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Assessment of Validity and Reliability of the Arabic Nursing Core Competencies Scale-70

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Abstract:

Aim and Objectives: The present study aims to provide an Arabic version scale that is valid and reliable to be used in Arabic countries to assess the level of competencies as it has become a prerequisite for nurses' high-quality performance.

Background: Nursing is the profession that holds the health of individuals across life journey. Nurses' responsibilities are varied based on their specialties, but the main role is to support those who are in need for healthcare.

Design: A methodological multi-countries study.

Methods: the study is conducted on Iraqi and Jordanian hospitals from September, 6th, 2019 to September, 30th, 2021.

Participants' Contribution: there is no patients or public contribution, there is only nurses, because the study is focused on their core competencies, not on patients or public persons. After the ethical consideration taken into consideration, nurses who completed the survey were 225; surveys with incomplete information were excluded and the total number left for the study were 217 nurses; male nurses were 132 and female nurses were 85.

Results: The study results show that all the calculated values of the reliability parameters (Cronbach's Alpha=0.932, Correlation Between Forms=0.856, Spearman-Brown Coefficient=0.922, and Guttmann Split-Half Coefficient=0.918) were within the higher reliability range. Additionally, the results indicate that the scale items can collected in five domains according to its direction with a maximum determined variance. The scale domains are including the Human understanding and communication skills; Professional attitudes; Critical thinking and evaluation; General clinical performance; and Specific clinical performance.

Conclusions: The ANCCS is a valid and reliable scale for measuring the nurses' core competencies in clinical practice, and it is easy to use by students, educators, administrators, and clinical personnel. It is highly recommended for nurses to use the ANCCS as a self-evaluation tool to maintain and improve their practice by identifying their strength and areas of improvement.

Relevance to Clinical Practice
Nurses' core competencies are a fundamental concept in nursing, it reflects the quality of nursing care. Furthermore, health care systems can integrate the core competencies of ANCCS in their quality system to evaluate or to motivate nurses in specified and unified evidence-based items. As a conclusion; it has been determined that the ANCCS can be used for specifying nurse's competency level in Arabic population.

Keywords: Assessment, Nurses, Core Competencies, Arabic Nursing Core Competencies Scale,

Aim and Objectives:

The present study aims to provide an Arabic version scale that is valid and reliable to be used in Arabic countries to assess the level of competencies as it has become a prerequisite for nurses' high-quality performance.

Introduction:

Nursing is the profession that holds the health of individuals across their life journey. Nurses' responsibilities are varied based on their specialties, but the main role is to support those who are in need for healthcare (American Nursing Association, 2018; Hoeve, Jansen, & Roodbol, 2014). The changes in the disease structure, birthrate, and mortality rate of communities have increased the demand for nurses with special competencies to effectively address the health needs of societies. Nursing competencies are a set of standards that guide nurses to be competent in protecting public health and providing safe and high-quality care services. It is crucial for nurses to have certain abilities that are considered as the core to fulfill their roles. Therefore, nurses should be prepared through curricula that nursing core competencies are clearly set as foundation for the curricula (Fukada, 2018).

In response to quantum leaps that have been achieved by many nursing programs around the globe, nursing education in Middle East has witnessed a transformative movement of substituting the traditional bio-medical syllabi by the competency-based curricula (Rossiter, & Brownie, 2018). This is the first driving force, which motivated the research team to design the current multi-site study. The second driving force is the literature gab that was confirmed by conducting a literature review of the published literature during the past five years both globally and regionally. Therefore, this study aims to provide an Arabic version scale that is valid and reliable to be used in Arabic countries to assess the level of competencies as it has become a prerequisite for nurses' high quality performance. Measuring the competency level of nurses through valid and reliable tool would have an important contribution in enhancing all the stakeholders' understanding, including however not limited to nurses, educators, administrators, and policy makers, and this could be a relatively new approach for nursing in Middle East.

The core competencies of nurses define the skills of the advanced practice, as well as the behaviors of nurses when caring for clients with varied health conditions. According to Chen (2010), "Core competency is vital to the nursing profession. Such helps guarantee the high quality and effectiveness of delivered care and maintains the social value and status of the nursing profession" (p.7). Moreover, in addition to physical health needs, migration phenomenon makes the world more diverse than ever, which increases the demand for spiritually and culturally sensitive nurses who value each individual and able to meet the health needs of patients (Al-Hawdrawi, 2017; Schilgen et al., 2017; Walani, 2015). Therefore, the need for multidimensional and more comprehensive instrument becomes crucial to evaluate the clinical performance of nurses. According to Leeuwen et al. (2009) and Kak et al. (2001), clinical performance of healthcare professionals and patients' health outcomes are strongly linked to the competency level of professional; since, poor performance skills are caused by low competence (Holanda, Marra, & Cunha, 2019). Furthermore, defining the important competencies through an objective tool helps nursing schools improving the clinical performance skills of their students. Based on the defined competencies, nursing schools can incorporate specific learning skills in their curricula and use more objective strategies to ensure valid measures. Learning skills include, but not limited to evidence-based

learning, critical thinking skills, problem-based learning (Chen, 2010), and cultural competent skills (Smith, 2018).

