

ORIGINAL ARTICLE

The impact of the Shanley Pressure Ulcer Prevention Programme on older persons' knowledge of, and attitudes and behaviours towards, pressure ulcer prevention

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Abstract

Pressure ulcers (PUs) have a profound impact on individuals, with studies demonstrating that compared with similarly aged persons, those living with a PU have a significantly lower quality of life. The aim of this study was to explore the impact of the Shanley Pressure Ulcer Prevention Programme (SPUPP) on older persons' knowledge of, and attitudes and behaviours towards, PU prevention. This was a multi-centre, open-label, randomised controlled trial. The population of interest was older persons living in the community who attended either a day care centre or a retirement group and were deemed to be at risk of PUs due to reduced mobility. Stratified random sampling was used to randomise based on days of attendance at day care centre/retirement group. Pretest and post-test were applied to the intervention and control groups. The SPUPP is a multimedia programme

The Shanley Pressure Ulcer Prevention Programme (SPUPP) impacted positively on knowledge scores of the participants and positively influenced attitudes and behaviours towards pressure ulcer prevention

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delivered using electronic media, hard copy materials, activities, and patient diaries and addresses the key tenets of PU prevention as described by the SKIN bundle. The programme contains five separate sessions delivered over 5 weeks. The impact of the SPUPP was assessed using the patient knowledge of and attitude and behaviour towards PU prevention instrument (KPUP). A total of 64 persons, 32 in each group, took part in the study. Of these, 75% ($n = 48$) were female, with a mean age of 81.9 years (SD: 5.56 years). Further, 68.8% ($n = 44$) were either overweight or obese and 40.6% ($n = 26$) were usually incontinent of urine. There were no differences between the intervention and control groups in mean scores during the pretest stage. However, at post-test, the mean scores for the intervention group were higher than the control group, 16.87 (SD: 1.88) versus 12.41 (SD: 3.21), respectively. For the post-test stage, mean differences between the two groups in favour of the intervention group ($\Delta = 4.46$) were statistically significant, as $t = 6.76$, $P = .0001$, and equal variances were not assumed. The SPUPP impacted positively on knowledge scores of the participants and positively influenced attitudes and behaviours towards PU prevention. Thus, this research provides information regarding the potential to enhance patient involvement in PU prevention.

KEYWORDS

health and well being, patient education, pressure ulcer, prevention

Key Messages

- a need for prevention of pressure ulceration among older at-risk adults and, as such, is in keeping with many health strategies and policies nationally and internationally
- the Shanley Pressure Ulcer Prevention Programme (SPUPP) impacted positively on knowledge scores of the participants and positively influenced attitudes and behaviours towards pressure ulcer prevention
- patient involvement in health care is fundamental in order to enhance outcomes in chronic disease prevention and management
- with the shift in health care delivery from the acute to primary care setting, a resource such as the SPUPP programme is valuable for assisting health care professionals in providing structured patient education

1 | BACKGROUND

Pressure ulcer (PU) prevention strategies are varied and include risk assessment and appropriate preventive care planning based on outcomes from this risk assessment.¹ With the shift in emphasis from acute services to community-based services, it is important that patients are educated in prevention strategies to enable them to continue to live independently in the community. As many older people have multiple comorbidities and therefore more complex health needs, this is a challenge for health professionals.² In Europe, the highest rate of growth in age groups is among older people. Given the relationship between ageing and reduced mobility, it is reasonable to assume that there is a potential for an

increase in the prevalence of PUs in this age group.³ Therefore, the prevention of PUs is a key issue for enhancing health in the older population. Education is a means to empower people to take an active role in health promotion.⁴ For supporting patients in their self-management for PU, development risk, education programmes need to enable patients to engage in self-management strategies aimed at optimal treatment management and encouraging adherence to prevention strategies.⁵

The European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel¹ international PU prevention and management guideline recommends structured education programmes for educating older adults to prevent PU. However, a recent Cochrane review

identified that to date there is no high certainty evidence that educational interventions make any difference to patient knowledge.⁵ Further, the authors stress that because of the low certainty of evidence additional research is required. Thus, this paper aims to bridge this theory–practice gap by evaluating a newly developed education package. The goal was to evaluate the Shanley Pressure Ulcer Prevention Programme (SPUPP), to determine its impact on older person's knowledge of and attitudes and behaviours towards PU prevention.

