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Implementation of pressure ulcer prevention and management in elderly patients: a retrospective study in tertiary care hospital in Qatar

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ABSTRACT

Objective: Preventing pressure ulcers is an essential part of patient care and it is important to be aware of the best way to prevent it. Hence, the present study aims to look for the demographics, clinical characteristics, and risk factors in patients with and without pressure ulcer among elderly patients.

Methods: A retrospective longitudinal study was conducted in elderly (above 65 years) patients from a period of October 2014 to October 2015 in the medical ward under acute Geriatric care at Hamad General Hospital in Qatar.

Results: Overall, a total of 90 patients were included with an average age of $79 \pm SD 11.3$ years of which 45 patients developed pressure ulcer. There was male (64.4%) preponderance in the study population. Most common comorbidity was hypertension (77.8%). Anemia correction (91%), high protein diet supplementation (1.5 g/kg body wt.) (100%), and 2 h repositioning (100%) were implemented for majority of the pressure ulcer patients as preventive intervention.

Conclusions: From the study finding, it is observed that, anemia correction, high protein diet supplementation and 2 h repositioning are the best practices for the management of pressure ulcer. Hence, these best practices are recommended for the early prevention of pressure ulcer among elderly.

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Pressure ulcer; prevention intervention; elderly; comorbidities; Qatar

Introduction

Preventing pressure ulcers is an essential part of patient care and it is important to be aware of the best way to prevent it. According to international guidelines, pressure ulcer is defined as a “localized injury to the skin and/or underlying tissue usually over a bony prominence, resulting from sustained pressure (including pressure associated with shear)” [1]. Pressure ulcer causes pain, discomfort, prolonged hospital stay, prolonged illness, and heightened care costs. If in case the ulcer worsens then the treatment becomes more expensive and deteriorates the patient’s condition [2]. According to the severity, pressure ulcers can be classified into four groups. The classification has been revised by European Pressure Ulcer Prevention Advisory Panel (EPUAP) and National

Pressure Ulcer Prevention Advisory Panel (NPUAP), wherein pressure ulcers are divided into four categories, from stage 1 to stage 4. At stage 1, intact skin with non-blanchable redness, at stage 2 partial thickness loss of dermis, at stage 3 complete thickness tissue loss and at stage 4 loss of complete thickness tissue with exposed bone, tendon, or muscles [3].

Pressure ulcers are more prevalent in individuals having physical or mental health illness, which causes immobility. In particular, individuals who are wheelchair bound or bed ridden for prolonged time may develop impaired capillary perfusion and blood supply especially in type-2 diabetes, peripheral vascular disease, and frailty. Approximately, two-third of the pressure ulcers is reported in the elderly people between the age group of 60–80 years [4]. Various studies have

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reported the primary causes for developing pressure ulcer [4–7]. Hence, the present study aims to look for the demographics, clinical characteristics, and risk factors in patients with and without pressure ulcer among elderly patients.

Methodology

Study setting and design

A retrospective longitudinal study was conducted from a period of October 2014 to October 2015 in the medical ward under acute Geriatric care at Hamad General Hospital in Qatar.

Study population

The present study included elderly (above 65 years) patients with and without pressure ulcer development during the course of hospitalization in the medical ward under acute Geriatric Care at Hamad General Hospital. Patients less than 65 years of age were excluded from the analysis.

Sample size

For 95% confidence interval (CI) and significance level $\alpha = 5\%$, P1 (proportion of high protein diet supplementation in pressure ulcer patients)=90%, P2 (proportion of high protein diet supplementation in without pressure ulcer patients)=60% and required sample size was 32 in each group (total 64). The pilot study was done prior to the original study with 10 patients in the medical unit under acute Geriatric Care at Hamad General Hospital in Qatar. But the total sample size for this study was 90 patients, of which 45 patients developed pressure ulcer and 45 cases were without pressure ulcer.

Data included demographics (age, gender, marital status, nationality), clinical characteristics, CRP, procalcitonin, glucose, serum LDH, serum creatinine, TSH, alkaline phosphatase, HbA1c, ESR, RDW, vitamin D, albumin, Braden score, nutrition score (mini-nutritional score), lactate, blood urea nitrogen, hemoglobin, serum folate, aspiration pneumonia, urinary tract infection, CAD, dementia, social admission, diabetic mellitus, cerebrovascular accidents, hypertension, sepsis, anemia, other comorbidities, malignancy, chronic kidney disease, incontinence, infected wound, hypoalbuminemia, aspirin, prednisolone, statins, warfarin, iron, ACEI/ARB, clopidogrel, other medications, and stages of ulcer.

