

Continuing Education Research Studies

The tables below describe research studies of continuing education linked to patient outcomes, changes in behavior or practice, and changes in knowledge. Outcome measures such as safety climate are included as potential precursors to changes in behavior or practice.

Note that for the purposes of this report, outcome summaries are given only for nurses from the studies that included CE participants from other disciplines unless the article did not report results separately for different types of CE participants.

1. Patient Outcomes

<i>Study –Patient Outcomes:</i>	<i>Continuing Education:</i>	<i>Outcome(s):</i>
Brown et al (1999) – >20 Nurse Practitioners in Kaiser Permanente HMO in Oregon (also 60+ MDs and other clinicians)	4-hour group workshops on skills: <ul style="list-style-type: none"> • building effective relationships with patients • successful negotiation 	no difference in patient ratings about clinicians’ communication skills
Stein et al. (2001) – 20 Tennessee nursing homes (10 intervention with 76 patients, 10 control, with 71 patients)	program on optimal treatment of musculoskeletal pain	improvements in <ul style="list-style-type: none"> • nonsteroidal anti-inflammatory drugs (NSAIDS) use (decreased) • acetaminophen use (increased) no difference in pain or function
Pridham et al (2006) – public health nurses: 11 experimental, 116 control; patients: 12 mothers of Very Low Birth Weight (VLBW) babies, 4 controls	28 classroom hours on supporting families to develop caregiving competencies through guided participation	no difference in mothers self-assessment of caregiving competency most experimental mothers rated selves as satisfied with guided participation
Gill & Ursic (1994) – hospital in Vancouver, BC; elderly hip fracture patients, 90 experimental, 63 control	experiential exercises and group discussions to develop care and management protocols (e.g., nutrition, voiding, confusion)	better rates of <ul style="list-style-type: none"> • time to first ambulation • length of stay on orthopedic unit
Monahan (1993) – 22 nurses & 45 dementia patients in special unit of nursing home	several 2-hour dementia-related sessions on, e.g., cultural and medical perspectives, interpersonal relations, Activities of Daily Living, adaptive activities	17 of 36 behavioral symptoms decreased post-test with the most dramatic reductions occurring in: <ul style="list-style-type: none"> • not following directions • poor personal hygiene • poor table manners • physically assaultive behavior • angry outburst • poor judgment

Study –Patient Outcomes:	Continuing Education:	Outcome(s):
Avorn et al (1992) – 12 nursing homes in Massachusetts matched in 6 experimental-control pairs in regard to ownership, size, level of drug use, etc.	geriatric pharmacology program to decrease use of psychoactive drugs	better scores in <ul style="list-style-type: none"> • psychoactive drug use; • discontinuation of anti-psychotic drugs; • deterioration of cognitive function; • anxiety reports
Muller-Staub et al. (2008) – nurses from 3 randomly drawn experimental and 3 control wards in a Switzerland hospital	monthly interactive guided clinical reasoning sessions over a period of 5 months (compared to classic case discussion methods)	intervention led to higher quality <ul style="list-style-type: none"> • nursing diagnosis documentation • aetiology-specific interventions enhanced nursing-sensitive patient outcomes

2. Changes in Behavior or Practice

Study –Behavior or Practice Change:	Continuing Education:	Outcome(s):
Price et al. (2005) – 33 Nurse Practitioners & Physician Assistants in Kaiser Permanente of Colorado system (also included 74 MDs); 2744 patients	breast mass education through 8- or 2-hour symposium of lectures, case discussion, demonstrations, and workshops plus 4-hour 1-on-1 mentorship with surgeon	more training and individual training was associated with <ul style="list-style-type: none"> • performing more breast mass aspirations • attempting more aspirations
Boutin et al. (2006) – 27 telephone triage nurses in Quebec, Canada	3-hour training in case studies & group discussion of e.g., computerized nursing protocol on asthma, including evaluation of severity	improvements in: <ul style="list-style-type: none"> • clinical evaluation of health problems • advice provided by nurses (including evaluation of caller's comprehension of information) <p>no difference in referral to Asthma Education Center</p>
Coleman et al. (2004) – 62 healthcare providers (MDs, RNs, Nursing Assistants) in 2 Army Reserve hospitals in Arkansas & Texas, 32 experimental, 30 control	use of standardized patients in clinical scenarios to assess performance on clinical breast examinations & breast screening	greater improvements in: <ul style="list-style-type: none"> • quality of clinical breast examinations • breast cancer screening
Mawn & Pakkala (2000) – 24 nurses at an immunization update conference in Massachusetts	half-day conference including <ul style="list-style-type: none"> • pediatric immunization update • discussions of cultural considerations 	no difference in behavior change reports 6 months later

