

Effect of Implementing Instruction Module about Competency-Based Education on Educators' Knowledge, Skills and Attitude at Faculty of Nursing -Damanhur University.

Ghada Mohammed Attia Sherif, Assistant lecturer

Nursing Education, Faculty of Nursing, Damanhur University

Azza Fathi Ibrahim, Professor

Nursing Education, Faculty of Nursing, Alexandria University

Abeer Abdel Fatah Mahmoud, Professor

Nursing Education, Faculty of Nursing, Damanhur University

Ghada El Sayed Abdelhalim, Assistant Professor

Nursing Education, Faculty of Nursing, Alexandria University

Abstract

Background: The regulation of nursing practice and the development of nursing education curricula both make extensive use of the language of competence. Implementing competency-based education (CBE) is a crucial topic of contemporary educational science generally and nursing education specifically. Nursing educators have intense needs to be trained on such valuable approach. **Aim:** to determine the effect of implementing instruction module about CBE on educators' knowledge, skills, and attitude at Faculty of Nursing -Damanhour University. **Design:** A quasi- experimental research design was used. **Setting:** the study was carried out at the Faculty of Nursing, Damanhur University. **Subjects:** 62 nurse educators who were selected conveniently and divided into control and study groups and 25 courses' specifications, and 25 courses' matrixes selected conveniently from the previously written courses specification and matrixes. **Tools:** Three tools were used. **Tool (I):** "Nurse Educators' Competency- Based Education Knowledge Questionnaire". **Tool (II):** "Nurse Educators' Competency-Based Education Attitude Rating Scale". **Tool (III):** "Nurse Educators' Competency- Based Education Planning Skills Rubric". **Results:** revealed that there was apparent improvement in the study group's scores than control group regarding CBE' knowledge, CBE' planning skills and attitude toward CBE after implementing the CBE' instruction module. Thus, there was a statistically significant difference between the study and control groups after such intervention in favor of the study group. **Conclusion:** implementing the developed CBE' instructional module among nurse educators in Faculty of Nursing, Damanhour University, Egypt, showed significant value and positive impact in improving nurse educators' CBE knowledge, planning skills and attitude toward CBE. **Recommendations:** Conducting the study in different nursing faculties in Egypt. Spreading CBE culture between nurse educators and nursing students as an effective mean for better future nursing education career theoretically and clinically.

Keywords: Instruction Module, Competency Based Education, educators' knowledge, skills, attitude, Faculty of Nursing - Damanhour University.

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Introduction

Promoting nursing educators' abilities for the 21st century practice is increasingly demanding due to the complexities of global healthcare and meeting the needs and

learning styles of the nursing students. Training and staff development for nursing educators remains a great concern that reflected on fit preparation of nurse graduates with adequate work and professional competencies (Shawish, 2017). Since 2017, in Egypt, the Ministry of Higher Education went through a massive state of

transition from traditional content- teacher centered curriculum to competency based education (CBE) which is more student-focused and actively engage students in the learning process (Brownie, et al., 2018).

Competency based education, deliberated as a performance and outcome-based educational approach that incorporates modes of instructional delivery and assessment efforts designed to evaluate mastering of learning by students through their demonstration of the knowledge, attitudes, values, skills, and behaviors required according to their abilities pace and under authentic assessment with high quality and validation (Gervais, 2016).

Currently, practicing of CBE in Egyptian faculties became a necessary for quality assurance and upgrading of nursing education future and for dealing with the intense shortage of nursing workforce. Further, nurses play an essential role in the promotion, maintenance and restoration of health which cannot tolerate 1% error (Ibrahim et al., 2021; Ahmed & Sayed, 2021). Accordingly, shifting is directed to prepare nursing graduates for standardized professional work rather than the traditional approach that focuses on rehearsing the content. CBE enhances nursing students to establish an integration of knowledge, skills, and attitudes in learning within creating authentic learning environments (Ralf et al., 2020; Muraraneza & Mtshali, 2021).

In Egypt, the National Authority for Quality Assurance and Accreditation of Education discussed and developed the National Academic Reference Standards for Bachelor Nursing Education (NARS 2017) which includes five Competence-Domains: Domain 1: Professional and Ethical Practice, Domain 2: Holistic Patient-Centered Care, Domain 3: Managing People, Work Environment, and Quality, Domain 4: Informatics and Technology, Domain 5: Inter-professional Communication (National Authority for Quality Assurance and Accreditation of Education 2017).

