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The quality of a model of nursing practice competency assessment in the labor room by applying an assessment center

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Abstract

This research aimed to: (1) study a model of nursing practice competency assessment in the labor room by applying an assessment center and (2) assess the quality of a model of nursing practice competency assessment. The participants consisted of 6 nursing instructors in obstetrics and gynecological nursing and 30 nursing students in the third and fourth years of the Bachelor of Nursing Science program from the Faculty of Nursing in Bangkok. The action research design was adopted in this research. Six instruments were used for data collection. Descriptive statistics were used to perform data analysis using EduG version 6.1-e. The results revealed that; (1) nursing students' scores on nursing practice skills and behaviors met the criteria of 80% and their scores on nursing practice knowledge also met the criterion of 60 percent (2) the inter-rater reliability of the nursing performance evaluation performed by nursing instructors was found at the highest level (3) the estimation of variance components for the G-study p×r×i design found relative and absolute decision coefficients equaling 0.7482 and 0.6767 in Station 1, 0.8962 and 0.8766 in Station 2, and 0.7417 and 0.6706 in Station 3 and the estimation of variance components for the G-study p×i design found relative and absolute decision coefficients equaling 0.4251 and 0.3737 in Station 4 (4) the D-Study (ρ^2_{Abs}) in Station 1–4 equaled 0.6767, 0.8766, 0.6706 and 0.3737, respectively and (5) the overall quality of an assessment model, consisting of the propriety, feasibility, utility and accuracy standards, was ranked at the highest level.

Introduction

Assessment of nursing students' competency in nursing practice is the key to nursing studies, which is an essential part of practical learning because it can assess and evaluate students' abilities in real-life settings (authentic assessment) (Sotiriadou, Logan, Daly, & Guest, 2019). To acquire the most reliable results that can be applied to the development and improvement in nursing students' practice, the competency assessment must be methodical, systematic, reliable and valid. The Thailand Nursing and Midwifery Council proposed core competencies of registered nurses and midwives for nursing bachelor graduates. Eight competencies were proposed, including Competency 2: Nursing and Midwifery Practice, which is related to nursing practice in the labor room. Nursing practice in the

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labor room is divided into 4 stages. In the first stage of labor, nurses take care of mothers in the labor room until the cervix is fully dilated or 10 cm. dilated. Nursing practice in this stage involves information gathering, physical examination, abdominal examination, pelvic examination, and labor monitoring, etc. The second stage of labor starts after the cervix is fully dilated until the baby is delivered. The third stage of labor commences with the delivery of the baby and ends with the delivery of the placenta and membranes. The fourth stage of labor involves nursing practice regarding the prevention of postpartum hemorrhage (Thailand Nursing and Midwifery Council, 2018).

Today, there are difficulties in assessing nursing practice competency in the labor room among nursing students due to problems presented by assessment methods or patterns, tools and criteria, and a continuous decline in the global pregnancy and normal birth rates (World Health Organization, 2015); as a result, nursing students have fewer times of practice in the labor room, leading to low performance scores (under 60) in midwifery courses (Hongranai & Usaha, 2012). A literature review conducted in this study suggests that assessment centers are suitable for nursing practice competency assessment in the labor room as they involve different types of assessment and several assessors and can be used to assess an individual in all aspects, i.e. knowledge, abilities, behaviors and attitudes. In addition, assessment centers provide training to assessors, focus on stimulating employees to develop skills needed to perform their jobs and assist in employees' personal development according to their competency levels through feedback given by assessors, that helps employees recognize and strengthen their weaknesses (Thornton & Rupp, 2006).

Accordingly, this research aimed to study a model of nursing practice competency assessment in the labor room by applying an assessment center, and assess the quality of a model of nursing practice competency assessment which was used to assess nursing students' skills, practice and knowledge in accordance with the Twelfth National Economic and Social Development Plan (2017–2021) (Office of the National Economic and Social Development Board, Office of the Prime Minister, 2019).

Literature Review

Assessment Centers (AC)

An assessment center consists of a standardized evaluation of behavior based on multiple inputs. AC can be used for multiple purposes. Most commonly, these purposes include prediction, diagnosis, and development.AC must be developed, implemented, and validated/evaluated in ways specific to the intended purpose of the program, and according to the talent management goals of the hosting organization.

