Critical Care Nurses' Research Utilization and Competence Levels

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Abstract. Nurses' competency at critical care units is necessary to build their capacity in clinical decision making in the presence of life-threatening conditions. One of the major contributors to nurses' competency is research utilization (RU). It affects their evidence-based decision-making, empower them and improve the quality of care. The aim of the current study was to examine the levels of research utilization and perception of competence among critical care nurses in Jordan. A descriptive correlational design was used to collect data from 180 critical care nurses in four governmental hospitals in Jordan using a self-reported questionnaire comprised of the Research Utilization Questionnaire (RUQ) and Nurse Professional Competence Scale (NPC Scale). The study results showed that critical care nurses have a moderate level of research utilization (M = 3.4/5, SD = .7), and a moderate level of perceived competence (M = 64.6/100, SD = 14.2). Moreover, research utilization and levels of perceived competence have statistically significant relationship (r = .79, p < .0001). Further, the analysis revealed five significant predictors of nurses' perceived competence; age, years of nursing experience, years of experience in the unit, RU level, and research education or training at a university. In conclusion, research utilization is one of the factors that enhance critical care nurses' perceived competence, promoting excellence in health care, as well as, improving the quality of care and patients health outcome. It is recommended to include the research education at the basic nursing preparation programs as well as continuous nursing education programs.

Keywords: Research utilization · Competence · Nurses · Critical Care · Jordan

1 Introduction

Healthcare culture is shifting toward evidence-based decision-making in the intricate Critical Care Units (CCUs). Critical care nurses must provide high-quality patient care to improve patient outcomes [1]. Competency in critical care nurses is critical since

the specialization of critical care nursing necessitates the capacity to apply decision-making rapidly and efficiently in the face of life-threatening diseases [2]. Thus, utilization of research is regarded as a method of approaching evidence-based care in CCUs [3]. Although the healthcare environment of CCUs is complicated, the main goal is obtaining excellent health care that are safe, time-effective, efficient, equitable, and patient-centered [4].

The term "research utilization" (RU) refers to "The application of research findings in clinical practice and is considered the foundation of evidence-based practice" [5]. Evidently, RU has become the dominant care process model that has gained an appreciation for facilitating the use of research findings in clinical practice; it is related to equality between professional values, time, and available resources [6]. Although progress has been made in adopting RU as the standard of health care, this progress is still very slow and needs more work to promote RU as a daily practice in nursing [6].

Despite its importance, converting research into clinical practice is difficult. More than any other profession, nurses in CCUs are on the front lines of health care. As a result, nurse-led research is becoming more widely recognized as a critical pathway to practical and effective methods of improving patient outcomes. However, there are significant and growing barriers to collecting and translating research data [7, 8]. On the other hand, the complexity of patient requirements has made it clear that nurse competency standards must be revised and upgraded to achieve optimal health care outcomes [9]. In terms of the competency context, research reveals that nurses are aware of the necessity of ongoing education, professional networking, and acquiring extra information, such as evidence-based practice (EBP) expertise [10].

In Jordan, no official reports or publications are available to confirm or refute if nurses rely on traditional care or evidence-based care. Further, the state of research implementation in nursing practice is not yet known or even explored [11]. To our knowledge, there is a shortage of studies that have been undertaken in Jordan to evaluate the relationship between research utilization and perception of competency in CCUs among nurses. In CCUs, there is a greater emphasis on quality and safety in healthcare. This study expanded the corpus of knowledge in nursing working in CCUs by providing a better understanding of the relationship between RU and competence. Understanding this link may lead healthcare stakeholders and nursing managers to make adjustments that improve research usage, resulting in better nursing care and, eventually, better healthcare outcomes like decreasing the cost, decreasing the incidence of infection, decreasing the percentage of nosocomial infections, and decreasing the medical errors [12].

The current study aimed to examine the levels of research utilization and perception of competence among critical care nurses in Jordan and to explore the relationship between research utilization and perception of competence in Jordan.

