

The Relation between Systems Thinking and Safe Nursing Care among Nurses at Menoufia University Hospital

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Abstract: BBackground: Systems thinking plays an important role in any health care institution as they shape and affect the nature of nurses' knowledge, behaviors, skills and attitudes that contribute to deliver safe nursing care within the rapidly altering work environment. **Purpose:** To determine the relation between systems thinking and safe nursing care among studied nurses at Menoufia University Hospital. **Design:** A correlational research design was used. **Setting:** The study was conducted in the critical care units of Menoufia University Hospital. **Sampling:** A simple random sampling of 250 nurses constitutes the study sample. **Two instruments** were used they were named Systems Thinking Scale and Assessment of Safe Nursing care questionnaire. **Results:** Less than two thirds of studied nurses (61.2%) had high level of systems thinking and more than two thirds of them (70.4%) had high level of safe nursing care while, the minority of them had low level of both systems thinking and safe nursing care. **Conclusion:** There was a highly statistically significant positive strong correlation between systems thinking and safe nursing care among studied nurses. **Recommendations:** Training programs should be conducted for nurses to enhance nurses' knowledge and skills related to systems thinking and safe nursing care. Further study about barriers affecting systems thinking and safe nursing care in different health care sectors. Perform collaboration protocol between the college of nursing and hospital to improve systems thinking and safe nursing care.

Keywords: Nurses- Safe nursing care-Systems thinking,

Introduction

Nowadays, the world of health care is complex and growing more complex every day. Managers must contend with technological innovation along with an ever-growing global economy in which events on one end of the

globe will affect your organization. Making effective decisions is much more difficult in this brave new world, and systems thinking provides a model of decision-making that helps organizations effectively deal with

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change and adapt (Notarnicola et al., 2019).

Systems thinking (ST) is a paradigm and revolutionary instrument for “creativity and learning” and for “solving/dissolving” problems in complex social systems. It is considered a foundational requirement for transformational leadership and for maximizing system effectiveness. The systems thinking approach contrasts with traditional analysis, which studies systems by breaking them down into their separate elements. Systems thinking can be used in any area of research and has been applied to the study of medical, environmental, political, economic, human resources, and educational systems, among many others (Lutkevich, 2022).

System thinking is a method of critical thinking by which the relationships between the system's parts can be analyzed in order to understand a situation for better decision-making. Moreover, systems thinking has various uses in healthcare. It helps explore problems within the whole system, leading to solutions that are compatible with the other healthcare components. It also ensures that people collaborate effectively and learn from one another. It also aids in research and planning (Smith et al., 2022).

Systems thinking in organizations means that we view organizations as interconnected pieces or subsystems. It is no longer a set of boxes, but a web of interconnected parts. Since an organization is an interconnected web, a change to one area of the organization can have ripple effects in many other parts of the organization (Gibb, 2022).

Moreover, systems thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions as: Clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness (Anthony, 2023).

Nurses play a crucial role in preserving safe nursing care, considering that they constitute the largest portion of healthcare providers. They also play an active role in detecting and preventing errors. Furthermore, the holistic merit of nursing practice demands direct interaction and intervention with patients. This complex and intense nature of nursing practice make nurses prone to committing unintentional errors, and as a result of time constraint and insufficient manpower and resources, they often have to consciously prioritize some activities over others (WHO, 2020).

Nursing care has a significant impact on patient safety, which affects clinical outcomes, patients' satisfaction with the care received and nursing personnel's satisfaction with the care provided (Witczak et al., 2021).

Safe nursing care in healthcare has received substantial attention worldwide since the late recent years, the issues of safe nursing care have become important topics in health policy and health care practice in several countries. Rapid change in

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health care has mandated greater attention to safety of care, which is essential to efficient, competent delivery of quality care. World health care organization safety is a condition or state of resulting from the modification of human behavior and /or designing of the physical environment to reduce hazard, thereby reducing the chance of accident (WHO, 2020).

Additionally, safety of nursing care is a health issue of global interest, and nurses should be competent in their ability to provide care services based on relevant nursing standards. Nursing competency consists of core abilities required for performing one's role as a nurse and patient safe care refers to the knowledge, attitudes and skills that nurses should possess to prevent patients from the injuries or errors (Fukada, 2018).

Moreover, the safe care includes skill and knowledge statements categorized into nine domains (nine core competencies): Therapeutic communication; person-centered care; teamwork and collaborative practice; preventing; minimizing and responding to adverse events; cultural competency; infection prevention and control; medication safety; evidence-based practice and clinical reasoning. Establishing a positive patient safety culture among clinical and administrative staff is essential for the improvement of safety quality. The continuous quality improvement is the adoption of reliable data and improvement methods to learn which interventions, in which context, can comprehensively optimize care

processes in healthcare systems (Gallen et al., 2019).

Likewise, safe nursing care has emerged from the health care quality movement that is equally abstract, with various approaches to the more concrete essential components. Safe nursing care is discipline in health care sector that applies safety science methods toward the goal of achieving a trustworthy system of health care delivery. Safe care is also an attribute of health care systems; it minimizes the incidence, impact of maximize recovery form and adverse events. Establishing a positive safety of nursing care culture among clinical and administrative staff is essential for the improvement of safety and quality (WHO, 2021).