The Braden scale is made up of six subscales, scored from 1 to 4, or 1 to 3. The subscales are: sensory perception, moisture, activity, mobility, nutrition,

friction/shear, add the subscales together for a total score that ranges from 6 to 23. A lower score indicates higher levels of risk for pressure injury development. A score of 18 or less generally indicates at-risk status.

This study has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendment. This study obtained ethical approval from the Research Ethics Committee, at Medical Research Center, Hamad Medical Corporation (HMC), Doha, Qatar (IRB no.: 14192).

Statistical analysis

Data were presented as proportions, mean \pm standard deviation and 95% CI as appropriate. Variables were compared using the *t*-test for continuous variables and Pearson's chi-square test for categorical variables. Fisher's exact test was used, if the expected cell frequencies were below 5. Two tailed *p* values $< .05$ were considered to be significant. Binary logistic regression was used to quantify the relationship. Data analysis was carried out using the Statistical Package for Social Sciences version 18 (SPSS Inc., Chicago, IL).

Results

Overall, a total of 90 patients were included with an average age of 79 years (Table 1). There was male preponderance in the study population. Majority of the patients were Qatari National. Most common comorbidity was hypertension followed by diabetes mellitus and anemia. Hypoalbuminemia was present in 59.3%. Most commonly used medication was Statins followed by ACEI/ARB. Stage 2 ulcer was more common followed by stage 3 and stage 4.

Table 2 shows that the mean age of pressure ulcer patients was slightly higher compared to controls. Patients with pressure ulcer had significantly elevated BMI, CRP, procalcitonin, serum creatinine, TSH, alkaline phosphatase, ESR, albumin, lactate, BUN, high rate of Braden score (skin integrity risk) and nutrition score, as compared to those without pressure ulcer.

Table 3 shows that pressure ulcer was comparatively less in males and Qatari nationals than the odds ratios. However, the rate of aspiration pneumonia, chronic kidney disease, and malignancy were significantly higher in patients with pressure ulcer as compared to those without pressure ulcer. Anemia correction (91%), high protein diet supplementation-1.5 g/kg body wt. (100%) and 2 h repositioning (100%) were implemented for majority of the pressure ulcer patients as preventive intervention.

Table 1. Socio demographic and clinical characteristics of study participants.