2 Methodology

2.1 Research Design

A cross-sectional descriptive design was used to conduct the current study.

2.2 Study Setting and Sampling

Data were collected from four governmental hospitals in Jordan. The target population was all nurses who work in CCUs. Convenience sampling was used to recruit the participants at the selected hospitals. Total sample size was initially estimated to be 107 and calculated using the power analysis procedure described by Cohen [13]. The participants who were recruited met the following inclusion criteria: Jordanian registered nurses, work in CCU, at least one year of clinical experience, provide bedside care, and work full time.

2.3 Data Collection Procedure

The primary investigator met the directors of hospitals and then the head nurses of CCUs in the selected hospitals to have access to meet the participants. An electronic self-report questionnaire was used to collect data (using Google Forms). The link to reach the questionnaire was distributed as a QR code in nursing resting area and CCU stations. In the online form, an introduction paragraph was included clarifying the aim of the study, participants' rights and roles in the study, inclusion criteria, and a statement of consent to participate.

2.4 Ethical Considerations

Initially, the needed ethical approvals were obtained from the University of XXX and Ministry of Health. Participants were informed that their participation was entirely voluntary and that they had the right to withdraw from the study at any time without repercussions. All soft copies of materials agreement consent and questionnaires were kept anonymously and archived in highly confidential files in a personal computer of the primary investigator.

2.5 Instrumentation

Data collection instrument was composed of three parts. The demographic data sheet, the research utilization questionnaire, and thenurse professional competence scale. Demographic data sheet included age, gender, education level, experience in nursing and CCUs, marital status, unit of work, and hospital. Moreover, participants were also asked if they had any experience in research during their work.

Research Utilization Questionnaire
The Research utilization Questionnaire (RUQ) developed by Champion & Leach [14] was used. The RUQ consists of 38-item divided into three subscales; Attitudes toward research (21 items), Availability and support to implement research findings (7 items), and Research use in daily practice (10 items). The participants responded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), total score range between 38 and 190, a higher score indicating greater RU.

Nurse Professional Competence Scale
The nurse professional competence scale (NPC Scale-SF) was developed by Nilsson et al.

[15]. The NPCS consists of 35-item divided into six subscales Nursing Care (5 items), Value-based Nursing Care (5 items), Medical and Technical Care (6 items), Care Pedagogics (5 items), Documentation and Administration of Nursing Care (8 items), and Development, Leadership, and Organization of Nursing Care (6 items). The participants responded on a 7-point Likert scale ranging from 1 (to a very low degree) to 7 (to a very high degree). The range of the total sum score for each subscale is as follow: Nursing Care (5- 35); Value-based Nursing Care (5- 35); Medical and Technical Care (6- 42); Care Pedagogics (5–35); Documentation and Administration of Nursing Care (8–56), and Development, Leadership, and Organization of Nursing Care (6–42). Mean and standard deviation for the sixth competence areas were calculated and converted to a 14.3–100 scale, with a higher score indicating greater self-reported competence. The scale's reliability and validity were verified as Cronbach's alpha was reported to be more than 0.7 for all six subscales.

2.6 Data Analysis

The Statistical Package for Social Sciences software (SPSS version 25) was used for data processing and data analysis. Descriptive statistics described the participants and their scores in the used scales, Pearson correlation was used to examine the relationship between the levels of RU and the levels of perceived competence, student t-Test or ANOVA were used to examine the difference in the levels of RU and the levels of perceived competence according to organizational factors and personal factors. Lastly, multiple linear regression was used to associate perceived competence from organizational factors and personal factors.

3 Results

3.1 Characteristics of the Study Sample

Data were collected from a total of 180 nurses who work in CCUs. Table 1 shows the organizational and personal characteristics of participants. The total nursing experience was 8.8 years (SD = 5.1, Range 1–27), while the years of nursing experience at CCU was 5.3 years (SD = 3.6, Range 1–20). Seventy-four participants (41.1%) reported that they have a research experience during their work.

