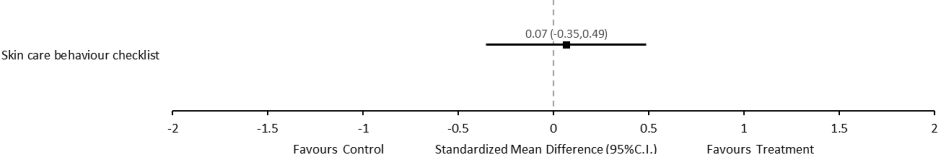


Author Year Country Research Design PEDro Score Sample Size	Methods	Outcome
Systematic Reviews		
<p>Baron et al. 2018 Canada Review of published articles from 1970-2016 AMSTAR=6 N=15</p>	<p>Method: Conduct a literature review on the content and effective of skin care self-management interventions for people with SCI Databases: MEDLINE, Embase. PsychINFO, CENTRAL, CINAHL, REHABDATA, CIRRIE, PeDro, ERIC and (World Health Organization International Clinical Trials Registry and Meta-Register of Controlled Trials. Level of evidence: 10 RCTs, 5 Non-RCTs. Questions/measures/hypothesis: Aim1: To better understand the content of interventions designed for skin care; Aim2: to focus on the effectiveness of RCTs aimed at skin care management.</p>	<ol style="list-style-type: none"> 1. 15 studies reviewed 17 different Behaviour Change Technique (BCT) interventions, with 5 general intervention types: Structured education programs (2 RCTs, 3 Non-RCTs); Telehealth (3 RCTs, 1 Non-RCT); Wheelchair skills training (3 RCTs); Risk assessment and feedback (1 RCT, 1 Non-RCT); Body positioning skills training (1 RCT). 2. Mediators of skin care measured included: Knowledge (2 studies used the Pressure injury Knowledge Test); Self efficacy (measured in 1 study using a validated scale adapted to PU); Skills relating to skin care (4 studies, three used Wheelchair Skills Training Questionnaire, 1 study measured body-positioning). 1. 7/10 RCTs measured skin status; only one interventions significantly improved skin status compared to controls (structured education versus standard education).
<p>Cogan et al. 2017 USA Review of published articles from 1999-2014 AMSTAR=5 N=5</p>	<p>Method: Conduct a systematic review of the efficacy of behavioural or educational interventions in preventing pressure injuries in community-dwelling adults with SCI. Databases: Cochrane, Clinical Trials, PubMed, Web of Science. Search combined related terms for <i>pressure injuries, SCI, and behavioural intervention</i>. Level of evidence: 3 RCTs, 2 quasi-experimental. Questions/measures/hypothesis: No specific hypotheses were tested by the authors.</p>	<ol style="list-style-type: none"> 1. 444 records were screened for inclusion, only 5 studies met inclusion criteria with a total of 513 participants. 2. One study used telephone sessions to deliver education, and another study used enhanced education methods. One study supported family members and caregivers. Two studies used relaxation, and stress/mood management for depression and wellness. <p>The results on pressure injury/skin breakdown outcomes were non-significant between groups in all 5 studies (p>0.05).</p>
<p>Gelis et al. 2012 France Review of published articles between 2000-2010 AMSTAR=4 N=6</p>	<p>Method: Systematic literature review of clinical trials written in English or French, with a human population. Article must pertain to pressure injuries. Databases: PASCAL, Biomed, PubMed, Cochrane Library. Level of evidence: level 2 evidence (4 RCTs), level 4 (2 pre-post). Questions/measures/hypothesis: 1. Determine the place of therapeutic patient education (TPE) in persons at risk of and/or those who have pressure injuries and make recommendations for clinical practice.</p>	<ol style="list-style-type: none"> 1. Four RCTS and two clinical trials. 2. No studies focused on specifically an elderly population. 3. TPE had a positive impact on the occurrence and severity of pressure injuries. 4. Two yr post-intervention showed to have an impact on recurrence rate compared to controls (33% vs. 90%, p=0.007). 3. The impact of TPE on depression and quality of life were conflicting.
