Overview and characteristics of included studies (n=16)

Author, Year (Country)	Study aims	b. c. d.	Study design Study sample Subgroups Care setting Nursing discipline	Assessment instrument for estimating nursing competence Scale-specific competence dimensions [n _i]	Influence factors on nursing competence a. Experience b. Qualification c. Professional working context d. Knowledge and skills (non-formal)
1. Allvin et al., 2020 (Sweden)	Influence of overall professional work experience on nursing competence	a. b. c. d.	Cross-sectional n=266 RNs Work experience (in years/y): 3 clusters: <0.5y, >0.5-5y, >6y; Acute inpatient care Internal medicine,	PROFFNurseSAS Direct clinical practice [1] Professional development [2] Ethical decision-making [3] Clinical leadership [4] Cooperation and consultation [5] Critical thinking [6]	e. Values, norms and rules a. Overall professional work experience The higher the overall professional work experience, the higher the extent of nursin competence across all scale dimensions
2. Blomberg et al., 2019 (Sweden)	Influence of overall professional work experience and basic nursing qualification on nursing competence	b. с. d.	surgery Cross-sectional n=303 RNs Work experience (in years/y): 3 clusters: <10y, >10-20y, >20y; Qualification: 2 clusters: vocational vs. academical basic nursing education; Acute inpatient care Surgery (operating theater)	PROFFNurseSAS Direct clinical practice [1] Professional development [2] Ethical decision-making [3] Clinical leadership [4] Cooperation and consultation [5] Critical thinking [6]	 a. Overall professional work experience. The higher the overall professional work experience, the higher the extent of nursin competence across four scale dimensions [1,2,4,5]. The subgroups do neither differ terms of Ethical decision-making nor Critical thinking b. Basic nursing qualification Academically trained nurses have higher extents of nursing competence across five scale dimensions [1-5]. The subgroups do not differ in terms of Critical thinking
3. Cowan et al., 2007 (United Kingdom)	Comparison of nursing competencies of RNs who completed their basic nursing qualification in five different European countries	b. c. d.	Cross-sectional n=588 RNs 5 Subgroups: Basic nursing qualification completed in United Kingdom (UK), Greece (GR), Spain (ES), Belgium (BE), Germany (DE); Acute inpatient care Not reported	EHTAN Questionnaire Tool Assessment [1] Care delivery [2] Communication [3] Health promotion and illness prevention [4] Personal and professional development [5] Professional and ethical practice [6] Research and development [7] Teamworking [8]	 b. Basic nursing qualification Nursing competence (mean scores at total scale level) differs significantly depending on the country in which the RNs complete the basic nursing qualification (ranked by country, high to low): UK > ES > BE > D > GR; Dimension-specific competence scores (ranked by country, high to low, only descriptive data reported): [1]: UK > GR > ES > DE > BE [2]: UK > ES > BE > D > GR [3]: UK > ES > BE > DE > GR [3]: UK > ES > GR > BE > DE [5]: UK > ES > GR > BE > DE [6]: UK > GR > ES > BE > DE [7]: UK > GR > ES > BE > DE [7]: UK > GR > ES > BE > DE [8]: BE > UK > DE > ES > GR
4. Hamström et al., 2012 (Finland)	Influence of age, overall professional work experience, frequency of use of competencies in clinical practice, workplace rotation and employment status on nursing competence	b. с. d.	Cross-sectional n=148 RNs Age (in years/y): 2 clusters: <50y, >50y; Work experience (in years/y): 2 clusters: <10y, >10y; Workplace rotation: 2 clusters (yes/no); Employment status: 2 clusters: permanent/non- permanent; Acute inpatient and outpatient care Surgery	Nurse Competence Scale Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7]	 (a) Age (b) AG > DE > ES > OK <i>a. Age</i> The higher the age, the higher the extent of nursing competence across four scale dimensions [3,4,6,7]. The subgroups do neither differ in terms of Helping Role, Teaching-coaching nor Therapeutic interventions <i>a. Overall professional work experience</i> The higher the overall professional work experience. The higher the overall professional work experience, the higher the extent of nursir competence across four scale dimensions [3,4,6,7]. The subgroups do neither differ terms of Helping Role, Teaching-coachin nor Therapeutic interventions. <i>a. Frequency of use of competencies</i> Moderate to excellent correlations betwee self-assessed item-specific competence levels along with the increased frequency of using these competencies <i>c. Workplace rotation</i> Nurses with workplace rotation score higher on scale dimensions Managing situations and Ensuring quality. The