2 | METHOD

2.1 | Aim

The aim of this study was to explore the impact of the Shanley Pressure Ulcer Prevention Programme (SPUPP) on older persons' knowledge of, and attitudes and behaviours towards, PU prevention.

2.2 | Research design

This was a multi-centre, open-label, randomised controlled trial (RCT).

2.3 | Population

The population of interest was older persons living in the community who attended either a day care centre or a retirement group and were deemed to be at risk of PU, because of reduced mobility (due to any cause).

- Inclusion criteria were individuals
 - With reduced mobility (because of any cause) as described by the functional independence measure (FIM TM). The activity requires any one or more of the following: an assistive device, more than a reasonable time, or there are safety (risk) considerations.
 - Living independently in the community.
 - Aged 65 years or older.
 - Who provided written informed consent.
- Exclusion criteria were: individuals
 - Living in a long-term facility or a nursing home.
 - Who have cognitive impairment and/or were unable to understand the nature of the study, or provide written informed consent.
 - Who was already involved in another research project.
 - Who did not provide consent.

Stratified random sampling was used to randomise based on days of attendance at day care centre/retirement group. Stratification was by day of attendance at the centre rather than by different centres, as clients attended only on a set day during each week, therefore there was no crossover of clients. There were nine sites in total, with 8 days of attendance at day care centre and 1 day of attendance at a voluntary group. As the intervention was identifiable as being different from standard practice, it was not possible to blind either the staff or the participants in each group. Therefore, the study design was single blind, in that the outcome assessor was blind to the intervention group. Two researchers who were not involved in the study randomly stratified each centre to either the control or intervention group.

2.4 | Sample size

Based on a previous study evaluating the impact that a structured education programme had on patient's knowledge of leg ulcer prevention and healing behaviours, a mean baseline knowledge score of 11 and a standard deviation of 3 were assumed.⁶ To demonstrate a 30% relative increase in the mean score (equivalent to a mean score of 14.3), with 90% power and a statistical significance of 5% (two-sided), between the groups, with a maximum of eight patients per day of attendance and factoring in a loss to follow-up of 10% to 15%, a total of eight centres and 64 participants was required.

2.5 | Recruitment

Ethical approval for this study was sought and received from the Clinical Research Ethics Committee of the Local Teaching Hospital Committee and the Clinical Research Ethics Committee at the University (REC 1366). The first author approached the centre coordinators to act as a gatekeeper in each centre. Following randomisation, the gatekeeper issued individuals meeting the inclusion criteria the relevant information leaflet (depending on whether they were potentially control or experimental). Then, on their next visit to the day care centre, the first author approached the individuals to obtain consent. Data collection began immediately once consent had been given.

2.6 | Intervention

The Shanley Pressure Ulcer Prevention Programme (SPUPP) was developed to address the key tenets of PU

prevention as described by the SKIN bundle.⁷ The SPUPP is a multimedia programme delivered using electronic media, hard copy materials, activities, and patient diaries. The programme was developed in conjunction with a multi-disciplinary team within the author's work area to address the individual components of the programme. The team included tissue viability, physiotherapy, dietetics, researchers, and professional video photographers. The readability of the written materials was calculated using the Flesch–Kincaid grade level,⁸ which was built using Microsoft Word. The Flesch–Kincaid grade level was computed to be 6.3, which equates to a reading age of 11 to 12 years, while the Flesch–Kincaid reading ease is 73, which means it is assessed to be easy to read. The programme contains five separate sessions delivered over 5 weeks, as follows:

- Session 1:
 - This session provided an overview of the programme and explained the role of the skin and potential risks to skin integrity. It briefly described what a PU is and who is at risk of developing one.
- Session 2:
 - This session focused on skin care, particularly on how, where, and when to check the skin and what to check for. It provided some practical tips for keeping the skin in good condition. At the end of the session, participants were shown some examples of soap substitutes and moisturisers and given samples of each to try at home.
- Session 3:
 - This session focused on ways to prevent PU by “keeping moving.” It also explained ways of moving safely while sitting and discussed how to prevent pressure ulceration while lying in bed. The participant was also given an activity sheet to complete over the following week.
- Session 4:
 - This session focused on nutrition and discussed how the food that is eaten in addition to the fluids consumed affects general health. It briefly discussed the food pyramid and gave some examples of typical servings from each shelf of the food pyramid. The participant was also given a food diary to complete.
- Session 5:
 - This session focused on incontinence, its causes, and skin care advice for people who are living with incontinence. Samples of products that can be used for cleansing and protecting the skin from incontinence are also provided.