Study –Behavior or Practice Change:	Continuing Education:	Outcome(s):
Czurylo et al. (1999) – 185 participants from 476-bed community medical center in suburb of major Midwestern city, posttest 50, followup 68	pain management lecture	98% of follow up reports indicated improved patient care from use improved posttest scores on use of information for care
Allison (1995) – 24 nurses from a variety of backgrounds at a large teaching hospital, retrospective 16	3-day wound management course	98% of retrospective reports indicated actively making changes in wound management practices in their wards
Parker et al. (1995) – RNs and LPNs in 3 North Carolina long-term care facilities, 35 treatment and 10 control	seven 20-minute sessions on diabetes control over 12 weeks	no difference in charted behaviors (e.g., giving insulin)
Harris et al. (1995) – 295 RNs, 114 LPNs in 24 Oklahoma hospitals (also included 45 physicians & 11 other health care providers); patients: 238 mother-infant pairs with sick or at risk neonates	completion of a self-paced (up to 4 months) perinatal continuing education program	greater rate of some health care practices at Time 2 (e.g., use of methods for gestational assessment)
Peden (1990) – 20 RNs and their supervisors	1-day seminar on patient education	RN and supervisor reports of increased patient education
Sundel et al. (1994) – 265-bed private nursing home in Dallas, Texas, 182 employees Time1, 209 employees Time2; 170 residents Time1, 70 residents Time2	90 minute training session on adverse effects and reform laws related to restraint use	Reduction in number of residents on restraints
Strumpf et al. (1992) – 38 staff (RN, LPN, nursing assistants) in one unit of 120-bed nursing home	restraint education program taught over a 4-month period	decline in restraint prevalence 3 months after the program
Middleton et al. (1999) – 83 people in long-term care settings, including RNs, LPNs	8-hour seminar on restraints	31% of participants reported their facility implemented changes, e.g., reviewing recreational programs
Harrington & Walker (2002_) – 91 staff (included RNs, LPNs) at life care community facility	computer-based and instructor-led modules on fire safety in nursing facilities	no significant differences in fire safety practices

Study –Behavior or Practice Change:	Continuing Education:	Outcome(s):
O'Connell et al. (1992) – 51 healthcare practitioners (RNs & LPNs) at 5 nursing homes	education program on correct metered-dose inhaler technique	improvement 2 months later in verbalization and demonstration of correct metered-dose inhaler technique
Meador et al. (1997) – 1311 elderly residents in 12 Tennessee nursing homes, 680 experiment, 631 control	program training to use structured guidelines rather than antipsychotic drugs for management of behavioral symptoms	<ul style="list-style-type: none"> • decreased use of antipsychotics • 33% of antipsychotic users withdrawn by month 6 with no increase in behavioral symptoms • 25% of those with continued use had a dose reduction of 50% or greater
Evans et al. (1997) – 3 Philadelphia-area nursing homes with 643 total residents & identical restraint use policies	comprehensive 6-month restraint education program taught by gerontologic nurse specialist	reduction in restraint prevalence for 3 measured time periods
Cronin-Stubbs et al. (1994) – 220 RNs, LPNs, and Certified Nurse Aides in 6 Illinois nursing homes and 4 home health agencies in a stratified random sample	one-day program on geriatric rehabilitation	increases in nurses' documented behaviors related to motivations, assessment, and independence of patients
Hagen & Sayres (1995) – 134 RNs and Nursing Assistants in a British Columbia 200-bed extended-care hospital	three 30-minute modules over 3 months on dementia with particular focus on aggression	large drop in reported incidents of physical aggression toward staff
Cohen-Mansfield et al. (1997) – 103 nursing staff recruited from 21 units in 4 Washington, DC-area nursing homes	40 minute program on dementia	<p>reports that residents were allowed to roam/wander to a greater extent at follow up compared to pretest</p> <p>improvements in nurse ratings of</p> <ul style="list-style-type: none"> • work difficulty • quality of care
Bradley et al. (1995) – 61 nursing home staff ("some RNs") in 4 Nova Scotia long term care facilities	10-part restraint education program	<p>restraint use declined in 3 of 4 facilities</p> <p>Increase in knowledge of elderly care in general</p>
Ray et al. (1993) – 4 rural Tennessee nursing	six 1-hr inservices to train staff to improve management of behavior problems &	<p>decreases in</p> <ul style="list-style-type: none"> • days of antipsychotic use