3.2 Research Utilization Levels

The mean scores of the RU scale and its subscales are presented in Table 2. The mean score of the participant's responses was 3.4 (SD = 0.7).

3.3 Perceived Competence Levels

The mean score of the perceived competence scale was calculated (Table 3). The average total score of the participant's responses was 64.6 (SD = 14.2). The highest scores was for "Value-Based Nursing Care" (65.5 ± 17.4), followed by the "Nursing Care" (64.8 ± 17.0). While the lowest scores were for "Documentation and Administration of Nursing Care" (63.5 ± 16.7).

Table 1. Description of Sample Characteristics (N = 180)

Variable	n (%)	M (SD)
Age		31.6 (5.0)
Gender		
Male	96 (53.3)	
Female	84 (46.7)	
Education level		
Bachelor	136 (75.6)	
Master	44 (24.4)	
Marital status		
Single	57 (31.7)	
Married	101 (56.1)	
Other	22 (12.2)	
Hospital		
Al-Bashir Hospital	68 (37.8)	
Al-Salt Hospital	39 (21.7)	
Prince Hussein governmental Hospital	40 (22.2)	
Zarqa Hospital	33 (18.3)	
Unit of Work		
Adult Critical Care	80 (44.4)	
Emergency Room	59 (32.8)	
Pediatric Critical Care Unit	41 (22.8)	
Research education or training at a university		
Yes	129 (71.7)	
No	51 (28.3)	
Research experience at work		
Yes	74 (41.1)	
No	106 (58.9)	

Table 2. Description of the RU (N = 180)

Variable	M (SD)	Range
Total RU	3.4 (0.7)	(1–5)
Attitudes to research	3.5 (0.8)	(1–5)
Availability of research	3.4 (0.8)	(1–5)
Research used	3.4 (0.8)	(1–5)

Table 3. Mean and Standard Deviation of Self-Reported Competence (N = 180).

Variable	M (SD)	Lowest score	Highest score
Perceived Competence	64.6 (16.3)	22.2	100
Nursing Care	64.8 (17.0)	14.3	100
Value-Based Nursing Care	65.5 (17.4)	14.3	100
Medical and Technical Care	64.5 (17.2)	16.8	100
Care Pedagogics	64.8 (16.5)	25.0	100
Documentation and Administration of Nursing Care	63.5 (16.7)	22.9	100
Development, Leadership, and Organization of Nursing Care	64.7 (16.9)	19.1	100

3.4 The Relationship Between the RU and Perceived Competence

A bivariate Pearson's correlation established that there was a strong, statistically significant positive linear relationship between RU and the levels of perceived competence, r (180) = .79, p < .0001.

3.5 The Differences in the RU and Perceived Competence Based on Participants' Attributes

As seen in Table 4, the participants who received research courses or training (M = 66.6, SD = 15.3) demonstrated statistically significant higher perceived competence level compared to the participants who didn't receive the research courses or training (M = 59.5, SD = 17.6), (t (178) = 2.7, p = .01). In investigating previous research experience at work, the results revealed statistically significant difference in RU levels, where nurses with previous research experience had significantly higher RU levels (M = 3.8, SD = 0.6) than nurses with no previous research experience (M = 3.1, SD = 0.6), (t (178) = 7.4, p < 0.001). Also, the results showed statistically significant (t (178) = 6.3, p < 0.001) difference in the perceived competence levels between nurses with previous research experience (M = 72.9, SD = 13.3) who have higher levels compared to nurses with no previous research experience (M = 58.8, SD = 15.6).

Pearson correlation test was utilized initially to test the relationship between RU level, perceived competence level and the study continuous variables. In terms of RU level, Table 5 shows there is a statistically significant moderate negative relationship between RU level and participant's age (r = −0.55, p < 0.001), while there was a weak positive statistically significant relationship between the RU level and years of nursing experience (r = 0.35, p < 0.001), and finally between the RU levels with years of experience at CCUs (r = 0.21, p < 0.001). Moreover, the results revealed that there is a statistically significant moderate negative relationship between perceived competence levels and participant's age (r = −0.54, p < 0.001) and a statistically significant moderate positive relationship between perceived competence levels and years of nursing

Table 4. Comparison of Research Utilization and Perceived Competence based on Categorical Organizational and Personal Characteristics (N = 180).