All AC programs must contain 10 essential elements; (1) Systematic Analysis to Determine Job-Relevant Behavioral Constructs, (2) Behavioral Classification, (3) Multiple Assessment Center Components, (4) Linkages Between Behavioral Constructs and Assessment Center Components, (5) Simulation Exercises, (6) Assessors, (7) Assessor Training, (8) Recording and Scoring of Behaviors, (9) Data Integration, and (10) Standardization. (The International Taskforce on Assessment Center Guidelines, 2015).This research applied the 10 essential elements of AC to the development of a model of nursing practice competency assessment in the labor room consisting of assessment of nursing practice skills, behaviors and knowledge in the labor room, the simulation and preparation of realistic locations for assessment, and assessors' training in assessment methods and feedback giving which will enable nursing students to further develop and improve their nursing practice competency in the labor room.

Competency

Competency is defined as a measurable pattern of an individual's knowledge, skills, abilities, behaviors and other characteristics required for performing work roles or occupational functions successfully (Hailu, Ditta, & Zewdie, 2014). Many public and private organizations have adopted competencies as models for personnel management. In educational management, competency frameworks have been used to develop learners' skills. Various competency assessment methods are available to choose from, depending on the type of competency that needs to be assessed by an organization, such as document reviews, written tests, performance appraisals, work samples, assessment centers, in-basket simulations, behavioral assessments through situations and 360 degrees feedback.

Nursing Practice Competency in the Labor Room

The Australian Nursing and Midwifery Accreditation Council (2010), the Midwives Alliance of North America (2011) and the American College of Nurse-Midwives (2020) have determined core competencies for midwifery practice. During the first stage of labor, midwifery practice is divided into two parts: care for new admissions and care during labor. Midwifery practice in this stage involves information gathering, physical examination, abdominal examination, pelvic examination, assessment of uterine

contractions, fetal heart rate assessment, labor risk assessment, and general nursing care.The objective of midwifery practice during the second stage of labor is to ensure smooth delivery as well as maternal and newborn safety. Practical knowledge and skills regarding assessment of mothers, detection of placenta separation and placenta expulsion are required for midwifery practice during the third stage of labor. For the fourth stage of labor, knowledge and skills concerning examination of the placenta and fetal membranes, and postpartum care for mothers are required. To set global standards of midwifery practice, the World Health Organization (1999) has published the Standards of Midwifery Practice for Safe Motherhood.

Methodology

Participants

In this action research, the sample consisted of 6 nursing instructors in obstetrics and gynecological nursing with the responsibility of assessing nursing students during the nursing practice competency assessment (assessors), and 30 nursing students in the third and fourth years of the Bachelor of Nursing Science programs from nursing schools in Bangkok, that have been accredited by the Thailand Nursing and Midwifery Council for 5 years, whose nursing practice skills, behaviors and knowledge were assessed (assessee).

Ethical Considerations

Ethical approval for this study was obtained from the Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University (COA No. 176/2561) and the Research Ethics Committees, Faculty of Nursing, Mahidol University, Thailand (COA No. IRB-NS 2018/462.2610). All participants were informed of the study purpose and processes. When they agreed to participate, they were asked to complete and sign a consent form and had the right not to participate in the research. The researchers assured the participants that the data collected from them would be kept strictly confidential and codes would be used instead of their real names, and participants' identities would be kept confidential throughout the study.

Instruments

Six instruments were used for data collection: A model of nursing practice competency assessment in the labor room, a handbook for AC, simulations, nursing records, nursing performance evaluation forms, and a knowledge test. The instruments were developed by the researchers. The content validity of all instruments was reviewed by experts consisting of 5 instructors in measurement and evaluation, and 4 nursing instructors in obstetrics and gynecological nursing.

A model of nursing practice competency assessment in the labor room

A model of nursing practice competency assessment in the labor room was developed based on 10 essential elements of AC. The model was divided into 3 steps: preparation, process, and conclusion. The first step, preparation, consisted of (1) participants (assessors, assessees and standardized patients), (2) realistic labor rooms (Station 1–3) and (3) materials/equipment. The next step, process, consisted of nursing practice competency assessment, which comprised assessment of skills and behaviors in Station 1–3 (midwifery care during labor and birth) and assessment of knowledge in Station 4. In the last step, conclusion, feedback on competencies was provided to the assessee. The ratings of propriety and feasibility standards fluctuated between 4.00 and 4.89.

A handbook for AC

A handbook for AC consisted of a handbook for nursing instructors in obstetrics and gynecological nursing, nursing students, and standardized patients. The rating scale of quality fluctuated between 4.11 and 5.00.