| Variable | Mean \pm SD or n (%) | 95% confidence interval (CI) |
|------------------------------|------------------------|------------------------------|
| Age | 79.13 \pm 11.315 | (76.75–81.52) |
| Gender | | |
| Male | 58 (64.4) | (54.5–74.29) |
| Female | 32 (35.6) | (25.71–45.49) |
| BMI | 24.028 \pm 5.515 | (22.072–25.983) |
| Weight | 62.73 \pm 15.132 | (57.61–67.85) |
| Height | 160.48 \pm 10.411 | (156.79–164.18) |
| Unit | | |
| HGH | 71 (78.9) | (70.47–87.33) |
| RH | 19 (21.1) | (12.67–29.53) |
| Nationality | | |
| Qatari | 53 (58.9) | (48.74–69.06) |
| Arab Non Qatari | 32 (35.6) | (25.71–45.49) |
| Non-Arab | 4 (4.4) | (0.16–8.64) |
| Marital status | | |
| Married | 87 (96.7) | (93.01–100.39) |
| Single | 1 (1.1) | (0–3.25) |
| Widow | 2 (2.2) | (0–5.23) |
| Laboratory findings | | |
| CRP | 78.68 \pm 71.248 | (58.84–98.51) |
| Procalcitonin | 13.5367 \pm 54.53878 | (0–28.4229) |
| Glucose | 8.614 \pm 4.1005 | (7.735–9.493) |
| S.LDH | 17.37 \pm 52.537 | (0–36) |
| S.creatinine | 119.51 \pm 84.762 | (101.22–137.79) |
| TSH | 3.283 \pm 3.4316 | (2.287–4.280) |
| Alkphos | 124.07 \pm 108.302 | (98.44–149.71) |
| Hba1c | 6.907 \pm 1.3166 | (6.555–7.260) |
| ESR | 54.77 \pm 34.734 | (39.37–70.17) |
| RDW | 16.698 \pm 3.0489 | (16.040–17.355) |
| Vit. D | 27.43 \pm 11.712 | (23.87–30.99) |
| Albumin | 27.14 \pm 6.436 | (25.75–28.54) |
| Braden score ^a | 10.84 \pm 1.337 | (10.00–11.00) |
| Nutrition score ^b | 4.00 \pm 2.246 | (2.00–5.00) |
| HbA1c | 7.111 \pm 1.5191 | (6.700–7.522) |
| Lactate | 4.7598 \pm 13.81340 | (.7488–8.7708) |
| Bun | 10.87 \pm 6.404 | (7.86–14.05) |
| Hb | 10.507 \pm 2.3947 | (9.999–11.014) |
| S.folate | 26.040 \pm 13.1813 | (19.871–32.209) |
| Comorbidities | | |
| Aspiration pneumonia | | |
| No | 66 (73.3) | (64.16–82.44) |
| Yes | 24 (26.7) | (17.56–35.84) |
| Urinary tract infection | | |
| No | 73 (81.1) | (73.01–89.19) |
| Yes | 17 (18.9) | (10.81–26.99) |
| CAD | | |
| No | 72 (80) | (71.74–88.26) |
| Yes | 18 (20) | (11.74–28.26) |
| Dementia | | |
| No | 69 (76.7) | (67.97–85.43) |
| Yes | 21 (23.3) | (14.57–32.03) |
| Social admission | | |
| No | 89 (98.9) | (96.75–101.05) |
| Yes | 1 (1.1) | (0–3.25) |
| Diabetic mellitus | | |
| No | 30 (33.3) | (23.56–43.04) |
| Yes | 60 (66.7) | (56.96–76.44) |
| CVA | | |
| No | 49 (54.4) | (44.11–64.69) |
| Yes | 41 (45.6) | (35.31–55.89) |
| HTN | | |
| No | 20 (22.2) | (13.61–30.79) |
| Yes | 70 (77.8) | (69.21–86.39) |
| Sepsis | | |
| No | 43 (48.3) | (37.92–58.68) |
| Yes | 46 (51.7) | (41.32–62.08) |
| Anemia | | |
| No | 44 (50.6) | (40.09–61.11) |
| Yes | 43 (49.4) | (38.89–59.91) |

(continued)

Table 1. Continued.

| Variable | Mean \pm SD or n (%) | 95% confidence interval (CI) |
|-----------------|------------------------|------------------------------|
| Others | | |
| No | 40 (44.9) | (34.57–55.23) |
| Yes | 49 (55.1) | (44.77–65.43) |
| Malignancy | | |
| No | 64 (79) | (70.13–87.87) |
| Yes | 17 (20.9) | (12.1–29.75) |
| CKD | | |
| No | 75 (92.6) | (86.9–98.3) |
| Yes | 6 (7.4) | (1.7–13.1) |
| Incontinence | | |
| No | 46 (56.8) | (46.01–67.59) |
| Yes | 35 (43.2) | (32.41–53.99) |
| Infected wound | | |
| No | 78 (96.3) | (92.19–100.41) |
| Yes | 3 (3.7) | (0–7.81) |
| Hypoalbuminemia | | |
| No | 33 (40.7) | (30–51.4) |
| Yes | 48 (59.3) | (48.6–70) |
| Medication | | |
| Aspirin | | |
| No | 52 (65.8) | (55.34–76.26) |
| Yes | 27 (34.2) | (23.74–44.66) |
| Prednisolone | | |
| No | 64 (80) | (71.23–88.77) |
| Yes | 16 (20) | (11.23–28.77) |
| Statins | | |
| No | 52 (65) | (54.55–75.45) |
| Yes | 28 (35) | (24.55–45.45) |
| Warfarin | | |
| No | 72 (90) | (83.43–96.57) |
| Yes | 8 (10) | (3.43–16.57) |
| Iron | | |
| No | 72 (90) | (83.43–96.57) |
| Yes | 8 (10) | (3.43–16.57) |
| ACEI/ARB | | |
| No | 63 (78.8) | (69.84–87.76) |
| Yes | 17 (21.3) | (12.33–30.27) |
| Clopidogrel | | |
| No | 71 (88.8) | (81.89–95.71) |
| Yes | 9 (11.3) | (4.36–18.24) |
| Others | | |
| No | 34 (42.5) | (31.67–53.33) |
| Yes | 46 (57.5) | (46.67–68.33) |
| Stages of ulcer | | |
| Stage1 | 3 (10.3) | (0–21.36) |
| Stage2 | 11 (37.9) | (20.24–55.56) |
| Stage3 | 9 (31) | (14.17–47.83) |
| Stage4 | 6 (20.7) | (5.95–35.45) |

^aBraden Score 10-12 indicates high risk of developing a pressure ulcer.^bNutrition score 4 indicates medium risk for malnutrition and need for intervention.