stuations and Ensuring quarty. The subgroups do not differ across five scale dimensions [1,2,3,5,7]. *e. Employment status* Permanently employed nurses score higher on the two scale dimensions Therapeutic

Author, Year (Country)	Study aims	a. Study designb. Study samplec. Subgroupsd. Care settinge. Nursing discipline	 a. Assessment instrument for estimating nursing competence b. Scale-specific competence dimensions [n_i] 	Influence factors on nursing competence a. Experience b. Qualification c. Professional working context d. Knowledge and skills (non-formal) e. Values, norms and rules
5. Hovland et al., 2018 (Norway)	Relationship between self- assessed nursing competence levels and the frequency of use of competencies	 a. Cross-sectional b. n=89 RNs c. none d. Municipal outpatient health care e. Outpatient home health care 	 a. Nurse Competence Scale b. Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7] 	interventions and Ensuring quality but not across scale dimensions [1,2,3,5,7]. <i>a. Frequency of use of competencies</i> Ranked extents of dimension-specific competence scores (dimension with highest extent to lowest) strongly differ from the ranked frequency of using the competencies per scale dimension Highest [#1] to lowest [#7] ranked competency dimensions vs. highest (1) to lowest (7) ranked frequencies of competencies used in clinical performance: [#1] Ensuring quality vs. (7) [#2] Diagnostic functions vs. (4) [#3] Therapeutic interventions vs. (5) [#4] Teaching-coaching vs. (6) [#5] Helping role vs. (1) [#6] Managing situations vs. (2)
6. Iacrossi et al., 2018 (Italy)	Influence of age, overall professional work experience, frequency of use of competencies in clinical practice and basic nursing qualification on nursing competence	 a. Cross-sectional b. n=70 RNs c. Age (in years/y): 2 clusters: <40y, >40y; Work experience (in years/y): 2 clusters: <15y, >15y; Qualification: 2 clusters: vocational vs. academical basic nursing education; d. Acute inpatient care e. Oncology 	 a. Nurse Competence Scale b. Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7] 	 [#7] Work role vs. (3) <i>a. Age</i> The higher the age, the higher the extent of nursing competence across three scale dimensions [1,4,6]. The subgroups do neither differ in terms of Teaching-coaching, Diagnostic functions, Therapeutic interventions nor Work role <i>a. Overall professional work experience</i> The higher the overall professional work experience, the higher the extent of nursing competence across two scale dimensions [1,4]. The subgroups do neither differ in terms of Teaching-coaching, Diagnostic functions, Therapeutic interventions, Ensuring quality nor Work role <i>a. Frequency of use of competencies</i> Frequency of using competencies are most commonly rated as median regarding scale dimensions [2,4,5,6] <i>b. Basic nursing qualification</i> Academically trained nurses and vocationally trained nurses do not differ in extents of nursing competence across six scale dimensions [1,2,3,5,6,7]. Vocationally trained nurses have significantly higher
7. Istomia et al., 2018 (Lithuania)	Influence of basic nursing qualification, non-formal professional training, frequency of use of competencies in clinical practice, experience of quality of care and experience of autonomy at the workplace on nursing competence	 a. Cross-sectional b. n=218 RNs c. Qualification: 2 clusters: vocational vs. academical basic nursing education; Non-formal professional training: 2 clusters (yes/no); d. Acute inpatient care e. Surgery 	 a. Nurse Competence Scale b. Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7] 	Managing situations <i>a. Frequency of use of competencies</i> Estimations regarding frequency of using competencies are directly proportional to the assessed extents of dimension-specific competences <i>b. Basic nursing qualification</i> Academically trained nurses' competence is significantly higher (mean scores at total scale level) than vocationally trained nurses' competence <i>d. Non-formal professional training</i> Nursing competence of nurses with additional non-formal professional training (e.g. training regarding clinical skills, communication, ethics, management) is significantly higher (mean scores at total scale level) than of those without further non-formal training <i>e. Experienced quality of care</i> Extents of dimension-specific nursing competence correlate with the experienced quality of care measured by the Good Nursing Care Scale for Nurses