Individual Studies		
<p>Kim & Cho (2017) South Korea RCT</p>	<p>Population: <i>Experimental Group (n=24):</i> Mean age=42yr; Gender: males=17, females=7; Level of Injury: Cervical=4, Thoracic=15, Lumbar=5; ASIA Classification:</p>	<ol style="list-style-type: none"> 1. There was no significant difference between the experimental and controls groups with regards to baseline demographics or clinical characteristics,

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PEDro=4 N _{Initial} =51 N _{Final} =47	<p>A=12, B=4, C=6, D=2; Mean time since injury=49.8 mo.</p> <p><i>Control Group (n=23):</i> Mean age=36.7yr; Gender: males=20, females=4; Level of Injury: Cervical=3, Thoracic=14, Lumbar=6; ASIA Classification: A=15, B=3, C=2, D=3; Mean time since injury=65.8 mo.</p> <p>Intervention: 6 hospitals were randomly allocated to the experimental group or the control group. The experimental group received an 8 wk self-efficacy enhancement program (small group education for 2.25 hrs in the 1st week for education and skill training, face-to-face counselling in the 5th week, telephone counselling for 10-15 mins in 3rd and 7th wks and computer based demonstrations at 3rd, 5th and 7th wks, and maintained a self-management journal). The control group was given a pressure injury prevention information booklet.</p> <p>Outcome Measures: Self-care knowledge tool, self-efficacy tool, self-care behaviors assessment tool, pressure injury incidence</p>	<p>except for the occupation after injury (P=0.036).</p> <ol style="list-style-type: none"> 2. Self-care knowledge, self-efficacy and self-care behaviours all improved in both groups but the experimental group showed significantly greater improvements after 8wks (p<0.001, respectively). 1. One participant in the control group developed a pressure injury during the 8wk test period, while none in the experimental group did. This difference was not statistically significant (p=0.49).
Guihan et al. 2014 United States PEDro=7 RCT N=143	<p>Population: Mean age=59.3 yr; Gender: males=139, females=4; Level of injury: cervical=60, thoracic=76, lumbar=7; ASIA classification: A=101, B=15, C=17, D=10; Mean time since injury=24.0 yr; Pressure injury stage: III or IV.</p> <p>Intervention: <i>Treatment group (n=71):</i> Self-management intervention, consisting of 7 group conference calls lasting 45-60 min and motivational interviewing intervention consisting of 8 one-on-one telephone counselling calls at pre-set times over 24 weeks..</p> <p><i>Control group (n=72):</i> Education intervention, equivalent to intervention group in terms of number and timing of sessions and who delivered it. Intervention emphasized teaching and advice giving while not including skills training and motivational interviewing.</p> <p>Outcomes: Skin Care Behavior Checklist; Skin status; Skin-related visits and admissions, Communication with Providers Scale, Self-Efficacy scale and descriptive measures (demographics, SCI factors and pressure injury characteristics); assessed at baseline, 3 & 6 months post discharge.</p> <p>Effect Sizes: Forest plot of standardized mean differences (SMD±95%C.I.) as calculated from pre- and post-intervention data.</p>	<ol style="list-style-type: none"> 2. No significant differences between the 2 groups in baseline demographics, medical, SCI or pressure injury characteristics; half had pressure injuries at discharge from hospital and had a high rate of comorbid conditions, (osteomyelitis 19.5%, diabetes 39.5% and depression 40.6%). 3. Study was designed with 80% power to detect a 30% difference between groups, but had only 143 participants so the study has less than 50% power. 4. At 3 mo and 6 mo, greater self-reported improvement in skin care behaviours in the intervention group at 3 and 6 months but it was not statistically significant (P=0.2; P=.04 respectively). 5. no significant differences were observed between groups in terms of Skin Care Behaviour Checklist, Skin status (skin worsening), skin-related visits, or skin-related admissions. 1. More than half of participants (combined groups) (n=75, 52.8%) experienced skin worsening, half of which were reported within the 3 months post discharge, usually in the first month

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	<p style="text-align: center;">Guihan et al. 2014; Self-management+motivational interviewing vs. education (control)</p> 	
<p>Rintala et al. 2008 USA RCT PEDro=6 N=41</p>	<p>Population: Mean age=29-78 yr; Gender: males; Injury etiology: SCI=39, multiple sclerosis=2; Level of injury: cervical=39%, thoracic=56%; Severity of injury: complete=68%.</p> <p>Intervention: SCI and multiple sclerosis patients receiving surgical repair of a stage III or IV pressure injury were randomized into 3 groups: <i>Group 1:</i> received an enhanced education and monthly structured follow-up intervention (via telephone) for 2 yr after discharge; <i>Group 2:</i> received monthly contacts (via mail) for up to 2 yr after discharge to assess skin status, but no education; <i>Group 3:</i> received minimal contact by mail every 3 mo for up to 2 yr after discharge to assess skin status but no education.</p> <p>Outcome Measures: Recurrence of pressure injuries or 2 yr after discharge.</p>	<ol style="list-style-type: none"> Group 1 had a significantly longer time before recurrence of pressure injuries than other groups, $p=0.002$; while no significant difference was seen between Group 2 and 3. Individuals were ulcer free longer if many yr had passed since their last surgery. Health status had no significant effect on staying ulcer free. For those with no previous ulcer surgery, persons in Group 1 were ulcer free longer than those in Group 2 or 3 (19.6 vs. 10.1 or 10.3 mo). <ol style="list-style-type: none"> Ulcer recurrence occurred in 1/3 of Group 1 (33.3%) compared to Group 2 (60%) and Group 3 (90%).