Variable	N	RU M (SD)	Perceived Competence M (SD)
Gender		(t = .55, p = .58)	(t = .98, p = .33)
Male	96	3.4 (.7)	63.5 (16.7)
Female	84	3.5 (.8)	65.9 (15.8)
Education degree		(t = .11, p = .91)	(t = .41, p = .69)
Bachelor	131	3.4 (.7)	64.3 (15.5)
Master	49	3.4 (.9)	65.5 (18.6)
Research education or training at university		(t = 1.6, p = .11)	(t = 2.7, p = .01)*
Yes	129	3.5 (0.7)	66.6 (15.4)
No	51	3.3 (0.8)	59.5 (17.6)
Research experience at work		(t = 7.4, p < 0.001)**	(t = 6.3, p < 0.001)**
Yes	74	3.8 (0.6)	72.9 (13.3)
No	106	3.1 (0.6)	58.2 (15.6)
Marital status		(F = 1.8, p = .16)	(F = 2.2, p = .11)
Single	57	3.5 (.6)	67.8 (13.5)
Married	101	3.3 (.8)	62.4 (17.7)
Others	22	3.5 (.6)	66.7 (15.2)
Uni1t of Work		(F = 1.4, p = .26)	(F = 2.4, p = .09)
Adult Critical Care	80	3.4 (.7)	61.9 (17.9)
Emergency Room	59	3.6 (.8)	65.5 (15.5)
Pediatric Critical Care Unit	41	3.4 (.7)	68.6 (13.1)

Note. * Significant at p < 0.05, ** Significant at p < 0.001.

experience (r = 0.42, p < 0.001). Meanwhile, there was a weak positive statistically significant relationship between the perceived competence levels with years of experience at CCUs (r = 0.30, p < 0.001).

3.6 Predictors of Perceived Competence

Assumptions of Multiple Linear Regression analysis were checked and met before the analysis. The multiple regression model was statistically significant, and predicted 70% of the variance in nurses' perceived competence, F (7, 172) = 54.1, p < .001. Adj. R^2 = .70. Five variables added statistically significant to the association, which are: research education or training at the university, age, years of nursing experience, years of experience in the unit, RU level, and research education or training at a university, p < .05. Regression coefficients and standard errors can be found in Table 6.

Table 5. Correlation between RU level, perceived competence level and continuous demographics (N = 180).

Variable	RU	Perceived Competence
	R	r
Age	-0.55^{**}	-0.54^{**}
Nursing exp. in years	0.35^{**}	0.42^{**}
Unit exp. in years	0.21^{**}	0.30^{**}

Note: ** Significant at $p < 0.001$.

Table 6. Predictors of Perceived Competence (N = 180).

Variable	B	SE	β	T	P-value
Age	-0.51	0.17	-0.16	-3.03	.01
Unit exp. in years	0.49	0.24	0.11	2.04	.04
Nursing exp. in years	0.36	0.17	0.11	2.08	.04
RU level	14.46	1.33	0.64	10.82	.01
Research education or training at a university	3.33	1.67	0.09	1.98	.04
Research experience at work	0.01	1.74	0.00	0.01	0.99
Hospital	-0.38	0.63	-0.03	-0.61	0.54

Note. $R^2 = 0.688$, Adjusted $R^2 = 0.675$

4 Discussion

4.1 RU Among Critical Care Nurses

Critical care nurses' responses indicated that they are engaged in research at 3.4 out of 5. Most of studies indicated varying levels of RU among nurses [16–18]. A possible explanation for this could be that RU is regarded as critical in providing quality healthcare and managing patient safety in health facilities [19]. Moreover, the results show that there was a strong statistically significant linear relationship between RU and the levels of perceived competence. The results agree with Jansson study [20]. This association could be explained by that evidence-based nursing requires the integration of research into clinical care, which is a challenge that is faced by nursing [21, 22].