Nursing Care Scale for Nurses e. Autonomy at workplace

Author, Year (Country)	Study aims	a. Study designb. Study samplec. Subgroupsd. Care settinge. Nursing discipline	 a. Assessment instrument for estimating nursing competence b. Scale-specific competence dimensions [n_i] 	Influence factors on nursing competence a. Experience b. Qualification c. Professional working context d. Knowledge and skills (non-formal) e. Values, norms and rules
8. Karlstedt et al., 2018 (Sweden)	Influence of age, overall professional work experience,	 a. Cross-sectional b. n=563 RNs c. Qualification: 2 clusters: 	 a. Nurse Competence Scale b. Helping role [1] Teaching-coaching [2] Diagnostic functions [3] 	Estimations regarding autonomy at workplace are directly proportional to the assessed extents of nursing competences at total scale level <i>a. Age</i> Positive linear correlation between the extent of nursing competence (mean score at total scale level) and the age (in years) of
	frequency of use of competencies in clinical practice and specialist nursing qualification on	postgraduation in specialist nursing education vs. non- specialist nursing education; d. outpatient long term care	Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7]	the RNs a. Overall professional work experience Positive linear correlation between the extent of nursing competence (mean score at total scale level) and the overall professional work experience (in years) of the RNs
	nursing competence	e. elderly care		a. Frequency of use of competencies Frequency of using competencies are most commonly rated as high regarding scale dimensions [1-5,7] and as median regarding scale dimension Ensuring quality (regardless of nurses' age, professional experience and qualification) b. Additional formal qualification Prevalence of total scale scores indicating "very satisfactory" nursing competence is significantly higher among postgraduate nurses with specialist nursing education than among those without specialist education
9. Meretoja et al., 2004b (Finland)	Influence of age, overall professional work experience, experience in actual professional nursing field/discipline and frequency of use of competencies in clinical practice on nursing competence	 a. Cross-sectional b. n=498 RNs c. none d. Acute inpatient and outpatient care e. Internal medicine, surgery, emergency, intensive care 	 a. Nurse Competence Scale b. Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7] 	 a. Age Positive linear correlation between the extent of nursing competence (mean score at total scale level) and the age (in years) of the RNs a. Overall professional work experience Positive linear correlation between the extent of nursing competence (mean score at total scale level) and the professional overall work experience (in years) of the RNs a. Work experience in current nursing area Positive linear correlation between the extent of nursing competence (mean score at total scale level) and the work experience in total scale level) and the RNS a. Work experience in current nursing area Positive linear correlation between the extent of nursing competence (mean score at total scale level) and the work experience in the current nursing area (in years) of the RNs a. Frequency of use of competencies Positive correlation between the frequency
10. Meretoja et al., 2004 (Finland)	Comparison of nursing competencies of RNs in different work environments and influence of age, overall professional work experience, experience, experience in actual professional nursing field/discipline and frequency of use of competencies in clinical practice	 a. Cross-sectional b. n=593 RNs c. Work environment of RNs: 4 clusters: Internal medicine/surgery ward (ISW) vs. emergency/outpatient department (EOD) vs. intensive care unit (ICU) vs. operating theater (OpT); d. Acute inpatient and outpatient care e. Internal medicine, surgery, emergency, intensive care 	 a. Nurse Competence Scale b. Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7] 	 Positive Correlation between the frequency of using competencies and the assessed extents of dimension-specific competences a. Age Positive linear correlation between the extent of nursing competence (mean score at total scale level) and the age (in years) of the RNs in each of the four work environments a. Overall professional work experience Positive linear correlation between the extent of nursing competence (mean score at total scale level) and the professional overall work experience (mean score at total scale level) and the professional overall work experience (in years) of the RNs in each of the four work environments a. Work experience in current nursing area Positive linear correlation between the extent of nursing competence (mean score at total scale level) and the work experience in the current nursing area