Study design:

Methodological design was used to maintain the reliability and validity of the translated Arabic version of the Korean Nurses' Core Competency Scale (KNCCS). The original scale is translated to Arabic in order to measure the core competencies of nurses in Arabic cultures. To maintain a random sample that represents the nurses' population, an online questionnaire was distributed using various social media platforms.

Methods:

The "Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0)" Guideline is used in reporting the present study (Ogrinc, et al., 2016)

The target population was nurses who graduated from four Iraqi universities and two Jordanian universities. Nurses who completed the survey were 225; surveys with incomplete information were excluded and the total number left for the study were 217 nurses; male nurses were 132 and female nurses were 85.

After the written permission was obtained from the original author (Kim, et al., 2017), the researchers adopted and translated the Korean Nurses' Core Competency Scale (KNCCS) written in English language. This scale was used for its comprehensibility value and validity score. The KNCCS is a 70-item scale with five subscales: human understanding and communication skills; professional attitudes; critical thinking and evaluation; general clinical performance; and specific clinical performance. The KNCCS uses a 1–5 Likert scale, with 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 =strongly agree. The Reliability of the KNCCS was reported as Cronbach's alpha of 0.97, the test-retest reliability alpha was reported as 0.84 for the total scale and 0.94, 0.92, 0.90, 00.91 and 0.84 (respectively) for the five subdomains (Lee et al., 2010). The original scale rated nurses' competency levels on a continuum 1= least competent to 5= most competent.

However, the "Benner's stages of clinical competence" is used to rate the proficiency or the competency levels of nurses measured by the Arabic version of the nurses' core competency scale (ANCCS). The Benner's stages are divided into five stages, which are: novice, advanced beginner, competent, proficient, and expert. According to Benner, novice nurses has no experience to perform in a clinical practice. Advanced beginners are those who show acceptable practice. Competent stage is for nurses who demonstrate efficiency and confidence in their nursing actions. Proficient stage describes nurses who demonstrate wholeness in dealing with situations, set their long-term goal base on the understanding to meaning of the situation, and learn from their experience when to modify their care plan based on the expected situation. Finally, expert stage describes nurses who demonstrate high proficiency and higher analytical skills for unexpected situations. Proficient nurses act base on their deep understanding to the whole situation (Benner, 1984).

Forward and backward translation and cultural adaptation were used to translate the scale from the English to Arabic language. The translation was performed independently by three bilingual translators. The translators have Ph.D. in nursing and have more than 10 years of experience in nursing education and clinical practice. The Arabic version was translated back to English by other two bilingual translators who also have PhD in nursing and live about five years in English speaking counties. Then, the two forms, forward and backward translation, were reviewed by the authors; the Arabic version that was closest to the original scale after it was translated back to English was used for the current study.

Content validity was used to validate the nurses core competency scale after it was translated to Arabic. The Arabic version was critically reviewed by a panel of nursing education expert for its content. According to their recommendation, some modification was carried out without changes to the themes on items. Experts were selected from different nursing schools who have experts in nursing education and nursing practice. Experts were asked to rate each item on the scale of 1-to- 4, in which that 1= "the item is not related"; 2 = "the item is not essential"; 3 = "the item is necessary"; 4 = "the item is essential to measure the nurses' core competencies". The content validity ratio (CVR) was calculated for each item on the Arabic competency scale based on the experts

rating; items that were rated as “essential” or “necessary” were given a score of “1”, and items that were rated as “not essential” or “not related” were given a score of “zero”. The content validity index (CVI) for the total items was measured using the mean of the total items’ CVR. The acceptable value for CVR is 0.78 for items reviewed by three or more experts. According to Gilbert and Prion (2016), the CVI for the entire scale is acceptable at the value of 0.70 and the value of 0.80 is preferred. The CVI for the entire scale is above the acceptable value, which indicates that the ANCCS is valid with a high CVI 0.90.