Discussion

Globally, prevalence of pressure ulcer in geriatric patients varies widely from 9% to 32% [8–10]. This is a unique study from Qatar which shows the relationship between demographics, clinical characteristics, and risk factors overview in geriatric patients who developed pressure ulcer after hospitalization.

The current evidence shows that advanced age, ethnicity, BMI, physical impairments, cognitive impairment, and urinary or fecal incontinence are the most common risk factors of pressure ulcer [11]. The role of various comorbid conditions that affect soft tissue

Table 2. Comparison of pressure ulcer status and clinical characteristics.

| Variables | Without pressure ulcer | With pressure ulcer | p Value |
|--------------------|------------------------|---------------------|---------|
| Age | 81.5 ± 12.1 | 76.7 ± 10.1 | .044* |
| BMI | 12 ± 22.7 | 21 ± 24.8 | .377 |
| Weight | 56.8 ± 15.9 | 67 ± 13.3 | .052 |
| Height | 155.5 ± 11.4 | 163.3 ± 8.8 | .055 |
| CRP | 75.2 ± 63.1 | 81.5 ± 78.1 | .750 |
| Tissue debridement | 0.0 ± 0.0 | 0.2 ± 0.4 | .003* |
| Procalcitonin | 3.5 ± 8.1 | 23.5 ± 76.1 | .186 |
| Glucose | 9.3 ± 4.8 | 7.8 ± 3.1 | .087 |
| S.LDH | 73.9 ± 111.9 | 4.8 ± 9.4 | .191 |
| S.creatinine | 115.5 ± 82.4 | 123.8 ± 88.0 | .655 |
| TSH | 2.9 ± 1.6 | 3.6 ± 4.4 | .447 |
| Alkphos | 123.5 ± 108.3 | 124.6 ± 109.8 | .968 |
| HbA1c | 7.0 ± 1.2 | 6.8 ± 1.4 | .558 |
| ESR | 38.7 ± 28.0 | 70.8 ± 34.4 | .027* |
| RDW | 16.9 ± 3.2 | 16.4 ± 2.9 | .388 |
| BUN | – | 9.2 ± 8.2 | – |
| Hb | 10.7 ± 2.3 | 10.4 ± 1.4 | .601 |
| Vit D | 29.6 ± 12.8 | 24.6 ± 9.7 | .154 |
| Albumin | 26.2 ± 6.3 | 28.1 ± 6.5 | .174 |
| Braden score | 10.6 ± 0.5 | 11.2 ± 2.1 | .161 |
| Nutrition score | 3.8 ± 1.6 | 4.4 ± 3.0 | .304 |
| HbA1c | 7.2 ± 1.5 | 7.0 ± 1.6 | .712 |
| Lactate | 2.8 ± 2.2 | 6.4 ± 18.7 | .331 |
| BUN | 3.1 ± 0.0 | 11.3 ± 6.3 | .222 |
| Hb | 10.7 ± 2.3 | 10.3 ± 2.5 | .474 |
| S.folate | 26.3 ± 13.7 | 25.8 ± 13.4 | .945 |

*Statistically significant.

integrity and healing in the development of pressure ulcers in geriatric hospitals is rarely investigated. In our study, BMI, aspiration pneumonia, chronic kidney disease, and malignancy were more common in pressure ulcer patients compared to normal. Lenche et al. also reported that more than 90% of study participants suffered from at least one comorbid condition, with cardiovascular and neurological diseases being the most prevalent [12]. The authors also reported that increasing number of comorbid conditions was associated with pressure ulcer in hospitalized geriatric patients [7]. In contrary to other studies, we observed a higher frequency of diabetes mellitus in patient without pressure ulcer [13,14].

Donini et al. has conducted a study in nursing department comparing patients with pressure ulcer and without pressure ulcer, and they found a significant association between weight and BMI in the pressure ulcer patients [10]. Similar to our findings, a study compared 174 patients with and without pressure ulcer, suffering from multiple comorbidities, and hospitalized in the Skilled Nursing Department for three and half years. The authors found that anemia of chronic disease is significantly associated with pressure ulcer [15]. In another study of long-term care residents with PU, anemia was associated with non-healing over six months [11]. Blood transfusion might be an important tool in the treatment of pressure ulcer in patients

with low hemoglobin. Erythropoietin and intravenous iron supplementation (if there is concomitant iron deficiency) and other supplements (if there are concomitant vitamin B12 or folate deficiencies) are used in pressure ulcer patients with anemia of chronic disease [12–16].