<p>Garber et al. 2002 USA RCT PEDro=5 N=41</p>	<p>Population: Mean age=53 yr; Gender: males=41; Injury etiology: SCI=39, multiple sclerosis (MS)=2; AIS: A=28, B=10, D=1. MS=2; Time since injury=17 yr.</p> <p>Intervention: <i>Intervention group</i> (n=20): four 1-hr enhanced education sessions dealing with management and prevention of pressure injuries and structured follow-up (monthly telephone contact regarding skin status and use of prevention behaviours). <i>Control group</i> (n=21): Standard educational information given with no structured follow-up (periodic telephone contact to address skin status only). All subjects followed for 2 yr after discharge or until recurrence of pelvic pressure injury.</p> <p>Outcome Measures: Demographic and health information questionnaire; Pressure injury knowledge test; Health beliefs questionnaire; Multidimensional health locus of control scale.</p>	<ol style="list-style-type: none"> At discharge, both groups had an improvement on the pressure injury knowledge test, but more pressure injury knowledge was acquired within the intervention group ($p<0.03$). At discharge, no notable differences were found on the health beliefs questionnaire and the multidimensional health locus of control scale. <ol style="list-style-type: none"> Even though both groups remembered pressure injury knowledge obtained 2 yr prior, the intervention group maintained a higher level of pressure injury knowledge (68%) than did the control group (60.8%) at 2 yr post-discharge.
<p>Schubart 2012 USA Pre-post N_{Initial}=15; N_{Final}=14</p>	<p>Population: Median age=37 yr; Gender: males=10, females=5; Level of injury: cervical=8, thoracic=5, lumbar=2.</p> <p>Intervention: Interactive e-learning program about pressure injury prevention and</p>	<ol style="list-style-type: none"> Program rated “mostly” or “very” easy to use, with the information being understandable and useful. The impact of increasing confidence in prevention/detection of pressure injuries

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	<p>management completed over a two wk timeframe. Follow-up questionnaire.</p> <p>Outcome Measures: (1) Internet evaluation and utility questionnaire; (2) Internet impact and effectiveness questionnaire; (3) Internet adherence questionnaire; (4) Knowledge acquisition using a questionnaire (based on the Needs Assessment Checklist) assessing skin and posture management, mobility and transfers, and wheelchair/equipment.</p>	<p>was rated “mostly” (n=4) and “very” (n=10).</p> <p>4. Adherence was rated as “slightly” (n=2), “somewhat” (n=10), and “very” (n=2), with the mean sitting lasting 45 minutes.</p> <p>1. Mean total knowledge scores increased from 92 to 106. Means by subsection: skin and posture, 39 to 49; mobility, 32 to 34; and equipment, 20 to 23. Greatest improvement was shown for skin checks and prevention of skin problems (p<0.005).</p>
<p>Thietje et al. 2011 Germany Pre-post N=214</p>	<p>Population: Level of injury: paraplegia=122, tetraplegia=92.</p> <p>Intervention: Neurological examinations of patients admitted between January 2005 and May 2008.</p> <p>Outcome Measures: (1) Performance of everyday tasks using the Spinal Cord Injury Measurement (SCIM) II; (2) Knowledge of pressure injuries and bladder management pre and post discharge using the Knowledge Boberg Score; (3) Patients asked source of knowledge. Measures were taken at admission, 1 and 3 mo post-admission, and 6, 18 and 30 mo post discharge.</p>	<p>2. Total SCIM II was higher at discharge compared to admission (p<0.001). Scores increased until 18 mo post-discharge.</p> <p>3. Mean knowledge scores increased from admission to discharge (5.4 to 11.2, p<0.001). At discharge knowledge was rated as poor, average or good for 22.4%, 30.4% and 47.2%, respectively. Poor knowledge was more common in older adults (65+, p<0.001).</p> <p>1. Clinical staff and special hospital courses were knowledge resources. Post-discharge, they were general practitioners and physiotherapists.</p>