Nationally and internationally, the implementation of CBE has not gone

smoothly and remains challenging for nursing educators (Ralf et al., 2020). Therefore, leading agencies in higher nursing education in Egypt obligated the internal and the external nursing expertise to provide guidance for nursing educators about the CBE reform process. Such guidance was through workshops, handouts, seminars, and modules. (Brownie et al., 2018; Ibrahim et al., 2021)

One of suitable educational practices with nursing educators is the instruction module, which is one form of effective teaching strategies. It is a package in a whole within systematic educating approach, which contains a set of planned learning experiences to help learners master specific learning goals (Dechavez, 2023). It is a self-enclosed unit that emphasizes an exact learning goal or instructional focus, with specific objectives, documents, multi-media experiences, and multiple learning strategies in relation to teaching content. It has main functions to be independent, comprehensive, interactive, and credible self-instructional reference. Thus, nurse educators can learn in accordance with their respective speeds and preferences (Pulukadang et al., 2021)

Such instruction methodology will improve the learning effectiveness because nurse educators can learn anywhere in groups or alone by the module's soft materials. Moreover, they will have more motivation or enthusiasm for learning and develop the ability to interact directly, and actively with the learning environment (Suprpto et al., 2021). Likewise, through the module, nurse educators can be strictly evaluated for their achievement gradually through the criteria that are set out in the module, as well, knowing the weaknesses in competencies that have not been achieved by them. Consequently, the nurse educators can improve and build their learning/training and do remedial. Thus, such methodology can be tailored to fit CBE content to help nurse educators in learning about it and practicing it smoothly (Winita et al., 2020).

In the current study, the CBE's instruction module was designed and implemented to

represent a set of dynamic, flexible guideline for building effective CBE instruction material to be a framework for nurse educators to enable them to follow and practice CBE.

Globally, and in Egypt, there are limited studies have been conducted regarding CBE approach itself (Osman et al., (2023; Ibrahim et al., 2021; Naga et al., 2021; Ahmed & Sayed, 2021; Brownie et al., 2018), but about how to follow or implement it, there are very limited trials, particularly for academic nursing staff. It is a significant issue to fulfill academic staff needs and solve their problems or obstacles, predominantly, for applying CBE as an obligation from the Ministry of Higher Education, and coping with Egypt's Vision 2030 and its Sustainable Development Strategy, which seeks to graduate competent learners and cultivating the skills and competencies of educators. Accordingly, this study aimed to determine the effect of implementing instruction module about CBE on educators' knowledge, skills, and attitude at Faculty of Nursing -Damanhour University. It could be a valuable, unique, and worthy instructional trial to help, and support nurse educators in practicing CBE.

Aims of the Study

This study aimed to determine the effect of implementing instruction module about CBE on educators' knowledge, skills, and attitude at Faculty of Nursing -Damanhour University.

Research hypotheses

***H1:** Nurse educators who attend instruction module about CBE exhibit higher CBE knowledge mean scores than those who do not.

***H2:** Nurse educators who attend instruction module about CBE exhibit higher CBE skills mean scores than those who do not.

***H3:** Nurse educators who attend instruction module about CBE exhibit higher attitude mean scores than those who do not.

Materials and Method

Materials

Design: A quasi experimental research design was used to conduct this study.

Settings: This study was conducted at Faculty of Nursing, Damanhour University, Egypt in all its nine scientific departments.

Subjects: The subjects of this study included two samples as follow:

1-Nursing Educators: It included 62 nurse educators who selected by convenient sampling technique and fulfilled the following criteria: had a doctoral degree, shared, and contributed to writing CBE's course specifications and their matrixes and accepted to join the study. They were randomly assigned into two equal groups: study and control, 31 educator for each.

2-Documents: 25 course specifications and 25 course matrixes (for nursing courses only) were selected by convenient sampling technique from the previously written course specifications and their matrixes during the second semester, 2022-2023 from the Quality Assurance Unit at Faculty of Nursing, Damanhour University. These samples had been calculated by Epi Info 2019.

Tools: Three tools were used in this study for data collection.

Tool I: Nurse Educators' Competency-Based Education Knowledge

Questionnaire: This tool was developed by the researcher after a comprehensive review of the related literature (Ibrahim et al., 2021; Fukada, 2018; NARS 2017) to determine nurse educators' knowledge needs about CBE. It was comprised of **20** Multiple Choice Questions (MCQ). The score for each MCQ was one for the correct answer and zero for the incorrect answer. The scoring system was presented in percentages as follow: less than 60% indicated inadequate level of CBE knowledge, from 60 to 85% indicated accepted level of CBE knowledge and more than 85% indicated adequate level of CBE knowledge. **In**

addition to, nurse educators' personal and academic data sheet was attached as gender, academic position, academic department, academic years' experience, teaching load hours and previous attendance to CBE workshops or instruction and participation in CBE committee.