It is important to understand the risk factors of pressure ulcer related to multiple chronic diseases, and complications. Understanding the pathway to immobility, tissue ischemia and undernutrition that develop pressure ulcer are crucial. The clinician should consider the whole clinical course of the patient, management of chronic diseases and their complications for prevention and treatment of avoidable or unavoidable pressure ulcers.

Appreciating pressure ulcer as a dreaded complication from advanced chronic comorbidities and associated health conditions can help guide treatment goals. Thus the patient, family, and health care team are empowered to improve prevention and optimize treatment of the wounds. Therefore, managing anemia, optimizing oxygen, and blood supply, maintaining mobility and muscle strength, minimizing bed-rest, stroke prevention, judicious use of antibiotics and careful attention to side-effects of medication as well as optimizing nutrition (and careful weight monitoring) is needed in patients with pressure ulcer. In addition, more traditional interventions such as pressure relief devices and repositioning serve as the optimal treatment for pressure ulcers. It also needed to change the treatment priorities to control the symptoms of pressure ulcer (unavoidable PU) and ultimately enhance the quality of life for the elderly patient.

Prevention of pressure ulcerations in geriatric patients is imperative to reduce patient morbidity, mortality, and overall healthcare costs. Prevention strategies for pressure ulcers begin with the identification of high-risk persons, appropriate allocation of resources, and adequate techniques of pressure relief [17].

Strengths and limitations

This is the first kind of study from Qatar which shows the relationship between demographics, clinical characteristics, and risk factors overview in geriatric patients who developed pressure ulcer after hospitalization.

This study highlighted the best care practice for pressure ulcer prevention at hospital settings by involvement of multidisciplinary team, which had not previously been tested in depth. Compliance with every 2-h repositioning standards significantly improved, especially during three shifts. Study findings

Table 3. Pressure ulcer status wise comparison of demographic characteristics, principal diagnosis, and comorbid condition.

