%) than accepted as satisfactory (75%) by Beeckman. Our knowledge scores are similar to the findings in the literature among registered nurses or student nurses from other non-European countries^{20,33}. For instance, Tirgari and colleagues³³ conducted a study among 89 Iranian intensive critical care nurses and reported the mean score of PrU knowledge 0.44 using the same instrument. Similarly, Ebi and colleagues²⁰ carried out a cross sectional survey of 212 nurses (n=212) who had at least one year experience in direct patients care, and reported a mean of nurses' knowledge 0.43 per item (43%).

We found that participants who have taken nursing or healthcare professional training scored higher in Knowledge of PrU than those who have no training. Interestingly, there is no difference in the knowledge score among those participants who took any form of PrU training comparing to those without PrU training. This should be interpreted with caution. This is because the types of PrU training listed by participants in this study were ambiguous, most of them were informal or unstructured training, for example attending a webinar, working within the team, in-house induction, or work with a tissue viability Nurse. The findings highlight the importance of continuing structured PrU prevention education for nursing support workers across all clinical settings, particular primary care and acute hospital outpatients departments.

However, what has clearly emerged is that ad hoc and non-mandatory training of support workers in knowledge and skill acquisition does not appear to be effective in achieving this standard in communicating effectively within teams and to patients. It is evident that support workers such as TNAs students or nursing students who engage in formal university education demonstrate better knowledge in relation to PrU prevention. The weakest areas in knowledge are aetiology; risk assessment and pressure relieving interventions. Such knowledge cannot normally be gained from a short training course, but needs some more sustained teaching and learning. However, nursing support workers are generally not university educated.

Self-reported knowledge deficits in support workers are highlighted in this study. While prominent patient safety studies point to the association between degree prepared nurses and the prevention of patient harms³⁴, there was a sense that PrU prevention and associated negative outcomes would be further improved if regular and formal training and education was offered to support workers. At a minimum it would be helpful if PrU prevention training had a place amongst the repertoire of support worker mandatory skills training. Clarkson²⁸ suggest that while traditionally PrU prevention has been generally regarded as a nursing concern, they suggest that both HCAs and Occupational Therapist have more positive attitudes toward prevention strategies than nurses. A body of evidence indicated that healthcare outcomes improve when all staff feel valued as part of strong, self-reinforcing teams. There was a need for review of support worker's responsibility and autonomy regarding PrU prevention especially where support workers now take more challenging tasks and engage in complex activities to fill gaps, such as veno-puncture. There is a case perhaps for support workers with appropriate training, ideally interprofessional training, to have more authority to institute PrU interventions independently and in a timely fashion such as PrU assessment and dressing choice.

Strengths and Limitations

One of limitation of this study is that our data relies on self-reported knowledge and experience in a survey. The weakness inherent in this approach is that this type of data can be subject to bias in terms of social desirability. For example, participants in this instance unconsciously or consciously give responses relating to attitude which they think are likely to be viewed favourably by the researchers. Another limitation of this study is our sampling

technique for recruitment of participants. This study was funded by a charity with limited timeframe and it was carried out during the Covid-19 pandemic. Many of our potential participants were recalled to the frontline or cope increased pressures. We recruited the participants from multiple platforms to reach sufficient participants. Such approach makes us difficult to report the accurate response rate. Nevertheless, we used well established and validated questionnaire to collect the data from over 200 participants. We also conducted a pilot study to test the feasibility and practicability before full data collection. Our findings form the basis for a future nationwide survey and interventional study.

6. CONCLUSION

While our study has demonstrated knowledge deficits among support workers in the UK regarding PrU prevention, the study showed support workers had highly positive attitudes towards PrU prevention. The weakest areas of knowledge are identified as the aetiology of ulcers, risk assessment of PrU and addressing pressure-reducing interventions for patients at risk of developing PrU. Lack of formative training could contribute to this knowledge deficit. Our findings form the basis for a future larger sample national survey and interventional study to confirm the national level of knowledge in PrU prevention among this group. Future research is also necessary to understand whether this knowledge deficit is present in a broad range of other members of the interdisciplinary team.

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