Tool II: Nurse Educators' Competency-Based Education Attitude Rating Scale:

This tool was developed by the researcher after a comprehensive review of the related literature (Ibrahim et al., 2021; Prokes et al., 2021; Salman et al., 2020) to assess nurse educators' attitude toward CBE at Faculty of Nursing- Damanhour University. This tool included 52 statements in a form of self-reporting scale. It consisted of four parts as the following: general attitude toward CBE, attitude toward benefits of CBE, attitude toward filling paperwork in CBE and attitude toward limitations of implementing CBE. The overall score of nursing educators' score was calculated in percentages as follows: negative attitude represented a score of less than 33.3%, neutral attitude represented a score from 33.3 to 66.7% and positive attitude represented a score above 66.7%.

Tool III: Nurse Educators' Competency-Based Education Planning Skills Rubric:

This tool was developed by the researcher after a comprehensive review of the related literature (Ibrahim et al., 2021; Salem et al., 2018; National Authority for Quality Assurance and Accreditation of Education, 2017) to determine nurse educators' CBE planning skills through assessing the quality of filling the course specifications and their matrixes according to the rules of NARS 2017 in nursing education. It included 5 dimensions as follow: filling course specification template and its items (general information, aim, content, assessment, references....), selection of domains, related competencies with related key elements (from NARS 2017), developing learning outcomes for each competency in the nursing course, filling course' matrix and mechanics, grammar quality, writing flow

and organization manner. Each dimension (planning skill) followed by description and criteria of such dimension and rated against three levels of performance which are inadequate = 1, adequate = 2, and exemplary = 3. The total score was 15 and distributed as follows: from 1 to 5 represented inadequate CBE planning skills performance, from 6 to 10 represented adequate CBE planning skills performance and from 11 to 15 represented exemplary CBE planning skills performance.

Method

Approval from the Research Ethics Committee, Faculty of Nursing, Alexandria University was obtained. An official approval to conduct this study was obtained from Dean and the Heads of the nine academic departments after providing an explanation of the aim of the study. Study tools were developed by the researcher after a thorough review of the related literature and tested for their content validity by five experts in the field of Nursing Education and Psychiatric Nursing and the necessary modifications were made. A pilot study was carried out on 6 nurse educators out of the first study sample to test tools I and II clarity and applicability and on 3 course specifications and 3 course matrixes, at the second semester 2022-2023 out of the documents sample to test tool III clarity and applicability and necessary modifications were done. Moreover, the study tools were tested for reliability using Cronbach's Alpha test. The tools were reliable, and their coefficient values were 0.850 for tool I, 0.928 for tool II and 0.844 for tool III.

Data collection phases:

The current study passed into four phases: assessment, planning, implementation, and evaluation phase.

Phase (I): Assessment phase: During this phase, the researcher obtained the educators' approval and informed consent for their participation in the study, interviewed and asked them in both groups to fill the study tools (I and II) on individualized bases. For document sample, the researcher received the needed documents from previously

written nursing course specifications (25 and 25 matrixes hard and soft copies), at the second semester 2022-2023, investigated and detected to which extent these documents matched the settled criteria according to NARS 2017 using tool III.

Phase (II): Planning phase: During this phase, the researcher, CBE's instruction module, and study subjects were prepared.

Phase (III): Implementation phase:

For the study group, was distributed into two subgroups; each subgroup was announced by the researcher about the day, time, and location of each session. The developed CBE's instruction module was implemented for two sessions over two days, each session lasted about two hours in each day with a break for half an hour.

The first session (First day) (theoretical part):

- The researcher enlightened the goals of the instruction module and intended learning outcomes of the first session to the nurse educators and explained the theoretical part of the module to the nurse educators which entailed knowledge about CBE in form of major concepts of CBE, stages and levels of competence acquisition, CBE's characteristics, comparison between CBE and traditional education and competency domains according to NARS 2017.
- The researcher provided a pause for half an hour before moving to the next part of the session and deliberated with nurse educators how to write competency learning outcomes (LOs), domains of learning objectives (Bloom taxonomies), CBE's dimensions (preparing teaching content, CBE teaching strategies, CBE's evaluation strategies "methods and tools"), common barriers and challenges for practicing CBE system and discussed with them suggestions to overcome these barriers.