| Variable | Control, n (%) | With pressure ulcer, n (%) | p Value | OR (CI) |
|--------------------------|----------------|----------------------------|---------|----------------------|
| Gender | | | | |
| Male | 30 (66.7) | 28 (62.2) | .660 | 1.21 (.512–1.88) |
| Female | 15 (33.3) | 17 (37.8) | | 1 |
| Unit | | | | |
| HGH | 43 (95.6) | 28 (62.2) | .00001* | 13.054 (2.797–60.92) |
| RH | 2 (4.4) | 17 (37.8) | | 1 |
| Nationality | | | | |
| Qatari | 30 (66.7) | 23 (52.3) | .361 | 1.906 (.783–4.644) |
| Arab non-Qatari | 13 (28.9) | 19 (43.2) | | 1.304 (.171–9.970) |
| Non-Arab | 2 (4.4) | 2 (4.5) | | 1 |
| Marital status | | | | |
| Married | 42 (93.3) | 45 (100) | .212 | – |
| Single | 1 (2.2) | 0 (0) | | – |
| Widow | 2 (4.4) | 0 (0) | | – |
| Comorbidities | | | | |
| Aspiration pneumonia | | | | |
| No | 35 (77.8) | 31 (68.9) | .340 | 1 |
| Yes | 10 (22.2) | 14 (31.1) | | 1.581 (.615–4.605) |
| Urinary tract infection | | | | |
| No | 33 (73.3) | 40 (88.9) | .059 | 1 |
| Yes | 12 (26.7) | 5 (11.1) | | .344 (.110–1.075) |
| Coronary artery disease | | | | |
| No | 36 (80) | 36 (80) | 1.000 | 1 |
| Yes | 9 (20) | 9 (20) | | 1 (.356–2.809) |
| Dementia | | | | |
| No | 39 (86.7) | 30 (66.7) | .025* | 1 |
| Yes | 6 (13.3) | 15 (33.3) | | 3.24 (1.126–9.345) |
| Social admission | | | | |
| No | 44 (97.8) | 45 (100) | .315 | – |
| Yes | 1 (2.2) | 0 (0) | | – |
| Diabetes mellitus | | | | |
| No | 13 (28.9) | 17 (37.8) | .371 | 1 |
| Yes | 32 (71.1) | 28 (62.2) | | 0.669 (1.62–0.277) |
| Cerebrovascular accident | | | | |
| No | 25 (55.6) | 24 (53.3) | .832 | 1 |
| Yes | 20 (44.4) | 21 (46.7) | | 1.094 (0.477–2.506) |
| Hypertension | | | | |
| No | 12 (26.7) | 8 (17.8) | .310 | 1 |
| Yes | 33 (73.3) | 37 (82.2) | | 1.68 (0.612–4.61) |
| Sepsis | | | | |
| No | 18 (40.9) | 25 (55.6) | .167 | 1 |
| Yes | 26 (59.1) | 20 (44.4) | | .554 (.239–1.284) |
| Anemia | | | | |
| No | 20 (45.5) | 24 (55.8) | .334 | 1 |
| Yes | 24 (54.5) | 19 (44.2) | | .660 (.283–1.536) |
| Others | | | | |
| No | 6 (13.6) | 34 (75.6) | .000* | 1 |
| Yes | 38 (86.4) | 11 (24.4) | | .051 (.017–.153) |
| Chronic kidney disease | | | | |
| No | 42 (93.3) | 33 (91.7) | .776 | 1 |
| Yes | 3 (6.7) | 3 (8.3) | | 1.273 (.241–6.720) |
| Malignancy | | | | |
| No | 42 (93.3) | 22 (61.1) | .000* | 1 |
| Yes | 3 (6.7) | 14 (38.9) | | 8.9 (2.3–34.3) |
| Incontinence | | | | |
| No | 19 (42.2) | 27 (75) | .003* | 1 |
| Yes | 26 (57.8) | 9 (25) | | 0.244 (0.093–0.635) |
| Infected wound | | | | |
| No | 45 (100) | 33 (91.7) | .048* | – |
| Yes | 0 (0) | 3 (8.3) | | – |
| Hypoalbuminemia | | | | |
| No | 6 (13.3) | 27 (75) | .0001* | 1 |
| Yes | 39 (86.7) | 9 (25) | | 0.051 (0.016–0.161) |
| 2nd hour turning | | | | |
| No | 17 (38.6) | 0 (0) | .0001* | – |
| Yes | 27 (61.4) | 45 (100) | | – |
| Anemia correction | | | | |
| No | 38 (86.4) | 4 (8.9) | .0001* | 1 |
| Yes | 6 (13.6) | 41 (91.1) | | 64.9 (16.9–247.9) |
| High protein diet | | | | |
| No | 18 (40.9) | 0 (0) | .0001* | – |
| Yes | 26 (59.1) | 45 (100) | | – |

(continued)

Table 3. Continued.

| Variable | Control, n (%) | With pressure ulcer, n (%) | p Value | OR (CI) |
|---------------|----------------|----------------------------|---------|---------|
| Osteomyelitis | | | | |
| No | 41 (95.3) | 7 (100) | 1.000 | – |
| Yes | 2 (4.7) | 0 (0) | | – |

*Statistically significant.

suggest that implementation of an interventional change in early pressure ulcer prevention, when informed by the Adaptive Leadership Framework, may be associated with positive changes in the older care. Finally, this study provided HGH staff an opportunity to approach elderly care in proactive way for skin care by implementation of innovative changes, as well as qualitative data on ways to develop a shared meaning for the intervention, as described in the guiding framework.

Limitations included the small sample size, random sampling, and single facility study setting. These limitations did not allow meaningful analyses of individualized risk profiles that varied by demographics, diagnoses, or other factors. However, the data collection, analysis, conclusions of study and acceptability took a longer time period for publication. This study could not estimate the period of pressure ulcer and its impact on length of hospital stay.

Conclusions

The prevention of pressure ulcers in the frail elderly population is a constant challenge in acute care settings. From the study finding, it is observed that early intervention with, anemia correction, high protein diet supplementation and 2 h repositioning is the best practice for the management of pressure ulcer. Hence, these best practices are recommended for the prevention of pressure ulcer among elderly. We believe that integrating all existing interventions to prevent occurrences for pressure ulcer is useful for geriatric patients. The utilization of existing of best practice guideline suggestions can control the occurrence of pressure ulcers which are preventable in most hospitalized patients. This study provides important insights into the knowledge translation of pressure ulcer prevention best practice recommendations at Qatar hospitals.

Disclosure statement

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