Study –Behavior or Practice Change:	Continuing Education:	Outcome(s):
homes; patients: 194 experimental, 184 control	minimize use of antipsychotic drugs	<ul style="list-style-type: none"> • days of physical restraint use
Campbell et al. (1991) – licensed and unlicensed nursing staff in 4 nursing homes, 96 experimental, 70 control; patients: 51 experimental, 37 control	4-hour program on urinary incontinence, including definition, prevalence, normal elimination, age-related changes, techniques for new protocol, etc.	experimental group did not fully implement the steps of the protocol
Santmyer et al. (1992) – RNs and LPNs on 3 units in a 233-bed LTC teaching facility; residents: 90 experimental, 69 control	2-week program on <ul style="list-style-type: none"> • psychiatric behavior problems and psychotropic medications • use of standardized nursing care plans & behavior observation flow sheets 	increases in quantity of nursing documentation in medical records
Timmel et al. (2010) – 28 staff of 18-bed surgical unit in Johns Hopkins	comprehensive unit-based program on safety	improvements in <ul style="list-style-type: none"> • teamwork climate • safety climate • perceptions of working conditions and management

3. Changes in Knowledge

Study – Knowledge Change:	Continuing Education:	Outcome(s):
Palmer et al. (2008) – 66 RNs & 39 LPNs at University of North Carolina Nursing School	1-day geriatric nursing workshop	better posttest scores on geriatric knowledge
Graham et al. (1997) – 52 experimental nurses & 15 control nurses, University Hospitals of Cleveland	6 class hours on chemical dependency	better scores on <ul style="list-style-type: none"> • substance abuse knowledge assessment • self-rated competency
Wolak et al. (2008) – 14 nurses at academic medical center	grand rounds presentation on a clinically unique pathology found in burn patients	86% met or exceeded the pre-established definition of knowledge acquisition
Bell et al. (2007) – 59 RNs with psychiatric patients near large midwestern academic medical center	1-day conference on genomics	improved posttest scores on genomic knowledge