The second session (Second day) (practical part):

- The researcher clarified the intended learning outcomes of the second session to

the nurse educators and began to explain the practical part of the module; the competency - based course specification (CBCS) and its components, steps of writing CBCS and its matrix, then presenting examples from written courses specifications to evaluate its writing against criteria of writing settled by NARS 2017.

- After that, the researcher gave a pause for half an hour before moving to the next part of the session. The researcher discussed with the nurse educators the most common errors in writing course specification and its matrix and provided them with examples of these errors.
- CBE's instruction module was conducted to the study group using illustrative PowerPoint, flip chart, discussion, brainstorming, mind mapping, handouts, and demonstration.
- Finally, the researcher gave empty templates of course specifications and their matrixes to the nurse educators to fill them accurately. The researcher collected the filled templates from them on individualized bases to be evaluated using tool III against the standard criteria of writing course specification.

For the control group: the control group followed CBE instructions as guided by Quality Assurance Unit without any interference from the researcher.

Phase (IV): Evaluation phase: (After module conduction)

- Both groups were asked to fill in the study tools (I & II) again and returned them back to the researcher to evaluate the effectiveness of implementing the CBE instruction module on educators' knowledge and attitude.
- The researcher collected the filled templates of course specifications and their matrixes from both groups and investigated them using tool III to evaluate the effectiveness of implementing the CBE instruction module on educators' planning skills and writing CBCS.

- Analysis and comparison the results between both groups was done before and after the intervention to evaluate the effectiveness of implementing the developed CBE's instruction module on educators' knowledge, skills, and attitude.

Ethical considerations:

Written informed consents were obtained from the nurse educators before their participation in the study after explanation the aim of the study. The educators were reassured that their participation in the study is on a voluntary basis, and they had the right to withdraw from the study at any time. The anonymity of study subjects' data was maintained by coding the educators' sheets without names. Confidentiality of collected data was ascertained.

Statistical Analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 23.0. (Armonk, NY: IBM Corp). The Shapiro-Wilk test was used to verify the normality of distribution of variables; Quantitative data were described using frequency, percentages, mean and standard deviation. The significance of the obtained results was judged at the 5% level.

Results

Table (1) shows the distribution of nurse educators among the study and control groups according to their personal and academic data. It was observed that almost all of the both groups were females (100.00%, 93.5%), respectively. Concerning the academic position, it was found that nearly two thirds of the study group (64.5%) and about one- half of control group (48.4%) were lecturers who were representative from all academic departments in the both groups.

Regarding the years of experience, about two- thirds of the both groups had more than 10 years (74.2%, 80.6%), respectively. Concerning the teaching load

hours, it was noticed that 87.1% of the both groups had teaching load more than 10 hrs./ week. About participation in CBE committees, instructions and workshops, it was discovered that about more than half of the both groups did not previously participate in any CBE committees, instructions and workshops (58.1%, 61.3%), respectively.

Generally, there were no statistically significant difference between the two groups concerning their personal and academic data where p values were (0.492, 0.479, 0.847, 0.556, 1.000, and 0.796).

Table (2) shows a comparison between the study and control groups regarding their overall knowledge about CBE before and after the intervention. Before implementation of the module, it was found that nearly most of the nurse educators in both groups (96.8% and 93.5%), had inadequate knowledge about CBE, and none of them (0.0%) had adequate knowledge about CBE. After implementing the module, about one- half (51.6%) of the study group had adequate knowledge about CBE, while no one (0.0 %) of the control group had adequate knowledge about CBE. There was apparent improvement in the overall level of knowledge about CBE for the study group after implementation of the CBE's instruction module, but for the control group there was no improvement detected.

Generally, there was statistically significant differences between both groups in relation to their overall level of knowledge about CBE after implementing the CBE' instruction module ($P < 0.001$) in favor of the study group.

Table (3) donates a comparison between the study and control groups regarding to their overall attitude toward CBE before and after implementing CBE instruction module. Before the implementation of the CBE's instruction module, it was found that 90.3% of the study group had neutral attitude toward CBE changed to be positive attitude for 71.0% of them after the module

implementation. While in control group, 74.2% of them had neutral attitude before the module changed slightly to be 93.5% in the same category (neutral) with only 6.5% of them had positive attitude after the module implementation. **Generally**, there was statistically significant difference between the both groups in relation to their overall attitude toward CBE after implementing the module ($p < 0.001$) in favor of the study group.