In order to assess the psychometric properties of the KNCCS Arabic. Statistical analyses were performed using Statistical Package for Social Sciences (SPSS) for Windows version 20. Frequency and percentage were used to summarize the demographic variables and job-related data. The reliability of the scale is determined using the Cronbach's Alpha analysis, Correlation Between Forms, Spearman-Brown Coefficient, and Guttmann Split-Half Coefficient with minimum accepted level of 0.70. Before conducted the factor analysis for the ANCCS, the suitability of data for factor analysis was determined using the Kaiser-Meyer-Olkin/ Bartlett's test of sphericity. The factor analysis, principle components method of items' extraction, was also used to calculate the initial eigenvalues for the extracted components.

The ethical consideration was achieved through two phases; first, the researchers obtained a written permission from the original author to use the “Korean Nurses’ Core Competency Scale”. Second, the researcher obtained participation approval from the study participants to be included in the study. The study participants were informed about the study and its objectives. Also, participants were informed that their participation was voluntary and the information will be used for the research purposes only.

Results:

In a profession like nursing, which strives to advocate the best for human being’s life, the maximum level of professional competency is the norm. Failing to provide such level of professional competency can jeopardize the inner core values of nursing, which are however not limited to caring, integrity, diversity, and most importantly excellence (Al-Banna, 2017). Therefore, it is imperative for nurses to be armed with certain capacities that are considered as the core to fulfill their challenging and complex professional roles. This justified this research endeavor as it aims basically at testing the psychometric properties of KNCCS that by which the interested parties would be able to assess newly gradated nurses core competencies and to compare different nursing curricula in preparing competent nurses in an Arabic-speaking Middle-Eastern countries. The outcome of such an important research-based assessment is valuable in judging the quality of the targeted nursing school graduates.

Nursing theories are helpful in terms of drawing a roadmap for better and clearer understanding to the phenomenon under investigation. Therefore, a theoretical framework of this research endeavor is mandatory. Reviewing the theoretical literature of professional nursing indicated that no one conclusive theoretical statement fits all nurses, in all settings, fields of professional nursing, and cultures (Hird, 1995). However, competency as a main concept in this article is first introduce by Benner (1984) “From Novice to Expert theory”, whereas its theoretical underpinnings are closely related to the competency-based curriculum as an emerging approach in the Middle-East. It is a challenging journey that has many stations, including novice, advanced beginner, competent, proficient, and the final destination would be actualized when being an expert, that all nursing schools across the world strive to achieve. Another theory that can explain any variations in nurse’s attainment of their basic core competencies would be Bandura’s self-efficacy theory. The basic theoretical underpinning of the aforementioned theory is “the belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations” (Bandura 1995, p. 2). Such a belief is essential in explaining any variations in nurse’s attainment of their basic core competencies based on every person’s goal setting and his/her determination in accomplishing them (Bandura, 1995).

Scientific literature on the research tool’s quality presents that verified evidences of its validity and reliability, which would be helpful for all the interested parties choosing the suitable tool to use. Validity and reliability are the chief measurement characteristics of such tools; whereas validity represents the level of a tool to determine precisely what it intends. Reliability on the other hand refers to the capacity to replicate an outcome

constantly across the time and space (Souza, Alexandre, & Guirardello, 2017). Therefore, it is essential to use both reliable and valid tool to effectively assess the aforementioned competencies.

Table (3). **Reliability statistics for scale domains**

All the calculated values of the reliability parameters (Cronbach's Alpha=0.932, Correlation Between Forms=0.856, Spearman-Brown Coefficient=0.922, and Guttmann Split-Half Coefficient=0.918) were within the higher reliability range. Whereas alpha values were described as reliable if it is (0.84–0.90), Correlation Between Forms, Spearman-Brown, and Coefficient Guttmann Split-Half Coefficient (0.90 to 1.00) (Taber, 2018; Mukaka, 2012; Akoglu, 2018; Schober, Boer, & Schwarte, 2018). Such values suggest that KNCCS has good psychometric properties when used on an Arabic language speaking population.

Using this valid and reliable tool to quantify an Arabic language speaking nurse's core competency is a direct indicator that by which the interested parties can measure their capacities to execute nursing responsibilities at a proficient level (Lee, et al., 2017). Such a core competency incorporates fundamental behavioral qualities in addition to conquering of advanced practice qualities; which includes however not limited to, effective communication, critical thinking skills, self-development capacities, collaboration, leadership, and management capacities (Chen, 2010).

Table (4). Reliability statistics for scale domains

The results indicate that all the suggested domains are reliable to measure the nurses' core competencies at any time in the future for the same population. Cronbach's Alpha was ≥0.90, whereas alpha values were described as reliable if it is (0.70–0.90).