Study – Knowledge Change:	Continuing Education:	Outcome(s):
Mawn & Pakkala (2000) – 24 nurses at an immunization update conference in Massachusetts	half-day conference including <ul style="list-style-type: none"> • pediatric immunization update • discussions of cultural considerations 	better 6-month followup posttest scores on a knowledge of current standards of practice in childhood immunizations
Parker et al. (1995) – RNs and LPNs in 3 North Carolina LTC facilities, 35 treatment and 10 control	seven 20-minute sessions on diabetes control over 12 weeks	better scores on 36-item knowledge test
Harris et al. (1995) – 295 RNs, 114 LPNs in Oklahoma 24 hospitals (also included 45 physicians & 11 other health care providers); patients: 238 mother-infant pairs with sick or at risk neonates	completion of a self-paced (up to 4 months) perinatal continuing education program	improved posttest scores on a 100-item knowledge test
Harrington & Walker (2002_) – 91 staff (included RNs, LPNs) at life care community facility	computer-based and instructor-led modules on fire safety in nursing facilities	better scores on fire safety knowledge
Bradley et al. (1995) – nursing home staff in 4 Nova Scotia long term care facilities, 61 staff ("some" RNs)	10-part restraint education program	increase in knowledge of elderly care in general
Campbell et al. (1991) – licensed and unlicensed nursing staff in 4 nursing homes, 96 experimental, 70 control; patients: 51 experimental, 37 control	4-hour program on urinary incontinence, including definition, prevalence, normal elimination, age-related changes, techniques for new protocol, etc.	increased knowledge scores
Santmyer et al. (1992) – RNs and LPNs on 3 units in a 233-bed LTC teaching facility; residents: 90 experimental, 69 control	2-week program on <ul style="list-style-type: none"> • psychiatric behavior problems and psychotropic medications • use of standardized nursing care plans & behavior observation flow sheets 	improved posttest scores on 14-item knowledge test
Markert et al. (2003) – 667 physicians, nurses, and other healthcare professionals participating in 8 programs, samples ranged from 39-179	9 continuing medical education programs (gastroenterology, trauma, perinatology, pain management, fertility care 1, fertility care 2, pediatrics, colorectal diseases, Alzheimer's disease)	significant gains in knowledge for 6 of the programs
Sharp & Lipsky (2002) – 315 physicans, physician assistants, nurses, and nurse	7-hour continuing medical education multicomponent program on type 2 diabetes	for allied professionals: more positive knowledge/attitude scores post program

Study – Knowledge Change:	Continuing Education:	Outcome(s):
practitioners from 8 states (California, Connecticut, Kentucky, Illinois, Michigan, New York, Oregon, Texas)		change did not persist at 3 months
Teri et al. (1991) – 487 Directors of Nursing, LPN, RN, and others, 143 experimental from 15 facilities and 344 control from 16 facilities not attending training	2-day training conference on specialized care for Alzheimer's patients	better scores on problem solving vignettes no difference on Alzheimer's information quiz
Smith et al. (1994) – 528 RNs and LPNs from 22 LTC facilities in 8 Iowa counties	2-day training program on geriatric mental health and illness for nursing personnel in rural settings	better posttest knowledge scores
Smith & Buckwalter (1998) – 193 RNs and nursing assistants from nursing homes in Charlottesville area	geriatric mental health training in two forms: direct train and train the trainers	better posttest scores on a 77-item knowledge test for participants in the direct train group no difference in posttest knowledge scores for train the trainer participants
Rosswurm et al. (2003) – 23 nurses and 44 nurse aides providing direct home care to functionally dependent elders in southern West Virginia	12-hour psychoeducational program on improving geriatric care	better Time 2 scores on: <ul style="list-style-type: none"> • competence • knowledge • resourcefulness (aides only) no difference in scores on resourcefulness for nurses
Neafsey (1997) – 27 RNs enrolled in a pharmacy course	home-study computer program on pharmacokinetics	better posttest scores on: <ul style="list-style-type: none"> • knowledge • self-efficacy
Neafsey (1998) – 18 advanced practice nurses in a primary care NP clinical seminar course	computer-assisted instruction program on the pharmacy of alcohol	better scores 5 months' post-program on: <ul style="list-style-type: none"> • knowledge • self-efficacy
Huber (1992) – RNs, LPNs, and nursing assistants from a 147-bed skilled nursing facility in Covington, Kentucky (also included administrative, support, and ancillary staff)	three 1-hour classes on the myths of aging and normal age-related changes	better posttest scores on knowledge for LPNs and nursing assistants no difference on posttest knowledge for RNS