Table (4) shows a comparison between the study and control groups before and after the intervention according to their overall planning skills. Before the implementation of the CBE' instruction module, it was found that 84 % of the quality unit's documents had adequate level of CBE planning skills performance. While, after the intervention, it was found that 100% of documents filled by the study group had exemplary level of CBE planning skills, but in the control group, only about one third (35.5%) of them had exemplary level after conducting the module. Therefore, there was an apparent improvement in study group's level of planning skills performance than the control group after implementation of the CBE's instruction module. **Generally**, there was statistically significant difference between the both groups after implementation of the module in relation to their level of planning skills performance in favor of the study group where $p < 0.001$.

Discussion

Support and guidance with CBE curriculum design, its pedagogy, and associated assessment methodologies for nurse educators is becoming more and more necessitated (Muraraneza & Mtshali, 2021). So, nurse educators can benefit from such support in the form of workshops, projects, instructional models, or modules that could help them follow and properly integrate CBE into nursing curriculum. Therefore, this study aims to determine the effect of implementing instruction module about CBE

on educators' knowledge, skills, and attitude at Faculty of Nursing -Damanhour University.

Regarding the first hypothesis, "Nurse educators who attend instruction module about CBE exhibit higher CBE knowledge mean scores than those who do not." In the current study, there was statistically significant difference between the study and control groups in relation to their level of knowledge about CBE after implementation of the CBE's instruction module **in favor of the study group**. Therefore, the results of this study validated the effect of implementing CBE's instruction module on improving nurse educators' level of knowledge about CBE approach. Accordingly, the first hypothesis was accepted.

From the researcher's point of view, this improvement in knowledge might be due to their attendance to the instructional module sessions, and it may be the first time attending such sessions in which they received a detailed bulk of knowledge and theoretical part regarding the CBE approach. Likewise, the researcher used attractive, multiple, and innovative teaching methods in presenting the CBE's module to the educators, besides attractive interactive PowerPoint presentation with illustrated diagrams and photos, which increased educators' active engagement and interest for attending and taking advantages of the module. So, using module could increase educators' motivation or enthusiasm to learn, directs them to practice or rehearse information and gain mastery of the CBE's knowledge, through modular activities and exercises which are given after each part of the module.

This finding is in line with the study of Osman et al. (2023) who reported that there was a statistically significant difference between intern students' total CBE's knowledge scores pre, immediately, post-intervention and follow-up. Supporting this view also, Ibrahim et al. (2021), who proved that there was an improvement in the experimental group's knowledge about CBE

after the intervention and there was a statistically significant difference between both groups, after conducting the intervention. Contradicting to the previous result, Mkonongwa in 2018, discussed that there were many trails to implement educational sessions for educators about CBE, but they found many difficulties in comprehending CBE concepts and theoretical frame and educators lack knowledge about CBE.

As regards the second hypothesis, "Nurse educators who attend instruction module about CBE exhibit higher CBE skills mean scores than those who do not." In the current study, there were statistically significant differences between both groups in relation to their level of planning skills performance after implementing the module **in favor of the study group.** While the control group has not any improvement in such skills. Therefore, these results validated the effect of implementing CBE's instruction module on refining nurse educators' CBE planning skills.

The results of the present study may be due to the application of the developed CBE's instruction module, these findings revealed that nurse educators acquired basic knowledge and skills on how to implement CBE through the sessions. Since before conducting the module, the planning for CBE courses comes from the Quality Assurance Unit, has some problems in figuring out how to operationalize the competencies and their learning objectives (LOs) with limited models or benchmarking examples. Also, insufficient clear data and ambiguous terms of CBE' concepts, implementation, and its requirements, that could be unclear in course specification. Furthermore, there are some difficulties related to matching the teaching and evaluation methodologies with the course's content and nurse educators' difficulties with the learning styles of the nursing students. Therefore, the instructional module was a constructive chance for nurse educators to improve their CBE planning skills.

This finding is supported by the study of Ibrahim et al. (2021) who showed that there was a statistically significant difference between the study and control groups after implementing the intervention regarding performing the CBE planning skills in favor of the study group. Also, Ahmed & Sayed in 2021 detected that the teachers should have the basic CBE planning skills that enable them to plan suitable and feasible curricula. In contrast, Wiysahnyuy (2021) indicated that teachers faced challenges in implementing CBE, such as course planning skills, inadequate skills on how to use the approach, and limited professional development programs.