The results showed that there was no significant difference in RU levels based on gender. This result was similar to Abuhammad et al. [23], and Hweidi et al. [24] results. This result could be related to the hospital's roles, guidelines, and work schedule with no discrimination based on gender [25]. Moreover, both female and male nurses experienced a high level of workload [26] which consequently affects RU. In terms of education degree, there was no significant difference between nurses who had a bachelor's degree

and participants who had a master's degree in nursing regarding RU levels. This result was comparable to those obtained by Abuhammad et al. [23], Hweidi et al. [24]. This can be related to the nursing curriculum that contains a research course on bachelor's and master's degrees.

The results of this study showed that there was no significant difference between RU levels and university research education or training. The results come in agreement with Hashish and Alsayed [27], and Moe and Enmarker [28] studies. This could be because the research education or training during university study was theoretical and not practical. Moreover, the results of this study revealed significant differences in RU levels according to research experience at work, experienced CCUs nurses had significantly higher RU levels than unexperienced nurses. The results are in line with many studies [29, 30]. This could be because nurses with research experience perceived fewer barriers to RU, particularly in searching for and comprehending research. Furthermore, through research activities, nurses gain the necessary knowledge and practices in information retrieval, statistical analysis, and research design, which facilitates RU.

In line with many studies of the literature, the current study showed that nurses' organizational and personal characteristics including age, years of nursing experience, and years of experience in the unit were significantly correlated with RU [7, 23, 31]. Older nurses had lower RU levels, which could be due to the fact that younger nurses still have up-to-date knowledge of research methods, statistics, and evidence-based practice [23]. Moreover, there was a positive association between the duration of experience and RU levels. This may be because nurses with more years of experience often have more management authority in hospitals, allowing them to carry out research findings in a clinical setting.

4.2 Perceived Competence Among Critical Care Nurses

The results showed that nurses who work at CCUs had a higher level of competency compared to other nurses. The results are in line with many literature studies [32, 33]. This could be due to the high technical and clinical skill requirements in CCUs. The critical care nurses rated their competence highest on items belonging to Nursing Care, and Value-Based Nursing Care. The results come in agreement with Halabi et al. [32]. This may be to the fact that the employed nurses are expected to be qualified and were recruited based on strict criteria related to these competency areas. Furthermore, nurses receive continuous and in-service education from the nursing department throughout the year in various areas related to patient care. On the other hand, the critical care nurses rated their competence lowest on items belonging to documentation and administration of nursing care. This may be due to Jordan's paper-based health record systems being still the dominant way of recording healthcare information [33]. Jordanian unpublished master's degree thesis investigated the performance expectancy, effort expectancy, social influence of the EHS, and the factors affecting the use of EHS among Jordanian nurses; the results showed that effort associated with EHS usage, management support, workload, and work unit were factors that may affect the nurses' behavior toward the EHS in terms of usage of the EHS [34].

The current study showed that there was no significant difference in nursing competence levels based on gender. This result was similar to those [20, 32] studies. This

result could be related to the fact that clinical competence is thought to be a skill that all nurses, male and female, should possess. In terms of education level, there were no significant differences were found between the perceived competence level of nurses with MSc and the nurses with BSc degrees. This result was similar to those obtained by Mirlashari et al. [35], and Faraji et al. [32]. Despite having more knowledge, nurses with MSc were dissatisfied with working conditions, particularly pay, and a high proportion of nurses with MSc in Jordan leave to work in other neighboring countries such as Gulf countries, as well as Canada and the United States, because these countries offer higher salaries, resulting in a nursing shortage locally [36]. All of these factors lowered the level of competency.

The results showed that nurses who received research training or had research experience demonstrated significantly higher perceived competence levels, maybe due to the effect of training on increasing nurses' confidence, nurses' knowledge of the pros and cons of the research, as well as increasing their critical thinking. Moreover, perceived competence levels were not statistically significantly different between different hospital groups. This could be related to the effect of workload and nurse shortages in all Jordanian hospitals [32, 34].