Study – Knowledge Change:	Continuing Education:	Outcome(s):
Hagemaster et al. (1993) – 58 nurses in key clinical settings	2.5-day workshop on alcohol and drug abuse over 2 weeks	better posttest scores on substance abuse knowledge
Dancy et al. (2000) – 240 psychiatric and non-psychiatric nurses in Illinois	5-hour program on the fundamentals of mental health and HIV/AIDS	better posttest scores on a 20-item training knowledge questionnaire
Berarducci et al. (2002) – 63 RNs, women's health symposium in Florida	lecture and question-answer period based on National Osteoporosis Foundation guidelines	better posttest scores on osteoporosis-related knowledge
Verdu (2003) – Spain (hospital in Alicante) 32 experimental nurses 34 control nurses	use of decision tree	significantly more of experimental group selected appropriate dressing for ulcers no difference in grading of ulcers
Considine et al. (2006) – 20 emergency nurses, Australia	self-directed learning package on assessment of oxygenation and the use of supplemental oxygen	significant posttest improvements in hypothetical scenarios for <ul style="list-style-type: none"> • selection of masks • respiratory distress no difference in number or types of parameters used to assess oxygenation
Cruz et al. (2009) – 39 nurses at baccalaureate or higher level, Brazil	16-hour course over 4 days on critical thinking and clinical reasoning	significant posttest improvements in accuracy of diagnoses on two written case studies related to medical surgical nursing
Liaw (2003) – 13 experimental and 12 control NICU nurses, 2 large hospitals in Taipei, Taiwan	videotaped and personalized instruction for assessing preterm infant behaviors and offering developmentally supportive interventions	enhanced observational and cognitive abilities in experimental group for identifying behavioral cues and offering supportive interventions

References

- Allison J. The effect of continuing education on practical wound management. *J Wound Care*. 1995 Jan; 4(1): 29-31.
- Avorn J, Soumerai SB, Everitt DE, Ross-Degnan D, Beers MH, Sherman D, Salem-Schatz SR, Fields D. A randomized trial of a program to reduce the use of psychoactive drugs in nursing homes. *N Engl J Med*. 1992 Jul 16; 327(3): 168-73.

Bell DF, Pestka E, Forsyth D. Outcome evaluation: does continuing education make a difference? *J Contin Educ Nurs*. 2007 Jul-Aug; 38(4): 185-90.

Berarducci A, Lengacher CA, Keller R. The impact of osteoporosis continuing education on nurses' knowledge and attitudes. *J Contin Educ Nurs*. 2002 Sep/Oct; 33(5): 210-6.

Boutin H, Robichaud P, Valois P, Labrecque M. Impact of a continuing education activity on the quality of telephone interventions by nurses in an adult asthma client base. *J Nurs Care Qual*. 2006; 21(4): 335-43.

Bradley L, Siddique CM, Dufton B. Reducing the use of physical restraints in long-term care facilities. *J Gerontol Nurs*. 1995 Sep; 21(9): 21-34.

Brown JB, Boles M, Mullooly JP, Levinson W. Effect of clinician communication skills training on patient satisfaction. *Ann Intern Med*. 1999;131:822-9.

Campbell EB, Knight M, Benson M, Colling J. Effect of an incontinence training program on nursing home staff's knowledge, attitudes, and behavior. *Gerontologist*. 1991; 31(6): 788-94.

Cohen-Mansfield J, Werner P, Culpepper WJ 2nd, Barkley D. Evaluation of an inservice training program on dementia and wandering. *J Gerontol Nurs*. 1997 Oct; 23(10): 40-7.

Coleman EA, Stewart CB, Wilson S, Cantrell MJ, O'Sullivan P, Carthron DO, Wood LC. An evaluation of standardized patients in improving clinical breast examinations for military women. *Cancer Nurs*. 2004; 27(6): 474-82.

Considine J, Botti M, Thomas S. The effects of specific educational preparation on emergency nurses' clinical decisions regarding supplemental oxygen administration. *Nurs Health Sci*. 2006;8: 73-80.

Cronin-Stubbs D, Duchene P, LeSage J, Dean-Baar S, DiFilippo, JM, Kopanke D, Stehlin M, Swanson B. Evaluating a geriatric rehabilitation continuing education program for nursing home and home health agency nurses. *Appl Nurs Res*. 1994 May; 7(2): 91-6.

Cruz DM, Pimenta CM, Lunney M. Improving critical thinking and clinical reasoning with a continuing education course. *J Contin Educ Nrs*. 2009 Mar; 40 (3): 121-7.

Czurylo K, Gattuso M, Epsom R, Ryan C, Stark B. Continuing education outcomes related to pain management practice. *J Contin Educ Nurs*. 1999 Mar/Apr; 30(2): 84-7.