In relation to the third hypothesis, "Nurse educators who attend instruction module about CBE exhibit higher attitude mean scores than those who do not." In the current study, there was statistically significant difference between the both groups in relation to their overall attitude toward CBE after implementing the module **in favor of the study group.** Therefore, this result validated the effect of implementing the CBE' instruction module on improving and changing nurse educators' attitudes positively toward the CBE approach. Thus, the third hypothesis was achieved.

This result could be due to the improvement of their CBE knowledge and their planning skills for courses, which in turn positively affects their attitude. This finding is important since a positive attitude would improve nurse educators' engagement in the current and future practice of the CBE approach and following such a system. Thus, the study approved that the guidance and educational sessions to the educators can change their attitudes and perceptions positively.

These findings are in congruence with Osman et al. (2023) and Ibrahim et al. (2021), who reported that there were highly statistically significant differences between total attitude scores pre and post implementing CBE's intervention. Furthermore, Khan et al. (2022) concluded in their study that professional training

development programs on CBE and assessment positively influenced the behavior, attitude, motivation, roles, and responsibilities of educators. Opposing to these findings, Ngeno et al. (2021) and Bingham et al. (2021) concluded that many educators had negative attitude toward CBE because most of the work was incomplete due to insufficient time, its vague aspects and the difficulty of its operations, so they were still inflexible on CBE implementation because they felt it was massive and so demanding on learners.

Conclusion

The results of the current study concluded that the developed CBE's instruction module among nurse educators in Faculty of Nursing, Damanhour University, Egypt, showed beneficial effect, significant value, and positive impact in improving their CBE knowledge, planning skills and attitude toward CBE. CBE's knowledge was recognized, understood, and improved after the intervention among the study group. Furthermore, nurse educators were prepared and equipped to plan and implement the CBE approach effectively that was clearly revealed in their CBE's planning skills performance scores. Consequently, their attitude toward CBE positively changed and improved by such sessions. So, it could be valuable, unique and worthy instructional trial to guide, direct and support nurse educators in practicing and implementing CBE approach.

Recommendations

Based on the findings of the present study, the following recommendations are offered:

Recommendations for nurse educators

- Provide periodic professional training to nurse educators to improve their competency in implementing CBE at Faculty of Nursing.
- Guarantee adequate instructional learning resources; human and nonhuman

resources such as adequate staff to student ratio, financial support, infrastructures, and equipment that could serve CBE implementation.

- Develop CBE's committee from faculty leaders, heads of academic department and quality assurance majors to regularly supervise educators' performance and offer guidance on modification where necessary.
- Provide continuous orientation and guidance for nursing students about CBE to improve their knowledge, attitudes, and practices regarding CBE, therefore, this could help educators in easy application of such approach.

Recommendations for Further studies

- Conduct the study in different nursing faculties in Egypt to generalize the results of the study and raise the competence of nurse educators in CBE implementation.
- Development of electronic module about CBE for nurse educators.
- Assessment of CBE implementation progress in most of nursing faculties in Egypt.
- Evaluate the effectiveness of CBE on nursing students' achievement, engagement, and patients' satisfaction.
- Development of valid and reliable competency assessment tools for effective nursing student performance and evaluation.

Table (1): Distribution of the study and control groups according to their personal and academic data as presented by number and percentages (N=62)

Personal and academic data	Study (n = 31)		Control (n = 31)		χ^2	MCp
	No.	%	No.	%		
Sex						
Female	31	100.0	29	93.5	2.067	0.492
Male	0	0.0	2	6.5		
Academic position:					2.753	0.479
Lecturer	20	64.5	15	48.4		
Assistant professor	7	22.6	9	29.0		
Professor	4	12.9	5	16.1		
Assistant professor emeritus	0	0.0	0	0.0		
Professor emeritus	0	0.0	2	6.5		
Academic department					4.623	0.847
Medical & Surgical Nursing	5	16.1	2	6.5		
Critical Care &Emergency Nursing	2	6.5	3	9.7		
Pediatric Nursing	4	12.9	2	6.5		
Obstetric and Gynecological Nursing	5	16.1	4	12.8		
Psychiatric and Mental Health Nursing	2	6.5	2	6.5		
Community Health Nursing	3	9.7	6	19.3		
Gerontological Nursing	4	12.9	3	9.7		
Nursing Administration	3	9.7	6	19.3		
Nursing Education	3	9.7	3	9.7		
Years of experience in academic work					1.428	0.556
5 - 10 years	8	25.8	6	19.4		
>10 years	23	74.2	25	80.6		
Teaching load					0.0	1.000
Less than 10 hrs/week	4	12.9	4	12.9		
More than 10 hrs/week	27	87.1	27	87.1		
Previous participation in CBE committees, instructions, workshops					0.067	0.796
Yes	13	41.9	12	38.7		
No	18	58.1	19	61.3		

χ^2 : Chi square test for comparing between the two groups.