The education sessions were delivered on a one-to-one basis, although family members or carers were

welcome to attend if the participant wished. A session summary sheet was included to reinforce the main message in each presentation, and there were relevant activities associated with each session, such as nutrition diaries, activity sheets, and skin care samples such as moisturiser and soap substitutes for the participant to test, each of which was readily available to purchase over the counter. The use of written materials, namely, the booklet and summary sheets, were included to support the multimedia presentation.

2.7 | Data collection

First, demographic data were collected, namely age, gender, PU risk, including activity and mobility status, using the Braden Scale,⁹ BMI, and malnutrition risk using the MUST tool on day 0 before start of the programme. The impact of the SPUPP was then assessed using the patient knowledge of and attitude and behaviour towards the PU prevention instrument (KPUP).¹⁰ The tool consists of three sections, Section 1 addresses knowledge and contains 20 questions, Section 2 explores behaviours and contains 13 questions, and Section 3 addresses attitude and contains eight questions. Participant feedback was collected in an additional part of the questionnaire and involved answering seven questions pertaining to the participants' perceptions of the SPUPP on day 20 when the programme ended. The psychometric instrument validation of this instrument has been reported in a previous publication, and results show moderate internal consistency and general high test-retest stability.¹¹

2.8 | Data analysis

Complete data were stored, analysed, and presented using Predictive Analytics Software (PASW) Statistics for Macintosh Release 23.0.¹² The completed pre- and post-questionnaires were numerically recorded, tabulated, and entered into the SPSS programme. Data analysis was blinded. An alpha level of 0.05 was used to determine if the findings were statistically significant.

3 | RESULTS

Figure 1 outlines the flow of participants through the study. As can be seen, there were 32 participants in each group. One participant in the intervention group was admitted to the hospital following a fall at home and did not complete the programme.

3.1 | Demographics

Of the 64 participants, the majority (75%, $n = 48$) were female. Both groups had the same proportion of males (25%, $n = 8$). Five patients (7.8%) reported having a previous pressure ulcer. The age of participants varied from 70 to 96 years, with an average of 81.9 years (SD: ± 5.56 years). Both intervention and control groups had

similar mean ages ($M = 81.2$, min 70, max 94 intervention group, $M = 82.6$, min 74, max 96 control group).

Neither the intervention nor the control groups were found to violate assumptions of normal distribution, as assessed by the Kolmogorov-Smirnov and Shapiro-Wilk tests.^{13,14} Using an independent samples *t*-test, based on the assumption of the equality of variance, no statistically significant difference in age was detected between the