Author, Year (Country)	Study aims	b. c. d.	Study design Study sample Subgroups Care setting Nursing discipline	a. b.	Assessment instrument for estimating nursing competence Scale-specific competence dimensions [n _i]	Influence factors on nursing competence a. Experience b. Qualification c. Professional working context d. Knowledge and skills (non-formal) e. Values, norms and rules
	on nursing competence					Positive correlation between the frequency of using competencies and the assessed extents of dimension-specific competences in each of the four work environments <i>c. Nursing work environment</i> Nursing competence of nurses working in operation theater (mean scores at total scal level) is significantly lower compared to the RNs in the other three work environments (similar extents of nursing competence among the subgroups ISW, EOD, ICU at total scale level); The dimension-related extents of nursing competence differ between the subgroups, partially significantly: Helping role [1] and Ensuring quality [6] No significantly different competence levels among ISW, EOD and ICU, significantly lower in OpT compared to ISW Teaching-coaching [2] and Diagnostic functions [3]: No significantly different competence levels among ISW, EOD and ICU, significantly lower in OpT compared to ISW, EOD and ICU Managing situations [4]: No significantly different competence levels among ISW and ICU, but significantly higher levels in both EOD and OpT compared to ISW Therapeutic interventions [5] and Work role [7]: Similar extents of dimension-
11. Meretoja et al., 2015 (Finland)	Age group- specific comparison of nursing competence and influence of overall professional work experience, experience in actual professional nursing field/discipline, basic nursing qualification, frequency of use of competencies in clinical practice and employment status on age group-specific nursing competence	b. с. d.	Cross-sectional n= 2052 RNs Age (in years/y): 3 clusters: 20-29y, 30-39y, >39y; Acute inpatient and outpatient care Internal medicine, surgery, emergency, intensive care		Nurse Competence Scale Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7]	 specific competence across all subgroups <i>a. Age</i> The higher the age, the higher the extent of nursing competence. Levels of nursing competence differ significantly across all scale dimensions between the three subgroups <i>a. Overall professional work experience</i> Within each of the three age groups, a significant positive correlation between th extent of nursing competence and the RNs professional work experience is found (tot scale level) <i>a. Work experience in current nursing area</i> Within each of the three age groups, a significant positive correlation between th extent of nursing competence and the RNs professional work experience in current nursing <i>area</i> Within each of the three age groups, a significant positive correlation between th extent of nursing competence and the RNs work experience in their current nursing field/discipline is found (total scale level) <i>a. Frequency of use of competencies</i> Positive correlation between the frequency of using competencies and the assessed extents of dimension-specific competence within each of the three age groups <i>b. Basic nursing qualification</i> Academically trained nurses do not differ in extents of nursing competence within each of the three age groups, a negative correlation between the extent of nursing competence and the RNs' employment status is found (total scale
2. Numminen et al., 2017 (Finland)	Nursing competence development of newly graduated	b.	Longitudinal n= 318 RNs Work experience since time of		Nurse Competence Scale Helping role [1] Teaching-coaching [2] Diagnostic functions [3]	level) a. Overall professional work experience No significant changes in the extent of nursing competence (mean score at total scale level) and across particular scale

a. Overall professional work experience No significant changes in the extent of nursing competence (mean score at total scale level) and across particular scale

Nursing competence development of newly graduated a. Longitudinalb. n= 318 RNsc. Work experience since time of

a. Nurse Competence Scale
b. Helping role [1] Teaching-coaching [2] Diagnostic functions [3]