The results revealed that there is a statistically significant positive relationship between years of nursing experience and nurses' competencies. This result was similar to those obtained by Mirlashari et al. [35], Halabi et al. [32], and Rizany et al. [37]. Nursing work experience had a significant impact on enhancing nursing capabilities [38], which aided in the improvement of nurses' competencies. There was a significant negative association between age and level of competency. The results disagree with several studies that report positive association [32, 35]; which could be attributed to Jordanian nurses' dissatisfaction with working conditions such as pay, child care facilities, and professional growth and development [39].

4.3 Strengths and Limitations

This study has several strengths, including adequate sample size, study design appropriateness to purpose, and homogeneity of study setting. Despite its strength, the findings of this study have several limitations. First, the study employed a cross-sectional descriptive design, which limited the study's generalizability and the generation of any causal inferences. Second, because the data through a self-administered questionnaire, the subjective self-reported measurement might have induced a bias. Third, the study participants included intensive care nurses from only four Jordan's government hospitals, which did not cover all healthcare sectors in Jordan. Caution should be followed in generalizing the study findings.

4.4 Conclusions

The current study aimed to examine the levels of RU and perception of competence among critical care nurses in Jordan and to explore the relationship between RU and perception of competence in Jordan. The results of this study indicate a 3.4/5 (SD = .7) of RU and a 64.6 (SD = 14.2) of perceived competency among nurses in the critical care unit in Jordan. Moreover, the results showed that RU was associated with research experience

at work. The most significant factor associated with higher competence was research education or training at university and research experience at work. Research education or training at the university, age, years of nursing experience, years of experience in the unit, and RU level are unique associated with competence.

4.5   Recommendations and Implications to Nursing Practice

The results of the current study have important implications for nursing practice, and in light of the results obtained from the current study. Motivating healthcare stakeholders and nursing managers to understand the factors that affect RU, and competency; establishing continuous education programs and emphasizing the importance of a culture supporting RU; direct health care stakeholders and hospital managers to implement policy changes that help in better use for research and improving their competency; adopting research results in Jordanian healthcare institutions to enhance the practice environment and patient outcomes; providing nursing with all resources and techniques in CCUs to facilitate the use of the research; research skills, and research training.

Future studies are recommended to replicate this study to test the relationships among variables for other healthcare workers' samples, moreover, larger-scale studies at the government hospitals and in different healthcare sectors in Jordan, including educational hospitals, private hospitals, and military hospitals, are highly recommended. Finally, implementation of the journal club activity to help critical care nurses become more aware of current research studies and the best available evidence, as well as to keep them up to date on new findings, practices, and critical care trends.

References

1. Woo, B. F. Y., Lee, J. X. Y., & San Tam, W. W. (2017). The impact of the advanced practice nursing role on quality of care, clinical outcomes, patient satisfaction, and cost in the emergency and critical care settings: a systematic review. **Human resources for health**, 15(1), 1-22.
2. DeGrande, H. Liu, F. Greene, P. & Stankus, J.A. (2018). Developing professional competence among critical care nurses: An integrative review of literature. **Intensive and Critical Care Nursing**, 49, 65-71.
3. Dehghani, H. Heidari, F. Karimian Kakolaki, Z. & Salimi, T. (2014). Critical care nurses' knowledge, attitude, and practice in Yazd University of Medical Sciences' teaching hospitals on evidence-based nursing. **Community Health Journal**, 8(2), 56-64.
4. Craig, K.J.T. McKillop, M.M. Huang, H.T. George, J. Punwani, E.S. & Rhee, K.B. (2020). US hospital performance methodologies: a scoping review to identify opportunities for crossing the quality chasm. **BMC health services research**, 20(1), 1-13.
5. Thomas, A., & Law, M. (2013). Research utilization and evidence-based practice in occupational therapy: a scoping study. **American Journal of Occupational Therapy**, 67(4), e55-e65.
6. Tuppal, C. P., Vega, P. D., Ninobla, M. M. G., Reñosa, M. D., Al-Battashi, A., Arquiza, G., & Baua, E. P. (2019). Revisiting the barriers to and facilitators of research utilization in nursing: A systematic review. **Nurse Media Journal of Nursing**, 9(1), 90-102.
7. Da'seh, A., & Rababa, M. (2021). Military nurses' perspectives towards research utilization barriers. Heliyon, 7(10), e08181.