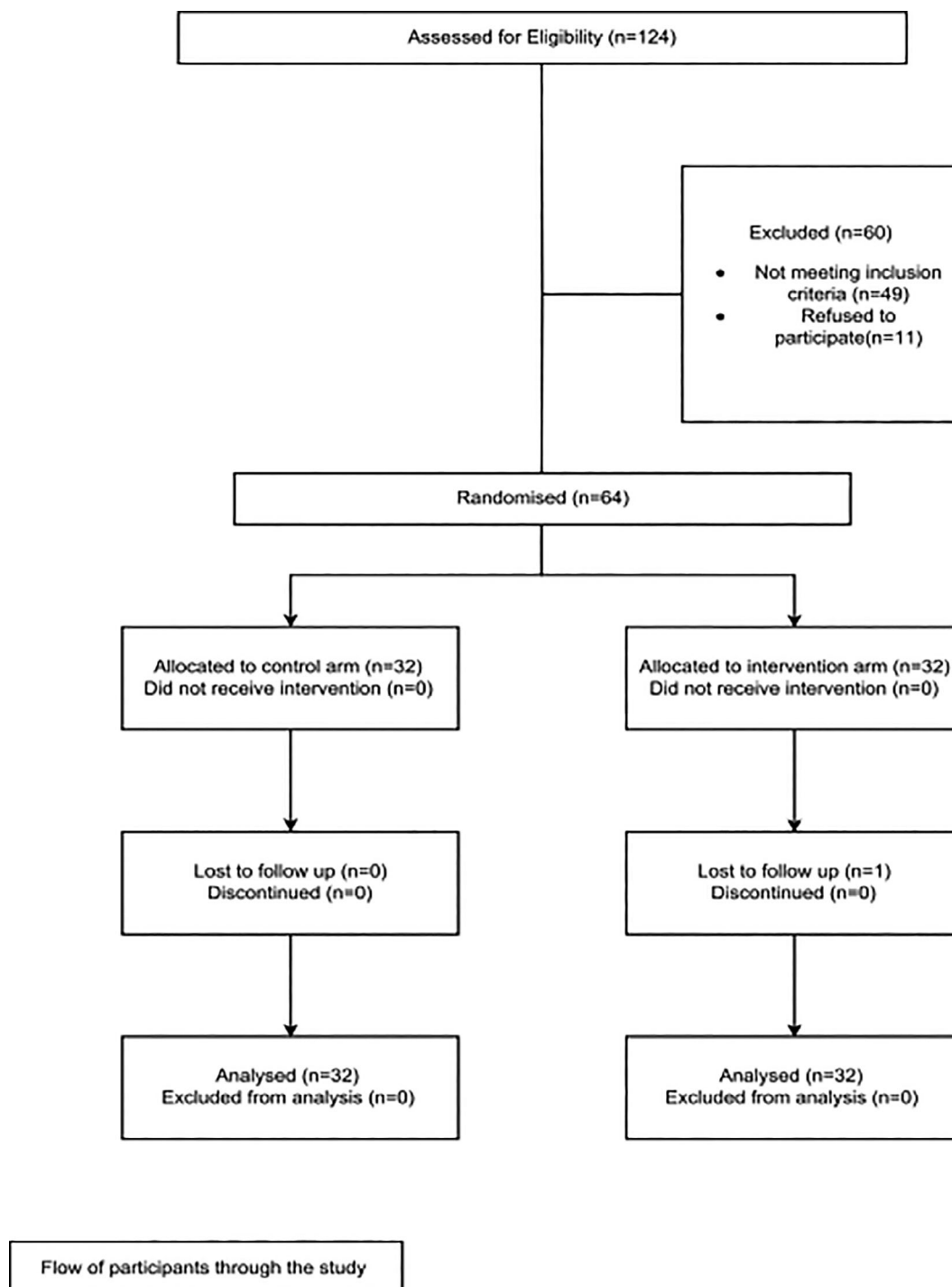


FIGURE 1 Flow of participants through the study

two groups ($t = 0.97$, $P = .34$). Although the difference between the male and female cohorts was slightly larger ($\Delta = 1.8$) than between the control and intervention groups ($\Delta = 1.3$), the difference between the two cohorts was not statistically significant ($t = 1.13$, $P = .26$).

3.2 | Braden score

The Braden score for risk of PU development was assessed on a total of 64 participants for days 1, 5, 10, and 63 participants for days 15 and 20. The findings are presented in Table 1, and as can be seen, overall most participants were at mild risk of pressure ulcer development (75%, $n = 48$), and there was little change in risk status over the duration of the study.

3.3 | Body mass index

Body mass index (BMI) was measured for 64 participants on days 1, 5, and 10, and for 63 participants on days 15 and 20. A total of 4.7% of participants ($n = 3$) had a BMI of less than 18.5, placing them in the underweight category. Furthermore, 26.6% of participants ($n = 17$) had a healthy BMI between 18.5 and 24.9. However, 37.5% of participants ($n = 24$) were in the overweight category, with BMI ranging from 25 to 29.9. Further, 31.3% of participants ($n = 20$) were obese with BMI higher than 30. Thus, 68.8% of the participants ($n = 44$) were either overweight or obese.

3.4 | MUST score

The Malnutrition Universal Screening Tool¹⁵ was used to measure the risk of malnutrition for all participants. One

participant reported unplanned weight loss of 5% to 10% over the previous 3 to 6 months. Of the 64 participants, 4.7% ($n = 3$) were deemed to be at high risk of malnutrition, 1.6% ($n = 1$) were at medium risk of malnutrition, and the remaining 93.7% ($n = 60$) were deemed to be at low risk of malnutrition.