Simulations

Simulations consisted of continuing situations used in Station 1, Station 2 and Station 3. The IOC fluctuated between 0.69 and 1.00.

Nursing records

Nursing records consisted of history records for Station 1, labor records for Station 2 and placenta assessment records for Station 3 for nursing students. The IOC fluctuated between 0.78 and 1.00.

Nursing performance evaluation forms

Nursing performance evaluation forms consisted of 3 different evaluation forms used by nursing instructors during the first stage of labor in Station 1, the second and third stages of labor in Station 2, and the fourth stage of labor in Station 3. The IOC fluctuated between 0.56 and 0.89.

A knowledge test

A knowledge test applied three levels of Bloom's Taxonomy of the Cognitive Domain (remembering, understanding and applying). The test consisted of 20

multiple-choice items (4 choices). The dichotomous scoring system (0, 1) was used with a total score of 20 points. The item difficulty and discrimination index were 0.2–0.8 and >0.2, respectively.The IOC fluctuated between 0.60 and 1.00.

Data Collection

The participants were selected using a purposive sampling technique and by inclusion criteria between February and May 2019. The procedures comprised 2 stages as follows; (1) the researchers provided information on the use of the developed competency assessment model by applying an assessment center to nursing instructors (assessors), nursing students (assessee) and standardized patients as well as preparing material models, equipment and realistic labor rooms with installed security cameras and (2) nursing students individually participated in the nursing practice competency assessment in the labor room by applying an assessment center which consisted of 4 stations (Figure 1). In Station 1–3, nursing practice skills and behaviors were assessed. Station 1 involved assessment of information gathering, physical examination, abdominal examination, pelvic examination and record-keeping (20 minutes). Station 2 involved assessment of delivery, placenta expulsion and record-keeping (15 minutes). Station 3 involved assessment of placental examination and record-keeping (5 minutes). Two nursing instructors were assigned to each station to assess nursing students through the security cameras. In Station 4, nursing students' knowledge was assessed through the computer-based knowledge test (20 minutes). After each completion of the assessment in Station 1, 2 and 3, nursing students received feedback from the assessors. In Station 4, feedback was given by the computer.

Data Analysis

1. The knowledge and practice scores were analyzed using descriptive statistics (mean and SD).

2.The inter-rater reliability score was obtained from the intra-class correlation coefficient (ICC) using the SPSS software package (SPSS Inc., Chicago, IL, USA).

3. The Generalizability Theory (G-theory) analysis and decision study (D-study) were performed using EduG version 6.1-e.

4. The quality of the developed competency assessment model was analyzed using descriptive statistics (mean and *SD*).

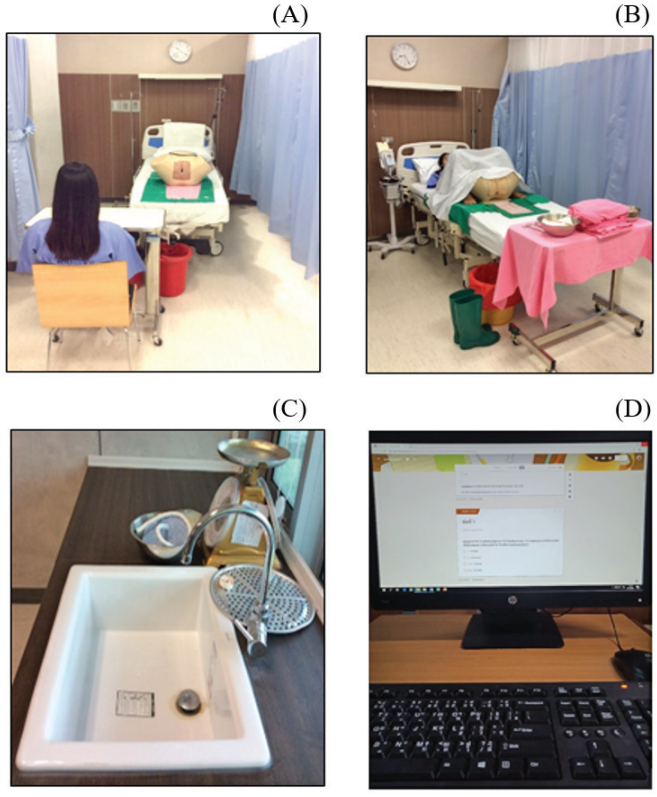

Figure 1 Labor room by applying an assessment center; (A) station 1, (B) station 2, (C) station 3 and (D) station 4