<p>Brace & Schubart 2010 USA Pre-post N=20</p>	<p>Population: Mean age=47 yr; Gender: males=13, females=7; Level of Injury: cervical=7, thoracic=6, lumbar=6.</p> <p>Intervention: E-learning Program Learning section. Completion of the Living and Looking section was optional. The focus of the program was pressure injury knowledge.</p> <p>Outcome Measures: A newly developed 20 question test administered pre and post e-learning program.</p>	<p>1. Pressure injury knowledge improved in 16 of 18 individuals, 1 had a decrease in score and 1 had perfect scores at both time points. Median scores pre and post being 65 and 92.5 respectively.</p> <p>1. A lack of knowledge pertaining to pressure injury prevention was shown before the e-learning program.</p>
<p>May et al, 2006 Canada Pre-post N_{Initial}=27; N_{Final}=23</p>	<p>Population: Mean age=33.7 yr; Gender=18 male, 5 female; Level of injury: Cervical complete=4, Cervical incomplete=7, Thoracic complete=7, Thoracic or Lumbar incomplete=5; Average</p> <p>Intervention: Participants completed inpatient rehabilitation program which included an 8 wk lecture series two times per wk with content including pressure sore prevention techniques among others.</p> <p>Outcome Measures: 29-item Multiple Choice Questionnaire (MCQ), Life Situation Scenarios (LSS) (problem-solving ability), Perceived Importance</p>	<p>2. 18 of the 23 participants maintained or improved their knowledge from baseline (i.e., admission) with average scores at admission vs discharge vs follow-up of 22.26 vs 24.09 (p=0.041) vs 24.22 (p=0.023)</p> <p>3. Every participant demonstrated some improvement in problem-solving ability for some of the 12 topics; however individual scores remained unchanged or declined for some as well. For the content topic of skin care there was a trend toward improvement (admission to follow-up) (p=0.012; adjusted level of significance=0.004).</p> <p>1. Topics related to bladder care, bowel care, and skin cares were consistently rated as important at all 3 assessment times.</p>

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<p>Jones et al. 2003 USA Pre-post Study 1: N_{Initial}=8;N_{Final}=6 Study 2: N_{Initial}=4;N_{Final}=3</p>	<p>Population: Mean age=25-40 yr; Gender: males=6, females=2; Level of injury paraplegia; Time since injury=12-20 yr. Intervention: Study 1 - Behavioural Intervention: 3 primary components-health plan, clinic visits and financial rewards. Study 2 - Behavioural intervention: 2 treatments components were implemented (Health plan and visits) during the initial phase. Phase 2 - which began after the patient began to experience skin problems (Included visits plus payment). Outcome Measures: Severity of pressure sores were recorded at each level; Ulcer severity - classified using Average Pressure injury Scale for Healing (PUSH) tool.</p>	<p><i>Study 1:</i></p> <ol style="list-style-type: none"> 1. PUSH decreased from baseline by an average of 10.5 points per participant. 2. Six participants were hospitalized (not during the intervention) a total of 16 times during baseline for treatment of pressure injuries. 3. Fewer hospitalizations were also noted during the post-intervention phase compared to the baseline phase. Average monthly cost of care decreased from \$6262.00/participant to \$235.00 (US) <p><i>Study 2:</i></p> <ol style="list-style-type: none"> 2. Mean PUSH scores decreased from baseline by 8.3 points (visits only) and a further 3.1 points (visits & payment phase). 2. Total number of hospitalizations decreased from 1.67 (baseline) to 0.33 (intervention and post-intervention phase).