MCp: p value for Monte Carlo significance for comparing between the two groups.

*: Statistically significant at $p \leq 0.05$

Table (2): Comparison between the study and control groups' overall knowledge about CBE before and after the intervention as presented by number, percentage and mean scores (N=62)

Overall nurse educators' knowledge about CBE	Study (n = 31)				Control (n = 31)				Study vs Control	
	Pre		Post		Pre		Post		Pre	Post
	No.	%	No.	%	No.	%	No.	%		
Inadequate CBE knowledge	30	96.8	6	19.4	29	93.5	30	96.8	$\chi^2 = 0.350$, P = 1.000	$\chi^2 = 38.40^*$, P<0.001*
Accepted CBE knowledge.	1	3.2	9	29.0	2	6.5	1	3.2		
Adequate CBE knowledge	0	0.0	16	51.6	0	0.0	0	0.0		
Mean percent score	41.89±14.9		78.1±17.2		40.7±14.1		37.1±12.8		$t_1 = 0.327$, p = 0.774	$t_1 = 10.369^*$, p<0.001*
t₂(p)	8.816*(<0.001*)				0.954 (0.348)					

χ^2 : Chi square test for comparing the two groups

t_1 : Student t-test for comparing the two groups

t_2 : Paired t test for comparing between pre and post in each group

* Statistically significant p-value at ≤ 0.05

Table (3): Comparison between the study and control groups according to their overall attitude toward CBE before and after the intervention as presented by number, percentage and mean percent scores (N=62)

Overall nurse educators' CBE attitude	Study (n = 31)				Control (n = 31)				Study vs Control	
	Pre		Post		Pre		Post		Pre	Post
	No.	%	No.	%	No.	%	No.	%		
Negative	0	0.0	0	0.0	0	0.0	0	0.0	$\chi^2 = 2.763$, p = 1.82	$\chi^2 = 27.19^*$, P < 0.001*
Neutral	28	90.3	9	29.0	23	74.2	29	93.5		
Positive	3	9.7	22	71.0	8	25.8	2	6.5		
Mean percent score	57.0±7.7		73.4±14.4		57.1±11.4		57.0±7.5		t ₁ = 0.056, p = 0.955	t ₁ = 5.657*, p < 0.001*
t₂(p)	5.867* (<0.001*)				0.097 (0.923)					

χ^2 : Chi square test for comparing the two groups t₁: Student t-test for comparing the two groups

t₂: Paired t test for comparing between pre and post in each group

* Statistically significant p-value at ≤0.05

Table (4): A comparison between the study and control groups before and after the intervention according to their overall planning skills as presented by number, percentage and mean percent scores

Overall nurse educators' CBE planning skills	Pre (Quality documents) (n = 25)		Post study (Filled by educators) (n = 31)		Post control (Filled by educators) (n = 31)	
	No.	%	No.	%	No.	%
Inadequate CBE planning skills performance	0	0.0	0	0.0	0	0.0
Adequate CBE planning skills performance	21	84.0	0	0.0	20	64.5
Exemplary CBE planning skills performance	4	16.0	31	100.0	11	35.5
Mean percent score	53.9±7.9		81.08±0.45		56.77±8.92	
F (p)	91.824*(<0.001*)					

F: F for ANOVA test

* Statistically significant p-value at ≤0.05

References:

Ahmed, A., & Sayed, K. (2021). An extensive model for implementing competency-based training in technical and vocational education and training teacher training system for Assiut-Integrated Technical Education Cluster, Egypt. *The Journal of Competency-Based Education*, 6 (2), 1-11. <https://doi.org/10.1002/cbe2.1245>.

Bingham, A. J., Adams, M., & Stewart, R. L (2021). Competency-based education: Examining educators' experiences. *The Qualitative Report*, 26(3), 674-695. <https://doi.org/10.46743/2160-3715/2021.4383>.