Table 1 Estimated variance components for the G-study p×r×i design

Source of variation	Station 1		Station 2		Station 3	
	Estimated variance component	% of total variance	Estimated variance component	% of total variance	Estimated variance component	% of total variance
p	0.00176	1.5	0.00757	6.6	0.00596	4.5
r	-0.00009	0.0	0.00000	0.0	-0.00004	0.0
i	0.02187	18.7	0.01848	16.2	0.03265	24.6
p x r	0.00009	0.1	0.00002	0.0	-0.00010	0.0
p x i	0.03028	25.9	0.08219	72.1	0.06893	51.9
r x i	0.00842	7.2	0.00005	0.0	0.00122	0.9
p x r x i, e	0.05444	46.6	0.00572	5.0	0.02413	18.2

Table 2 Estimated variance components for the G-study p×i design

Source of variation	Station 4	
	Estimated variance component	% of total variance
p	0.00643	2.9
i	0.04155	18.7
p x i, e	0.17397	78.4

Results

Scores on the Nursing Practice Competency Assessment in the Labor Room

The results showed that nursing students received the highest scores on the assessment of nursing practice skills and behaviors in the labor room related to delivery, placenta expulsion and record-keeping from a total score of 90 (M = 77.70, SD = 8.45), followed by care for new admissions and record-keeping from a total score of 70 (M = 58.63, SD = 2.98), and placenta examination and record-keeping from a total score of 30 (M = 24.28, SD = 2.86), and received the scores on the assessment of nursing practice knowledge from a total score of 20 (M = 13.50, SD = 2.46).

Analysis of Inter-Rater Reliability

For the inter-rater reliability in Station 1, Station 2 and Station 3, the ICC values equaled 0.918, 0.981 and 0.960, respectively. The inter-rater reliability was found at the highest level.

Analysis of True Score and Error Variances (*G-Study*)

Thirty nursing students were randomly selected for assessing the nursing performance evaluation forms used in Station 1–3 consisting of 105, 98, 39 items, respectively, by 2 nursing instructors (Table 1). The results showed that the relative and absolute decision coefficients equaled 0.7482 and 0.6767 (Station 1), 0.8962 and 0.8766 (Station 2), and 0.7417 and 0.6706 (Station 3), respectively. For assessing the knowledge test used in Station 4 consisting of 20 items, thirty nursing students were randomly selected (Table 2). The relative and absolute decision coefficients equaled 0.4251 and 0.3737, respectively.

Comparison of Generalizability Coefficients (D-Study)

The D-study in a measurement situation (G-Coefficients for p×r×i design) consisted of 2 measurement conditions*:* the number of assessors and the nursing performance evaluation forms as shown in Table 3–5. The D-study in a measurement situation (G-Coefficients for p×i design) consisted of 1 measurement condition*:* the number of items as shown in Table 6.

The quality of the developed competency assessment model comprised 4 determinants of Stufflebeam (accuracy, feasibility, utility and property). The overall quality was ranked at the highest level by nursing instructors (M = 4, SD = 0.21), experts (M = 4.79, SD = 0.29) and nursing students (M =4.69, SD = 0.27). The highest ranked quality determinant was utility (M = 5.00, SD = 0.00), followed by feasibility and property (M = 4.87, SD = 0.16) and accuracy (M = 4.83, SD = 0.41), respectively.

Table 3 The D-study in a measurement situation (G-Coefficients for p× r×i design) in station 1

Effect		Station 1: Estimated Variance Component in D-Study					
p x r x i	n_r	2	2	3	3	4	4
	n_i	105	140	105	140	105	140
	ρ^2 Rel	0.7482	0.7945	0.7818	0.8241	0.7998	0.8397
	ρ^2 Abs	0.6767	0.7328	0.7078	0.7612	0.7245	0.7762

Table 4 The D-study in a measurement situation (G-Coefficients for p×r×i design) in station 2

Effect		Station 2: Estimated Variance Component in D-Study					
p x r x i	n_r	1	1	1	2	2	2
	n_i	60	70	98	60	70	98
	ρ^2 Rel	0.8363	0.8561	0.8923	0.8415	0.8608	0.8962
	ρ^2 Abs	0.8087	0.8312	0.8729	0.8136	0.8357	0.8766

Table 5 The D-study in a measurement situation (G-Coefficients for p×r×i design) in station 3