<p>Ghaisas et al. 2015 United States Case series N=25</p>	<p>Population: Mean age=45.5 yr; Gender: males=23, females=2; Level of injury: paraplegia=18, tetraplegia=6, undetermined=1; Severity of injury: complete=20, incomplete=5; Mean time since injury=20.5 yr. Intervention: Secondary analysis of a subset of participants from the intervention group of a randomized controlled trial (Lifestyle Redesign for Pressure injury Prevention in Spinal Cord Injury 2) were analyzed regarding the relationship between changes in lifestyle and changes in pressure injury status. . Data collected from 1,922 documented notes, an average of 40.9 notes per participant. Outcomes: Qualitative description of patterns behaviour or lifestyle changes relating to pressure injury development and lifestyle changes Behaviour change was conceptualized as eliminating discrete behaviours that increase pressure injury risk or adopting behaviours that reduce risk. Lifestyle change was the altering of one's daily life routines, adapting the physical and/or social environment, and developing a mindset that is cognizant of risk in everyday life situations.</p>	<ol style="list-style-type: none"> 2. Of the 47 cases reviewed, only 25 experienced pressure injuries and had clear patterns of lifestyle and behaviour changes. 3. Participants' characteristics in this secondary analysis closely mirrored the full study. 3. Four patterns of lifestyle changes as they relate to pressure injury development were identified: 1)Positive pressure injury changes accompanied by positive lifestyle/behaviour changes (n=19), 2) Negative or no pressure injury changes accompanied by positive lifestyle/behaviour changes (n=3), 3)Positive pressure injury changes accompanied by minor or no lifestyle/behaviour changes (n=1), 4)Negative or no pressure injury changes accompanied by minor or no lifestyle/behaviour changes (n=2).
<p>Cobb et al. 2014 Canada Case Series N=143</p>	<p>Population: <i>Pre-cohort</i> (n=70): Mean age=47.29 yr; Gender: males=61, females=9; Level of injury: C1-C4=23, C5-T1=27, T2-T10=8, T11-L2=11, L3-S3=1; ASIA classification: A=27, B=4, C=15, D=23, Missing=1. <i>Post-cohort</i> (n=73): Mean age=46.90 yr; Gender: males=58, females=15; Level of injury: C1-C4=18, C5-T1=22, T2-T10=12,</p>	<ol style="list-style-type: none"> 2. Baseline comparison between Cohort 1 & 2 found they were comparable for distribution of demographic and injury variables. 3. Screening for pressure injuries significantly increased from 31% to 60% (p<0.001) and the percentage of patients with a completed Braden assessments significantly increased from 13% to 55% (p<0.001).

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	<p>T11-L2=21, L3-S3=0; ASIA classification: A=26, B=9, C=13, D=25.</p> <p>Intervention: To evaluate the implementation of a Pressure injury Prevention Initiative (PUPI) with a goal of decreasing the incidence of PU's after admission and severity if they did occur, through a standardized and rigorous assessment and intervention process to ensure optimal care of patients. The protocol developed focused on 1) increased vigilance in skin monitoring by occupational therapist (OT), 2) OT use of a standardized assessment process, and 3) convenient access to necessary equipment. <i>Pre-intervention population (Pre-cohort)</i> (n=70) vs. <i>post-intervention population (post-cohort)</i> (n=73); all data were collected retrospectively.</p> <p>Outcomes: Screening for pressure injuries; Therapeutic Support Service (TSS) upgrade; Pressure injury incidence; Short-Form-36; Functional Independence Measure; Life Satisfaction Test-11.</p>	<ol style="list-style-type: none"> 4. No significant difference for number of patients receiving TSS upgrade between cohorts, but the percentage of patients receiving TSS upgrade from OT significantly increased from 31% to 70% (p=0.02). 5. No significant differences for number of patients with pressure injuries based on chart documentation, but the number of patients identified with pressure injuries according to OT skin care assessments significantly increased from 14% (cohort 1) to 33%(cohort 2) (p=0.002). 6. No significant differences for total number of pressure injuries and pressure injury recurrences were observed. 4. No significant differences observed in terms of Short-Form-36, Functional Independence Measure, or Life Satisfaction Test-11.