8. Sebopa, D. M. (2018). Barriers to research utilization as perceived by midwives in Community Health Centres in Gauteng (Doctoral dissertation, **North-West University**.

9. Meretoja, R., & Koponen, L. (2012). A systematic model to compare nurses' optimal and actual competencies in the clinical setting. **Journal of advanced nursing**, 68(2), 414-422.

10. Numminen, O., Leino-Kilpi, H., Isoaho, H., & Meretoja, R. (2015). Newly graduated nurses' competence and individual and organizational factors: A multivariate analysis. **Journal of Nursing Scholarship**, 47(5), 446-457.

11. Al Khalaileh, M. Al Qadire, M. Musa, A. S. Al-Khawaldeh, O. A. Al Qudah, H. & Alhabahbeh, A. (2016). Closing the Gap between Research Evidence and Clinical Practice: Jordanian Nurses' Perceived Barriers to Research Utilisation. **Journal of education and practice**, 7(8), 52-57.

12. Zegers, M., Hesselink, G., Geense, W., Vincent, C., & Wollersheim, H. (2016). Evidence-based interventions to reduce adverse events in hospitals: a systematic review of systematic reviews. **BMJ open**, 6(9), e012555.

13. Cohen, J. (1992). Statistical power analysis. Current directions in psychological science, 1(3), 98-101.

14. Champion, V.L. & Leach, A. (1989). Variables related to research utilization in nursing: an empirical investigation. **Journal of advanced nursing**, 14(9), 705-710.

15. Nilsson, J., Engström, M., Florin, J., Gardulf, A., & Carlsson, M. (2018). A short version of the nurse professional competence scale for measuring nurses' self-reported competence. **Nurse education today**, 71, 233-239.

16. Aljezawi, M. Al Qadire, M. Alhajjy, M.H. Tawalbeh, L.I. Alamery, A.H. Aloush, S. & ALBashtawy, M. (2019). Barriers to integrating research into clinical nursing practice. **Journal of nursing care quality**, 34(3), E7-E11.

17. Hendricks, J., & Cope, V. (2017). Research is not a 'scary' word: Registered nurses and the barriers to research utilization. **Nordic Journal of Nursing Research**, 37(1), 44-50.

18. Ross, J. G., & Burrell, S. A. (2019). Nursing students' attitudes toward research: An integrative review. **Nurse Education Today**, 82, 79-87.

19. Dagne, A.H. & Ayalew, M.M. (2020). Factors affecting research utilisation of nurses and midwives working in North Gondar and West Gojjam Zone public hospitals, Ethiopia: a cross-sectional study. **BMJ open**, 10(11), e039586.

20. Jansson, J., Eklund, A. J., Larsson, M., & Nilsson, J. (2020). Prehospital care nurses' self reported competence: A cross-sectional study. International emergency nursing, 52, 100896.

21. Grant H, Stuhlmacher A, Bonte-Eley S. (2012) Overcoming barriers to research utilization and evidence-based practice among staff nurses. **Journal for Nurses in Staff Development**, 28(4):163–5.

22. Yoder LH, Kirkley D, McFall DC, Kirksey K, StalBaum A, Sellers D. (2014). CE: Original Research: Staff nurses' use of research to facilitate evidence-based practice. **AJN The American Journal of Nursing**, 114(9), 26-37

23. Abuhammad, S. Alzoubi, K. Khabour, O. & Mukattash, T. (2020). Jordanian national study of nurses' barriers and predictors for research utilization in clinical settings. **Risk Management and Healthcare Policy**, 13, 2563.