3.5 | Incontinence

Continence status was assessed for all participants. Of the 64 participants, 53% ($n = 34$) were not incontinent, 41% ($n = 26$) were usually incontinent of urine, 3% ($n = 2$) were doubly incontinent, and 3% ($n = 2$) were occasionally incontinent of urine.

3.6 | Knowledge assessment results

For comparison of SPUPP knowledge assessment items between groups, pre/post individual item variables were recorded using SPSS as binary values, where correct answers were coded as 1, and incorrect or missing answers as 0. These scores were then summed to produce a total knowledge score for statistical exploration and analysis and had a maximum potential range of 20. Scores were computed for both pre- and post-test results and were then analysed by the control/intervention group. Individual question items, which were composed of multiple-choice questions designed to assess patient knowledge of best practice, were recoded to evaluate and compare the percentage of correct answers from the participant groups.

There were no differences between the intervention and control groups in mean scores during the pretest stage. However, at post-test, the mean scores for the intervention group were higher than the control group,

TABLE 1 Braden Score

Day	Count	Mild Risk	Moderate risk	High risk	No risk
1	64	48 (75%)	9 (14%)	1 (2%)	6 (9%)
5	64	48 (75%)	9 (14%)	1 (2%)	6 (9%)
10	64	47 (73%)	10 (15%)	1 (2%)	6 (9%)
15	63	46 (73%)	10 (15%)	1 (2%)	6 (9%)
20	63	46 (73%)	10 (15%)	1 (2%)	6 (9%)

TABLE 2 Comparison of participant knowledge scores

	Mean (SD)	Median	Min	Max	Skewness
Pre-intervention	11.69 (3.09)	11.5	6	17	-0.09
Pre-control	11.69 (3.60)	11.0	5	19	0.12
Post-intervention	16.87 (1.88)	17.0	12	20	-0.42
Post-control	12.41 (3.21)	11.5	7	19	0.47

16.87 (SD: 1.88) versus 12.41 (SD: 3.21) respectively (see Table 2; Figure 2). For the post-test stage, mean differences between the two groups in favour of the

intervention group ($\Delta = 4.46$) were statistically significant, as $t = 6.76, P = .0001$ and equal variances were not assumed.

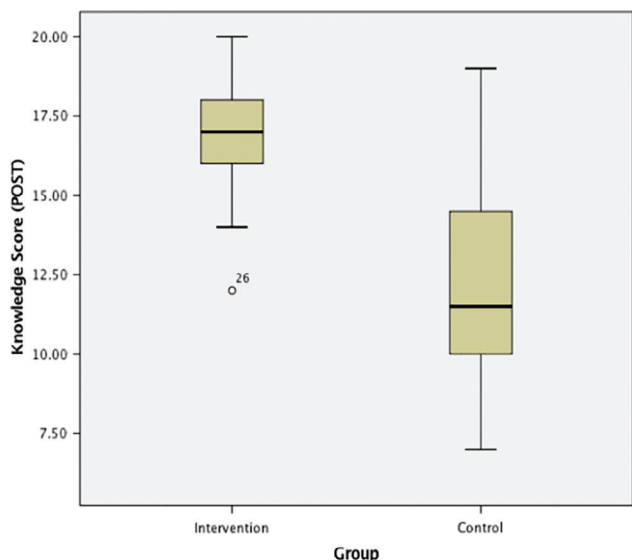


FIGURE 2 Knowledge score Intervention and Control group post-SPUPP

TABLE 3 Comparison of Activity levels

Group	Activity level	Pre-test %	Post-test %
Intervention	Bedfast	0.0	0.0
	Chair fast	3.1	6.5
	Walks occasionally	75.0	71.0
	Walks frequently	21.9	22.6
Control	Bedfast	0.0	0.0
	Chair fast	0.0	3.2
	Walks occasionally	84.4	64.5
	Walks frequently	15.6	32.3

3.7 | Health behaviours

Questions addressing lifestyle and measures to prevent PUs were asked before and after for both groups. It was notable that in the intervention group, the proportion of participants assessed as having “excellent” nutritional intake increased from 9.4% to 22.6%, while the control group remained unchanged at 15.6%. Comparison of reported fluid intake revealed a similar effect in the intervention group, while in the control group, fluid intake remained the same, or there was a reduction in reported fluid intake. The proportion reporting no fluid intake reduced after intervention from 21.9% to 3.2% in the intervention group, while the control group showed a moderate increase from 12.5% to 15.6%.