Author, Year (Country)	Study aims	b. с.	Care setting	Assessment instrument for estimating nursing competence Scale-specific competence dimensions [n _i]	Influence factors on nursing competence a. Experience b. Qualification c. Professional working context d. Knowledge and skills (non-formal) e. Values, norms and rules
	nurses and influence of overall professional work experience, practice environment, ethical climate, occupational commitment, empowerment, and time from graduation on nursing competence		graduation (in years/y): 1 cohort/3 times of data gathering (t1- t3): ≤1y, >1y & ≤2y, >2y & ≤3y; Public health care sector Not reported in detail	Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7]	 c. Paines, horns and Paies dimensions [1-4, 6,7] between t1 and t3. Significantly increased extents of nursing competence in dimension [6], Therapeutic interventions, respectively Additionally, shorter time from graduation and longer work experience are significant predictors for higher nursing competence <i>e. Empowerment</i> Empowerment, measured by the Qualities of an Empowered Nurse (QEN) Scale, is a significant predictor for higher nursing competence <i>e. Satisfaction with quality of care</i> Higher satisfaction with quality of care Higher satisfaction with duality of care e. Dissatisfaction with current job Increasing dissatisfaction with the current job is a predictor for higher nursing competence <i>e. Perceptions of practice environment</i> Perceptions of practice environment Scale of Nursing Work Index (PES-NWI), has no influence on the development of nursing competence <i>e. Ethical climate</i> Ethical climate Ethical climate Ethical climate Ethical climate Survey (HECS), has no influence on the development of nursing competence <i>e. Occupational commitment</i> Scale of nursing competence
13. Numminen et al., 2013 (Finland)	Comparison of RNs' nursing competence between four different nursing disciplines (internal medicine, surgery, pediatrics/ obstetrics/ gynecology, psychiatry) and influence of age, overall professional work experience, experience, experience in actual professional nursing discipline and frequency of use of competencies in clinical practice on nursing competence between and within the four disciplines	b. с.	Cross-sectional n=2083 RNs Age (in years/y): 5 clusters: 20-25y, 26-29y, 30- 39, 40-49y, >50y; Overall professional work experience (in years/y): 5 clusters: <1y, 1-3y, 4-9y, 10- 15, >15y; Experience in actual professional nursing discipline (in years/y): 5 clusters: <1y, 1-3y, 4-9y, 10- 15, >15y; Nursing disciplines of RNs: 4 clusters: Internal medicine (IM), Surgery (S), Pediatrics/ obstetrics/ gynecology (POG), Psychiatry (PSY); Acute inpatient and outpatient care Internal medicine, surgery, pediatrics/ obstetrics/ gynecology, psychiatry	Nurse Competence Scale Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7]	 a. Age Within each of the four nursing disciplines, low to moderate positive correlations between the extent of nursing competence on each scale dimension and the RNs' age are found a. Overall professional work experience Within each of the four nursing disciplines, low to moderate positive correlations between the extent of nursing competence on each scale dimension and the RNs' overall professional work experience are found a. Work experience in current nursing area Within each of the four nursing disciplines, low to moderate positive correlations between the extent of nursing competence on each scale dimension and the RNs' overall professional work experience are found a. Work experience in current nursing area Within each of the four nursing disciplines, low to moderate positive correlations between the extent of nursing competence on each scale dimension and the RNs' work experience in their current discipline are found a. Frequency of use of competencies Positive correlation between the frequency of using competencies and the assessed extents of dimension-specific competences in each of the four disciplines c. Nursing work environment Comparison of dimension-specific competences in each of the four disciplines c. Nursing work environment Comparison of dimension-specific competences in each of the four disciplines pediatrics/obstetrics/gynecology (POG) and Psychiatry (PSY) (ranked by discipline,