Dancy BL, Despotos J, Razzano L, Cook J. The impact of AIDS continuing education on psychiatric and non-psychiatric nurses' knowledge. *J Contin Educ Nurs*. 2000 Sep/Oct; 31(5): 204-8.

Evans LK, Strumpf NE, Allen-Taylor SL, Capezuti E, Maislin G, Jacobsen B. A clinical trial to reduce restraints in nursing homes. *J Am Geriatr Soc*. 1997 Jun; 45(6): 675-81.

Gill KP, & Usic P. The impact of continuing education on patient outcomes in the elderly hip fracture population. *J Contin Educ Nurs*. 1994 Jul/Aug; 25(4): 181-5.

Graham AV, Christy K, Emmitt-Myers S, Zyzanski S. Substance abuse education for clinical nurses: a controlled study. *J Contin Educ Nurs*. 1997 Sep-Oct; 28(5): 217-22.

Hagemaster J, Handley S, Plumlee A, Sullivan E, Stanley S. Developing educational programmes for nurses that meet today's addiction challenges. *Nurse Educ Today*. 1993 Jun; 13:421-5.

- Hagen BF, Sayers D. When caring leaves bruises: the effects of staff education on resident aggression. *J Gerontol Nurs.* 1995 Nov; 21(11): 7-16.
- Harrington SS, Walker BL. A comparison of computer-based and instructor-led training for long-term care staff. *J Contin Educ Nurs.* 2002 Jan/Feb; 33(1): 39-45.
- Harris JK, Yates B, Crosby WM. A perinatal continuing education program: its effects on the knowledge and practices of health professionals. *J Obstet Gynecol Neonatal Nurs.* 1995 Nov/Dec; 24(9): 835.
- Huber M, Reno B, McKenney J. Long-term care personnel assess their attitudes and knowledge of the older adult. *J Adv Nurs.* 1992; 17: 1114-21.
- Liaw J. Use of a training program to enhance NICU nurses' cognitive abilities for assessing preterm infant behaviors and offering supportive interventions. *J Nurs Res.* 2003; 11 (2): 82-91.
- Markert RJ, O'Neill SC, Bhatia SC. Using a quasi-experimental research design to assess knowledge in continuing medical education programs. *J Contin Educ Health Prof.* 2003 Summer; 23 (3): 157-61.
- Mawn B, Pakkala K. Immunization update: a community-based nursing education program. *J Contin Educ Nurs.* 2000 May/Jun; 31(3): 101-10.
- Meador KG, Taylor JA, Thapa PB, Fought RL, Ray WA. Predictors of antipsychotic withdrawal or dose reduction in a randomized controlled trial of provider education. *J Am Geriatr Soc.* 1997 Feb; 45(2): 207-10.
- Middleton H, Keene RG, Johnson C, Elkins, AD, Lee E. Physical and pharmacologic restraints in long-term care facilities. *J Contin Educ Nurs.* 1999 Jul; 25(7): 26-33.
- Monahan, DJ. Staff perceptions of behavioral problems in nursing home residents with dementia: the role of training. *Educational Gerontology.* 1993 Oct/Nov; 19(7): 683-94.
- Muller-Staub M, Needham I, Odenbreit M, Lavin MA, van Achterberg T. Implementing nursing diagnostics effectively: cluster randomized trial. *J Adv Nurs.* 2008; 63 (3): 291-301.
- Neafsey PJ. Immediate and enduring changes in knowledge and self-efficacy in APNs following computer-assisted home study of The Pharmacy of Alcohol. *J Contin Educ Nurs.* 1998 Jul/Aug; 29(4): 173-81.
- Neafsey PJ. Computer-assisted instruction for home study: a new venture for continuing education programs in nursing. *J Contin Educ Nurs.* 1997 Jul/Aug; 28(4):164-72.
- O'Connell MB, Hewitt JM, Lackner TE, Pastor JD III, Wong MT, Bishop AL. Short- and long-term retention of a nursing home education program on metered-dose inhaler technique. *Ann Pharmacother.* 1992 Jul/Aug; 26 (7-8): 980-4.
- Palmer MH, Kowlowitz V, Campbell J, Carr C, Dillon R, Durham CF, Gainer LA, Jenkins J, Page JB, Rasin J. Using clinical simulations in geriatric nursing continuing education. *Nurs Outlook.* 2008; 56: 159-66.
- Parker MT, Leggett-Frazier N, Vincent PA, Swanson MS. The impact of an educational program on improving diabetes knowledge and changing behaviors of nurses in long-term care facilities. *Diabetes Educ.* 1995 Nov/Dec; 21(6): 541-5.
- Peden AR, Rose H, Smith M. Transfer of continuing education to practice: testing an evaluation model. *J Contin Educ Nurs.* 1990 Mar-Apr; 21(2): 68-72.