24. Hweidi, I. M., Tawalbeh, L. I., Al-Hassan, M. A., Alayadeh, R. M., & Al-Smadi, A. M. (2017). Research use of nurses working in the critical care units: Barriers and facilitators. **Dimensions of Critical Care Nursing**, 36(4), 226-233.

25. *Ministry of Health. Amman.* Hashemite Kingdom of Jordan: Ministry of Health; 2020.

26. Abbasi, M. Farhang Dehghan, S. & Fallah Madvari, R. (2019). Interactive effect of background variables and workload parameters on the quality of life among nurses working in highly complex hospital units: A cross-sectional study. **Journal of Clinical and Diagnostic Research**. 2019 Jan, Vol-13(1): LC08-LC13.

27. Hashish, A., Aly, E., & Alsayed, S. (2020). Evidence-Based Practice and its Relationship to Quality Improvement: A Cross-Sectional Study among Egyptian Nurses. **The Open Nursing Journal**, 14(1).

28. Moe, A., & Enmarker, I. (2020). Research utilization in municipality nursing practice in rural districts in Norway: a cross-sectional quantitative questionnaire study. **BMC nursing**, 19(1), 1-10.

29. Belkhodja, O. Amara, N. Landry, R. & Ouimet, M. (2007). The extent and organizational determinants of research utilization in Canadian health services organizations. Science Communication, 28(3), 377-417.

30. Wang, L. P., Jiang, X. L., Wang, L., Wang, G. R., & Bai, Y. J. (2013). Barriers to and facilitators of research utilization: a survey of registered nurses in China. **PloS one**, 8(11), e81908.

31. Almalki, M.S. Kimpton, A. Jones, L.K. & Da Costa, C. (2022). Nurses' Perceived Facilitators of Research Utilisation in a Multicultural Setting in Saudi Arabia: Observational Study. **Nursing Reports**, 12(1), 164-174.

32. Faraji, A., Karimi, M., Azizi, S. M., Janatolmakan, M., & Khatony, A. (2019). Evaluation of clinical competence and its related factors among ICU nurses in Kermanshah-Iran: A cross-sectional study. **International journal of nursing sciences**, 6(4), 421-425.

33. Halabi, J. O., Lepp, M., & Nilsson, J. (2021). Assessing self-reported competence among registered nurses working as a culturally diverse work force in public hospitals in the Kingdom of Saudi Arabia. **Journal of Transcultural Nursing**, 32(1), 69-76.

34. Electronic Health solutions (2015). Hakeem program. Retrieved May 27, 2022 from: http://www.ehs.com.jo/en/content/hakeem-1

35. Al-Khateeb, M. (2013). Performance expectancy, effort expectancy, social influence and facilitating factors of computerized patient record use among registered nurses at Prince Hamzah hospital (Unpublished M.SC Thesis). **Jordan University of Science and Technology**, Irbid, Jordan.

36. Mirlashari, J., Qommi, R., Nariman, S., Bahrani, N., & Begjani, J. (2016). Clinical competence and its related factors of nurses in neonatal intensive care units. **Journal of caring sciences**, 5(4), 317.

37. Raddaha, A. H. A., Alasad, J., Albikawi, Z. F., Batarseh, K. S., Realat, E. A., Saleh, A. A., & Froelicher, E. S. (2012). Jordanian nurses' job satisfaction and intention to quit. **Leadership in health services**, 25(3), 216–231.

38. Rizany, I., Hariyati, R. T. S., & Handayani, H. (2018). Factors that affect the development of nurses' competencies: a systematic review. **Enfermeria clinica**, 28, 154-157.

39. Marshburn, D. M., Engelke, M. K., & Swanson, M. S. (2009). Relationships of new nurses' perceptions and measured performance-based clinical competence. **The Journal of Continuing Education in Nursing**, 40(9), 426-432.

40. Hamaideh, S. H. (2011). Burnout, social support, and job satisfaction among Jordanian mental health nurses. **Issues in mental health nursing**, 32(4), 234-242.