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				highest to lowest, all differences significant): Helping role: PSY > POG > IM > S Teaching-coaching: PSY > POG > IM > S Diagnostic functions: PSY > POG > IM > S Managing situations: PSY > POG > IM > S Therap. interventions: PSY > IM > POG > S Ensuring quality: PSY > POG > IM > S Work role: PSY > IM > POG > S
14. Salonen et al., 2007 (Finland)	Comparison of RNs' nursing competence between four different nursing settings (intensive care and emergency) and influence of age, experience in actual professional nursing setting and frequency of use of competencies in clinical practice on nursing competence	 a. Cross-sectional b. n=147 RNs c. Experience in actual professional nursing discipline (in years/y): 3 clusters: ≤1y, 1-3y, >3y; Nursing disciplines of RNs: 4 clusters: Intensive care unit, High dependency, ICU & HD combination, Emergency; d. Acute inpatient and outpatient care e. Intensive, high dependency and emergency care 	 a. Nurse Competence Scale b. Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7] 	 a. Age Significant correlation between the extent of nursing competence (mean score at total scale level) and the age (in years) of the RNs (entire sample) a. Work experience in current nursing area Significant correlation between the extent of nursing competence (mean score at total scale level) and the work experience in the current nursing area (in years) of the RNs (entire sample) a. Frequency of use of competencies Estimations regarding frequency of using competencies are directly proportional to the assessed extents of dimension-specific competences in six scale dimensions [1, 3-7] c. Nursing work environment Comparison of dimension-specific competence scores regarding Intensive care unit (ICU), High dependency (HD), ICU & HD combination (IH) and Emergency (E) (ranked by discipline, highest to lowest, only descriptive data presented): Helping role: ICU > HD > IH > E Teaching-coaching: HD > IH > ICU > E Diagnostic functions: HD > IH > E ICU Therap. interventions: HD > IH > E > ICU
15. Wangensteen et al., 2012 (Norway)	Comparison of nursing competencies of RNs in different care settings and influence of age, experience in health care before qualification on RN level, critical thinking and research utilization on nursing competence	 a. Cross-sectional b. n=620 RNs c. Work settings of RNs: 2 clusters: community health care vs. specialist health care; d. Acute and long term inpatient and outpatient care e. Long term care, home care, somatic and mental health 	 a. Nurse Competence Scale b. Helping role [1] Teaching-coaching [2] Diagnostic functions [3] Managing situations [4] Therapeutic interventions [5] Ensuring quality [6] Work role [7] 	 Work role: HD > IH > ICU > E <i>a. Age</i> Significant correlation between the extent of nursing competence (mean score at total scale level) and the age (in years) of the RNs (entire sample) <i>c. Nursing work environment</i> Nursing competence of nurses who work in community health care is significantly higher than of those working in specialist health care regarding scale three dimensions [3, 5,7] (Diagnostic functions, Therapeutic interventions and Work role) <i>d. Health care experience before professional training</i> Nursing competence of nurses who worked/practiced in health care before entering professional training is significantly higher than of those without health care experience before formal qualification on RN level regarding scale dimensions [3-5] (Diagnostic functions, Managing situations and Therapeutic interventions) and on mean scores at total scale level, respectively <i>e. Critical thinking</i>

e. Critical thinking Critical thinking, measured by the California Critical Thinking

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16. Willmann et al., 2012 (Sweden)	Nursing competence development of newly graduated nurses and influence of overall professional work experience on nursing competence	 a. Longitudinal b. n= 45 RNs c. Work experience since time of graduation (in months/m): cohort/4 times of data gathering (t1-t4): t1=2m, t2=5m, t3=9m, t4=15m; d. Acute inpatient care Internal medicine, surgery, pediatrics, gynecology, emergency, psychiatry, oncology 	 a. PROFFNurseSAS b. Direct clinical practice [1] Professional development [2] Ethical decision-making [3] Clinical leadership [4] Cooperation and consultation [5] Critical thinking [6] 	Disposition Inventory (CCTDI), is a significant predictor for nursing competence development <i>e. Research utilization</i> Research utilization, measured by the Research utilization Questionnaire, is a minor predictor for nursing competence development <i>a. Overall professional work experience</i> t1 to t2: No significant changes in the extent of nursing competence across scale dimensions [1-6] t2 to t3: Significant increase in the extent of nursing competence across scale dimensions Professional development and Critical thinking t3 to t4: Significant increase in the extent of nursing competence across all scale dimensions except the Critical thinking dimension (decreased extents of nursing competence in dimension [6])