Effect		Station 3: Estimated Variance Component in D-Study					
p x r x i	n_r	2	2	2	3	3	3
	n_i	39	50	60	39	50	60
	ρ^2 Rel	0.7417	0.7864	0.8154	0.7514	0.7948	0.8230
	ρ^2 Abs	0.6706	0.7230	0.7580	0.6789	0.7305	0.7648

Table 6 The D-study in a measurement situation (G-Coefficients for p×i design) in station 4

Effect		Station 4: Estimated Variance Component in D-Study					
p x i	n_i	20	40	50	60	70	80
	ρ^2 Rel	0.4251	0.5965	0.6489	0.6892	0.7213	0.7473
	ρ^2 Abs	0.3737	0.5441	0.5987	0.6416	0.6762	0.7048

Discussion

The findings of this study showed that most of the nursing students' scores on nursing practice skills and behaviors in the labor room met the criteria of 80 percent. Nursing students received the highest scores on delivery, placenta expulsion and record-keeping, followed by care for new admissions and record-keeping, and placenta examination and record-keeping. Their scores on nursing practice knowledge also passed the criteria of 60 percent. The results are consistent with the Thailand Nursing and Midwifery Council's criteria for core competencies of registered nurses and midwives that require all nursing graduates to pass the examination with a score of at least 60 percent (Thailand Nursing and Midwifery Council, 2018) to guarantee that nursing graduates have sufficient skills and knowledge for the nursing profession in accordance with the nursing standards issued by the Thailand Nursing and Midwifery Council to protect the rights and benefits of patients (Chansuvarn, Noparoojjinda, & Jaiyungyuen, 2016).Their nursing practice competency in the labor room must be continuously developed and improved to ensure the safeness of both the mother and the child. However, scores on nursing practice knowledge and scores on nursing practice skills and behaviors may not be consistent. A study by Blackman and colleagues (2012) revealed that academic achievement had no direct effect on the outcomes of nursing practice in clinics. In addition, a study by Wattananon et al. (2016) found no significant relationship between scores on nursing practice skills and behaviors consisting of new admissions, fetal delivery, placental delivery and examination, and record-keeping, and scores on nursing practice knowledge at a significant level of .05.

The relative and absolute decision coefficients should be greater than 0.80 (Cunningham, Wright, & Baird, 2015), which represents almost perfect agreement (Landis & Kock, 1977). The number of samples affects the generalizability coefficients (Atilgan, 2013).

To determine the generalizability coefficients (D-study), the following analysis results should be selected for the first three stations: 3 assessors and 140 items, 1 assessor and 60 items, and 2 assessors and 60 items, respectively. However, previous studies found no clear pattern of increase or decrease in the number of assessors;

it depends on the required level of reliability (Kamus & Dogan, 2018). For the last station, 80 items should be selected in order to acquire a knowledge score with the required level of reliability (Kanjanawasee, 2012).

Regarding the quality assessment of the developed competency assessment model, Laboonkam and Srisa-ard (2017) suggested that the quality of evaluations should be assessed in accordance with the Joint Committee on Standards for Education Evaluation consisting of propriety, feasibility, utility and accuracy standards. It is consistent with a study led by Burachat, Phanphurk, and Siribanpitak (2011) which indicated that evaluations should meet the four quality standards: propriety, feasibility, utility and accuracy.

Conclusion and Recommendation

The developed model of nursing practice competency assessment in the labor room by applying an assessment center in this research met the four evaluation standards by Stufflebeam (accuracy, feasibility, utility and property) at the highest levels, which indicates that the developed competency assessment model is standardized and able to produce accurate and reliable results, which can be used further in the development and improvement in nursing students' practice. To achieve the maximum benefits, training should be given to assessors to set the evaluation standards before using the assessment model. Model trials and assessment of inter-rater reliability or intra-rater reliability should also be conducted. To determine the number of assessors and the number of items used in the competency assessment of nursing practice skills, behaviors and knowledge, the generalizability coefficients of greater than 0.80 and the resources and time of an institution should be taken into account.

Future studies should consider other assessment situations/conditions such as sources, assessors, preceptors, peers working together and the number of occasions in order to obtain the generalizability coefficients leading to the selection of situations or conditions with the lowest standard deviation and the highest reliability of an assessment. A confounded design that is a combination of a crossed and nested design such as p x (r:o) design, and simulations of abnormal labor or labor complications should be applied to the nursing practice competency assessment in the labor room to help nursing students further develop decision-making, problem-solving and analytical skills.

Conflict of Interest

There is no conflict of interest.