Questions about participant’s belief in suitable lifestyle measures showed little variation both between groups and over time. However, two changes were observed in the intervention group: a large increase in soap substitute being used (from 22% to 87%) and the use of a moisturiser (47%-90%). The use of these in the control group was stable over time. The degree of physical activity remained unchanged in the intervention group over time. However, a modest increase (15.6%-32.3%) in those reporting to walk frequently was observed in the control group (see Table 3).

3.7.1 | Attitudes towards pressure ulcer prevention

Section 3 of the questionnaire consists of eight questions designed to measure participant’s attitudes towards pressure ulcer prevention. The responses are measured on a

Q	Pre-test			Post-test		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree
34	50%	19%	31%	53%	6%	41%
35	56%	6%	38%	47%	6%	47%
36	25%	44%	31%	47%	28%	25%
37	68%	16%	16%	78%	13%	9%
38	56%	6%	38%	47%	0%	53%
39	3%	9%	88%	9%	3%	88%
40	34%	19%	47%	31%	16%	53%
41	56%	19%	25%	59%	13%	28%

TABLE 4 Comparison of pre- and post-attitudes control group (Q34-Q41)

TABLE 5 Comparison of pre- and post-attitudes Intervention group (Q34–Q41)

Q	Pre-test			Post-test		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree
34	53%	16%	31%	65%	0%	35%
35	34%	9%	56%	6%	0%	93%
36	38%	47%	16%	48%	19%	32%
37	56%	31%	31%	87%	3%	10%
38	41%	9%	50%	6%	0%	93%
39	3%	13%	85%	0%	3%	97%
40	16%	25%	59%	19%	6%	75%
41	59%	19%	22%	94%	3%	3%

Likert scale ranging from strongly agree to strongly disagree. The questions were as follows:

- Q34: “Everybody is at risk of developing pressure ulcers”
- Q35: “Pressure ulcer prevention is not necessary for me”
- Q36: “In my opinion, people tend not to get as many pressure ulcers nowadays”
- Q37: “Most pressure ulcers can be avoided”
- Q38: “I do not need to concern myself with pressure ulcer prevention”
- Q39: “A pressure ulcer almost never causes discomfort for a person”
- Q40: “Pressure ulcers are never preventable”
- Q41: “I feel confident in my ability to prevent myself from developing a pressure ulcer”

Attitudes did not change among the control group from pre-assessment to post-assessment (see Table 4). Attitudes changed in several areas in the intervention group. Participants generally were more confident and positive in terms of preventing or treating pressure ulcers (see Table 5).

4 | DISCUSSION

This study set out to explore the impact of the SPUPP on older person’s knowledge of and attitudes and behaviours towards PU prevention. This programme addresses a need for prevention of pressure ulceration among older at-risk adults and, as such, is in keeping with many health strategies and policies nationally and internationally. The results indicated that the participants in the intervention group displayed higher knowledge scores when the post-intervention scores were compared with

the pre-scores. Furthermore, knowledge scores in the intervention group improved significantly than those in the control group, and their skills increased and attitudes became more positive.

The participants’ demographic profile was similar to that of older persons in Ireland more generally and internationally. They were found to be overweight or obese, and this is similar to the general population in Ireland, mirroring the international trends.¹⁶ Positive ageing is a goal for all health care providers.¹⁷ Worryingly, it has been postulated that there is a potential for further increases in PU prevalence in the older age group.¹⁸ Therefore, it is vital that good preventive strategies are in place to reduce the burden of illness for this population. However, there is incongruence with the aspirations of health policy, as older persons are under-represented in research in general,¹⁷ and specifically in PU prevention education. In order to ensure that individuals are enabled to live active and healthy lives, they need to take more responsibility for their own health and the concept of empowerment really relates to the individual feeling that they have the knowledge skills and attitudes to participate in their own health care, their own health and maintenance of health.¹⁹