Table (5). Suitability of the data for factors analysis

The results of such an important statistical procedure indicated that the collected data are suitable for factor analysis at p-value less than 0.0001. Whereas, Kaiser-Meyer-Olkin Measure of Sampling Adequacy= 0.864. Bartlett's Test of Sphericity: X2 (2415, N = 217) = 8486.844, p = 0.0001.

Table (6). Principle components method of items' extraction with Eigenvalues.

The results indicated that the scale items can collected in five domains according to its direction with a maximum determined variance. Whereas component 1 explained 37.270% of variance, while component 5 explained 2.661% of variance.

Conclusions:

In conclusion, the findings indicated that the KNCCS is a valuable instrument with acceptable psychometric properties to assess the core competencies of nurses in an Arabic-speaking Middle-Eastern countries. Additionally, this article presents empirical evidence on the validity and reliability of ANCCS.

As a demand for health care system increases in the Middle East region. Development of Arabic nursing competency scale is essential to prepare nursing workforce for the current and upcoming complex challenges. The ANCCS is easy to use by students, educators, administrators, and clinical personnel. In addition to potentiality of using the ANCCS as a self-evaluation tool by nurses to maintain and improve their practice by identifying their strength and areas of improvement, the ANCCS can be used by higher educational institutions to build, modify and to enrich nursing curriculum through adopting the finding of this research.

Relevance to Clinical Practice

Nurses' core competencies are a fundamental concept in nursing, it reflects the quality of nursing care. Furthermore, health care systems can integrate the core competencies of ANCCS in their quality system to evaluate or to motivate nurses in specified and unified evidence-based items. As a conclusion; it has been determined that the ANCCS can be used for specifying nurse's competency level in Arabic population.

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Tables:

Table1. Demographic variables of study sample

Demographic data	Rating and intervals	Frequency	Percent
Gender	Male	132	60.8
	Female	85	39.2
Age / years	<= 24	48	22.1
	25 - 29	110	50.7
	30 - 34	23	10.6
	35 - 39	25	11.5
	40+	11	5.1
University	Baghdad	63	29.0
	Al-Zaytoonah	17	7.8
	Al-Kufa	51	23.5
	Karbala	38	17.5
	Babylon	45	20.7

	Al-Hashemite	3	1.4
University Type	Governmental	199	91.7
	Private	18	8.3
Interest in nursing	No	83	38.2
	Yes	134	61.8
Graduation Grade Point Average (GPA)	<= 59	5	2.3
	60 - 69	50	23.0
	70 - 79	91	41.9
	80 - 89	62	28.6
	90+	9	4.1
Graduation year	2004 - 2006	9	4.1
	2007 - 2009	7	3.2
	2010 - 2012	25	11.5
	2013 - 2015	60	27.6
	2016+	116	53.5

Table2. Professional characteristics of study sample

Demographic data	**Rating and intervals**	**Frequency**	**Percent**
Years of experience	<= 3	122	56.2
	4 - 6	45	20.7
	7 - 9	17	7.8
	10 - 12	12	5.5
	13+	21	9.7
Nurse/patients ratio	1:1	19	8.8
	1:2	49	22.6
	1:3	41	18.9
	1:4	34	15.7
	1:5	17	7.8
	1:6	14	6.5
	1:7	4	1.8
	1:8	6	2.8
	More than 1:8	33	15.2
Participation in training courses	No	63	29.0
	Yes	154	71.0
Interest to change their career	No	110	50.7
	Yes	107	49.3
Sufficiency of monthly income	No	164	75.6
	Yes	53	24.4

Table 3. Reliability analyses

Reliability techniques	**Values**
Cronbach's Alpha	0.932
Correlation Between Forms	0.856
Spearman-Brown Coefficient	0.922
Guttmann Split-Half Coefficient	0.918

Table 4. Reliability statistics for scale domains

Domains	N of Items	Cronbach's Alpha	Accepted reliability score
1. Human understanding and communication skills	21	.940	0.70
2. Professional attitudes	13	.910	0.70
3. Critical thinking and evaluation	14	.930	0.70
4. General clinical performance	13	.951	0.70
5. Specific clinical performance	9	.930	0.70

Table 5. Suitability of the data for factors analysis

Parameter		**Results**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.864
Bartlett's Test of Sphericity	Approx. Chi-Square	8486.844
	d.f.	2415
	Sig.	.0001

Table 6. Principle components method of items' extraction with Eigenvalues

Component		**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	17.887	37.270	37.270	17.887	37.270	37.270
	2	2.482	5.172	42.443	2.482	5.172	42.443
	3	1.711	3.565	46.008	1.711	3.565	46.008
	4	1.368	2.850	48.858	1.368	2.850	48.858
	5	1.277	2.661	51.519	1.277	2.661	51.519