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References

American College of Nurse-Midwives. (2020). *Core competencies for basic midwifery practice*. Retrieved from https://www.midwife.org/acnm/files/acnmlibrarydata/uploadfilename/000000000050/ACNMCoreCompetenciesMar2020_final.pdf

Atilgan, H. (2013). Sample size for estimation of G and Phi coefficients in generalizability theory. *Eurasian Journal of Educational Research*, *13*(51), 215–228.

Australian Nursing and Midwifery Accreditation Council. (2010). *National competency standards for the midwife*. Retrieved from https://www.nursingmidwiferyboard.gov.au/codes-guidelines-statements/professional-standards.aspx

Burachat, S., Phanphurk, S., & Siribanpitak, P. (2011). Research and development of graduate quality evaluation model for teacher education program of higher education institutions. *KKU Research Journal (Graduate Studies)*, *11*(4), 101–112. [in Thai]

Chansuvarn, S., Noparoojjinda, S, & Jaiyungyuen, U. (2016). Factors related to the result of nursing licensure examination among bachelor graduates from Boromarajonani College of Nursing, Suphanburi. *Journal of Nursing and Education*, *9*(2), 81–92. [in Thai].

Cunningham, J., Wright, C., & Baird, M. (2015). Managing clinical education through understanding key principles. *Radiologic Technology*, *86*(3), 257–273.

Hailu, A., Ditta, H., & Zewdie, Z. (2014). Competency assessment and factors associated with it among health professionals at Debre Birhan health science college. *Open Journal of Nursing*, *4*, 493–500. doi: 10.4236/ojn.2014.47052

Hongranai, S., & Usaha, N. (2012). Factors influencing learning achievement of nursing science students in maternal-child nursing and midwifery 1 course of Suan Dusit Rajabhat University. *SDU Research Journal*, *8*(2), 77–89. [in Thai]

Kamus, O., & Dogan, C. D. (2018). An investigation of reliability coefficients estimated for decision studies in generalizability theory. *Journal of Education and Learning*, *7*(4), 103–113. doi: 10.5539/jel.v7n4p103

Kanjanawasee, S. (2012). *Modern test theories* (4th ed.). Bangkok, Thailand: Chulalongkorn University. [in Thai].

Laboonkam, A., & Srisa-ard, B. (2017). A development of internal quality assessment model of faculty of forestry science national university of Lao. *Journal of Educational Measurement Mahasarakham University*, *23*(2), 243–253. [in Thai].

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, *33*(1), 159–174. doi: 10.2307/2529310

Midwives Alliance of North America. (2011). *Core competencies for basic midwifery practice*. Retrieved from https://mana.org/pdfs/MANACoreCompetenciesColor.pdf

Office of the National Economic and Social Development Board, Office of the Prime Minister. (2019). *The Twelfth National Economic and Social Development Plan 2017–2021*. Retrieved from https://www.nesdc.go.th/ewt_dl_link.php?%20nid=6422 [in Thai]

Sotiriadou, P., Logan, D., Daly, A., & Guest, R. (2019). The role of authentic assessment to preserve academic integrity and promote skill development and employability. *Studies in Higher Education*, *45*(11), 2132–2148. doi: 10.1080/03075079.2019.1582015

The International Taskforce on Assessment Center Guidelines. (2015). Guidelines and ethical considerations for assessment center operations. *Journal of Management*, *41*(4), 1244–1273. doi: 10.1177/0149206314567780

Thailand Nursing and Midwifery Council. (2018). *Nursing council announcement subject: Primary competencies of graduates with a bachelor's degree, master's degree, and doctorate degree in nursing advanced nursing training course at the diploma level and receiving a diploma/letter of approval for specialized expertise in nursing and midwifery and nursing specialty*. Retrieved from https://www.tnmc.or.th/news/124 [in Thai]

Thornton, G. C., & Rupp, D. E. (2006). *Assessment centers in human resources management: Strategies for prediction, diagnosis, and development*. New York, NY: Psychology Press.

Wattananon, Y., Purksametanun, T., Ngueychareon, G., Wannasathid, V., Jittima, V., & Hungsawanus, P. (2016). Learning outcomes of clinical teaching based on D. Cecco concept: Normal labour. *Journal of Nursing Science*, *34*(3), 19–29. [in Thai]

World Health Organization. (1999). *Standards of midwifery practice for safe motherhood*. New Delhi, India: World Health Organization.

World Health Organization. (2015). *Statement on caesarean section rates 2015*. Retrieved from https://www.who.int/reproductivehealth/publications/maternal_perinatal_health/cs-statement/en/