Result demonstrated that the SPUPP impacted positively on knowledge scores of the participants and also positively influenced attitudes and behaviours towards PU prevention. Their skills and attitudes increased or became more positive. However, there were some other areas worthy of exploration—for example, some practices that are maybe ritualistic such as rubbing of the skin, which is no longer recommended in the international guidelines. Interestingly, this finding is also reflected within the literature, suggesting that more emphasis needs to be placed on ensuring that education and training of all individuals, including the patient, can be focused on the most up to date and evidence-based

interventions.⁵ The findings are similar to Hartigan, Murphy²⁰ who showed that provision of a patient information leaflet led to improved knowledge scores for older adults in the community setting. Educational interventions for pressure ulcer prevention have also been shown to positively impact on knowledge scores among people with spinal cord injury.²¹⁻²⁶ The significance of the current study is that it is possible to impact an individual's knowledge and in doing so, providing the person with the ability to be able to participate in their own health promotion and health prevention. Patient involvement in health care and the rights of patients to have a central part to play in the health care process has long been seen as an important aspect of health care provision, and the benefits are believed to include enhanced motivation and knowledge about health and illness resulting in an increased ability to monitor and care for themselves.²⁷ This study contributes to the concept of active and healthy ageing, patient empowerment, and also of enhancing the capacity and capability of individuals living within the community care setting, all of which are in keeping with the Healthy Ireland Strategic Action Plan.²⁸

This study also challenges the myth pertaining to older persons and their supposed lack of willingness to access education, as the participants were really pleased with the programme and actively engaged with it. However, there were challenges posed in delivering the education and due consideration of the particular requirements of older adults must be given in planning future education programmes, for instance, visual and auditory challenges.²⁹ Simple elements such as ensuring the audio in programmes are clear and of sufficient volume and ensuring good lighting and that participants have their glasses, or hearing aids if they use them, is a simple but effective method of counteracting visual or audio challenges. Older adults' anxiety concerning formal education must also be addressed, and the provision of a comfortable and safe learning environment and ethos within the SPUPP was a valuable addition to the programme.³⁰ Indeed, the use of multimedia as a delivery method was also an effective way of dispelling the myth that older adults do not want to use the computer as a vehicle for learning, as almost 90% of the participants rated the computer as an excellent method of delivery.³¹

4.1 | Limitations of the study

The participants in the study highly rated the use of the computer to deliver the programme, indeed for some of the participants it was their first introduction to the computer as a means of education delivery. However, as

many community groups may not use or own computers for work, this form of delivery may not be feasible. The SPUPP, however, could be shown in DVD format in day care centres or community centres, or could be provided to patients to watch in their homes.

The timing of the data collection using the KPUP after intervention ensured that the information collected was current. However, because of the short study duration of 20 days, the potential is that this may have exaggerated the knowledge retained, but equally may not have been sufficient to measure behaviour changes. A longer follow-up period would assess if knowledge is retained and if behaviour changes are maintained. Further limitation was that the participants' quality of life scores were not measured before and after the intervention. Many of the participants live in isolated rural areas and alone. The data would have been valuable but unfortunately they were not captured. Within the KPUP study, recruitment was excellent with the author successfully reaching the target of 200 participants, but there was loss to follow-up of 15 participants, reducing the effective sample size to 185. However, the SPUPP also had excellent recruitment, with only one participant lost to follow-up due to hospitalisation for a fall. A gatekeeper was used to limit selection bias in this study; however, the principal investigator was known to some of the attendees of the day care centres, so they may have been more disposed to participate in the studies.

Despite the limitations discussed here, the study does provide insight into older adults who are living independently in the community and potentially not accessing public health services. The study provides guidance on how an education programme for this cohort of people may be delivered and evaluated and also identifies areas that need to be targeted in future research for this population.

5 | CONCLUSION

The SPUPP impacted positively on knowledge scores of the participants and positively influenced attitudes and behaviours towards PU prevention. Thus, this research provides information regarding the potential to enhance patient involvement in PU prevention. The significance of this is that it is possible to impact upon an individual's knowledge, and in doing so, provide the person with the ability to participate in their own health promotion and ill-health prevention. Patient involvement in health care is fundamental in order to enhance outcomes in chronic disease prevention and management. With the shift in health care delivery from the acute to the primary care setting, a resource such as the SPUPP programme is

valuable for assisting health care professionals in providing structured patient education. Furthermore, the programme may also be of value to health care workers and carers who manage at-risk patients in the community.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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