Price DW, Xu S, McClure D. Effect of CME on primary care and OB/GYN treatment of breast masses. *J Contin Educ Health Prof.* 2005 Fall; 25(4):240-7.

Pridham K, Limbo R, Schroeder M, Krolkowski M, Henriques J. A continuing education program for hospital and public health nurses to guide families of very low birth-weight infants in caregiving. *J Contin Educ Nurs.* 2006 Mar Apr; 37(2): 74-85.

Ray WA, Taylor JA, Meador KG, Lichtenstein MJ, Griffin MR, Fought R, Adams ML, Blazer DG. Reducing antipsychotic drug use in nursing homes. *Arch Intern Med.* 1993 Mar 22; 133: 713-21.

Rosswurm MA, Larrabee JH, Nunley BL. Improving geriatric care, knowledge, competency, and resourcefulness of home care nurses and aides. *Home Healthc Nurse.* 2003 May; 21(5): 300-6.

Santmyer K, Serafini G, Larson E. Improving management of psychiatric and behavior problems in long-term care. *J Nurs Care Qual.* 1992 Apr; 6(3): 44-56.

Smith M, Buckwalter KC. From the rural Midwest to the rural southeast: evaluation of the generalizability of a successful geriatric mental health training program. *J Ment Health Aging.* 1998 Spring; 4(1): 125-38.

Smith M, Buckwalter KC, Garand L, Mitchell S, Albanese M, Kreiter C. Evaluation of a geriatric mental health training program for nursing personnel in rural long-term care facilities. *Issues Ment Health Nurs.* 1994 Mar-Apr; 15(2): 149-68.

Stein CM, Griffin MR, Taylor JA, Pichert JW, Brandt KD, Ray WA. Educational program for nursing home physicians and staff to reduce use of non-steroidal anti-inflammatory drugs among nursing home residents: a randomized controlled trial. *Med Care.* 2001 Dec; 39(5): 436-45.

Sharp LK, Lipsky MS. Continuing medical education and attitudes of health care providers toward treating diabetes. *J Contin Educ Health Prof.* 2002 Spring; 22(2):103-12.

Strumpf NE, Evans LK, Wagner J, Patterson J. Reducing physical restraints: developing an educational program. *J Gerontol Nurs.* 1992 Nov; 18(11): 21-7.

Sundel M, Garrett RM, Horn RD. Restraint reduction in a nursing home and its impact on employee attitudes. *J Am Geriatr Soc.* 1994 Apr; 42(4): 381-7.

Teri L, Baer LC, Orr NK, Reifler BV. Training nursing home staff to work with Alzheimer's disease patients. *Gerontol Geriatr Educ.* 1991; 11(3): 77-83.

Timmel J, Kent PS, Holzmueller CG, Paine L, Schulick RD, Pronovost PJ. Impact of the Comprehensive Unit-Based Safety Program (CUSP) on safety culture in a surgical inpatient unit. *Joint Commission Journal on Quality and Patient Safety.* 2010 Jun; 36 (6): 252-60.

Verdu J. Can a decision tree help nurses to grade and treat pressure ulcers? *J Wound Care.* 2003 Feb; 12 (2): 45-50.

Wolak, ES, Cairns B, Smith E. Nursing grand rounds as a medium for the continuing education of nurses. *J Contin Educ Nurs.* 2008 Apr; 39(4): 173-8.