Brownie, S. M., Docherty, C., Al-Yateem, N., Gadallah, M. H., & Rossiter, R. (2018). Developing a national competency-based curriculum for technical nurses in Egypt. *Eastern Mediterranean health journal*, 24(09), 922-932. [DOI:10.26719/2018.24.9.922](https://doi.org/10.26719/2018.24.9.922).

Dechavez, M. D. (2023). Peer and students' evaluation: An instructional module enhancement. *International Journal of research and innovation in social science (IJRISS)*, 7(1). [DOI: 10.47772/IJRISS](https://doi.org/10.47772/IJRISS).

Gervais, J. (2016). The operational definition of competency-based education. *Journal of Competency-based Education*, 1, 98-106. <http://dx.doi.org/10.1002/cbe2.1011>.

- Ibrahim, A. F., Gaber, M. A., & Morsy, S. R. (2021). The effect of instructional intervention about competency-based nursing education on academic's knowledge, planning skills, and their acceptance during COVID Pandemic. *Egyptian Journal of Health Care*, 12 (4), 123-149.
- Khan, S., Ahmed, R. R., Streimikiene, D., Streimikis, J., & Jatoi, M. A. (2022). The competency-based training & assessment, and improvement of technical competencies and changes in pedagogical behavior. *Economics and Management*, 25(1), 96–112. <https://doi.org/10.15240/tul/001/2022-1-006>.
- Mkonongwa, L., M. (2018). Competency-based teaching and learning approach towards quality education. *Dar es Salaam University College of Education*, 21(7), 1–12.
- Muraraneza, C., & Mtshali, G. M. (2021). Planning reform to competency based curricula in undergraduate nursing and midwifery education: A qualitative study. *Nurse Education Today*, 106. <https://doi.org/10.1016/j.nedt.2021.105066>.
- Naga, M., Bedier, N., Salem, M., Ahmed, H., & Elhfnawy, A. (2021). Effect of competency based program on nurses' knowledge, skills and attitude toward the care of patients with stroke. *Alexandria Scientific Nursing Journal(ASNJ)*, 23 (2), 10-21. <https://doi.org/10.21608/asalexu.2021.219098>
- National Authority for Quality Assurance and Accreditation of Education. (2017). National Academic Reference Standards (NARS) Nursing Education, 2nd edition. Egypt. Available at: <http://naqaae.eg/wpcontent/uploads/2014/10/nursing.pdf>. Retrieved in July 2023.
- Ngeno, B. Mwoma, T. & Mweru, M. (2021). Teachers' attitude in implementation of competence –based curriculum in primary schools in Kericho County. *East African Journal of Education Studies*, 3 (1), 116-128.
- Osman, N. E, El-Ansary, E., & Mohamady, Sh.H. (2023). Effect of competency-based education on interns nursing students' performance regarding active management of third stage of labor. *International Egyptian Journal of Nursing Sciences and Research (IEJNSR)*, 3 (2), 342-362.
- Pulukadang, W. T., Malabar, S., Husain, AK., & Pana, H. (2021). Development of integrated learning module on the development of learning devices. *International Journal of Advanced Engineering, Management and Science (IJAEMS)*, 7 (4),15-22.
- Ralf, A.L., Griethuijsen, V., Kunst, E. M., Woerkom, M. V., Wesselink, R., & Poell, R. F. (2020). Does implementation of competence-based education mediate the impact of team learning on student satisfaction?. *Journal of Vocational Education & Training*, 72(4), 516-535. <https://doi.org/10.1080/13636820.2019.1644364>.
- Shawish, N. (2017). Competency based education on midwifery students' knowledge and skills of immediate neonatal care and basic resuscitation [Doctoral Thesis]. Faculty of Nursing. Alexandria University, 9-55.
- Suprpto, K. A., Serevina, V.,& Marpaung, M. A. (2021).The development of electronic module based on problem based learning on balance and rotation dynamic topic to improve science literacy of senior high school students. *AIP Conference Proceedings*, 2320, 1-8. <https://doi.org/10.1063/5.0038343>.
- Winita, S., Ramadhan, S., & Asri,Y. (2020). The development of electronic module based on discovery learning in writing explanation text. *Advances in Social Science, Education and Humanities Research*, 463, 63-69.
- Wiyahnyuy, L. F., (2021).The competency based approach in Cameroon Public Secondary Schools: Modes of appropriation and constrains. *International Journal of Humanities Social Sciences and Education (IJHSSE)*, 1 (8), 92-103.