Additionally, on the brink of adopting a new systems-based practice competency for which nurses need to have basic knowledge about the healthcare system to create optimum health benefits for patients/families and organizations. Systems thinking competencies reinforce nurses' roles in safety and quality improvement. Nurses employing systems thinking and systems-based practice able to understand interrelationships among nursing, the nursing work unit, and organizational goals. They're encouraged to solve problems encountered at the point of care and appreciate their roles in identifying work unit inefficiencies and operational failures. Nurses must be able to take action to address potential or ongoing quality and safety concerns. They need to be active participants in monitoring, admitting to, reporting, investigating, resolving near misses,

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errors, and systems breakdowns involving communication, supplies, medication, equipment, finances, and technology (Staleter et al., 2018).

Systems thinking of hospital nurses play a pivotal role as predictors in safe nursing care and competency. Training opportunities, mentorship and nursing managers' leadership are needed to assist hospital nurses in their perceptions of systems thinking. Nursing educators and managers should implement safe nursing care training strategies and improve the systems thinking of hospital nurses to promote safe and quality of nursing care. Systems thinking, safety and competency are aspects of quality of care in health care organizations that appear to relate to and influence each other (Ghafari et al., 2021).

SIGNIFICANCE OF THE STUDY

Today, the organizations that want to achieve their organizational goals deal with the human factor, which fundamental factor of organizations. Nurses' performance is a critical factor in success of health care organization (Gunapalan & Ekanayake, 2019).

As the health care system is specialized and complex and involves increasing amounts of advanced technologies, the importance of safe nursing care and quality of care is becoming more prominent. The World Health Organization, (2020) reported that 42.7 million medical errors occur each year during hospitalizations, highlighting that medical errors are the 14th leading cause of death and morbidity worldwide (Mahsoon and Dolansky, 2021).

However, improving nursing care is a challenging issue in health care worldwide. All health care personnel, including nurses, should have optimal safe nursing care, competency to ensure the quality of care as nurses are responsible for 24-h patient care (Ghafari et al., 2021).

Systems thinking, and safe nursing care are the key elements in quality improvement and compliance with care, practice, regulatory and accreditation standards in health care. They are associated with organizational context (Moazez et al., 2020). Nursing managers need to focus on the systems thinking weaknesses, the occurrence and the reporting of adverse events in policymaking. Systems thinking should be integrated with the health care system for preventing the occurrence of adverse events and improving reporting of adverse events (Kakemam et al., 2022). Therefore, the current study was conducted to determine the relation between the systems thinking and safe nursing care among studied nurses at Menoufia University Hospital.

PURPOSE OF THE STUDY

The purpose of this study is to determine the relation between systems thinking and safe nursing care among studied nurses at Menoufia University Hospital.

RESEARCH QUESTIONS:

- 1) What is the level of the systems thinking among studied nurses?
- 2) What is the level of safe nursing care among studied nurses?

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- 3) What is the relation between systems thinking and safe nursing care among studied nurses at Menoufia University Hospital?

METHODS

This study was conducted to determine the relation between systems thinking and safe nursing care among studied nurses at Menoufia University Hospital.

Study design

A correlational research design was used in the conduction of this study.

Study Setting:

The study was conducted at critical care units of Menoufia University Hospital which is affiliated to University sector. It was established in 1993, it is considered one of the largest hospitals in Delta region of Egypt. The bed capacity of the hospital is 1070 beds. This hospital contains four buildings (general hospital, emergency hospital, specialized hospital, and oncology institution). The estimated number of nursing workforce in the hospital was 1300 nurses with different educational levels in nursing. The four buildings provide primary and secondary health care to different populations. This hospital provides comprehensive medical and surgical services for patients, teaching services for medical and nursing students in addition to research activities. Three of these buildings are interlinked, and one separate building namely oncology institution.

Sampling:

A simple random sample technique was used to achieve the study purpose. A list of critical units' nurses working in Menoufia university Hospital was prepared. Each studied nurse marked with a specific number (from 1 to 600). A bowl method, was used. These pieces were folded in the same way and mixed in the container. Finally, samples were taken randomly from the box by randomly selecting folded pieces of paper with replacement so each studied nurse had an equal chance of reaching the desired sample size (250 nurses).

Instruments:

Data was collected using two different instruments.

Personal characteristics it include self reported information was designed including age, sex, marital status, educational level and years of experience.

Instrument One: Systems Thinking Scale (STS)

The systems thinking scale was adopted from Moore et al., (2010). Contained 20 items which were used to assess nurses' ability to recognize, understand and synthesize the sequence of events, causal sequences, possible multiple causes, different types of events, feedback and interrelated factors.

Scoring systems

The studied nurses' responses were assessed by using 5-points Likert scale 0=Never, 1=Seldom, 2= Sometimes,

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3=Often, and 4=Most of the time. Total scores were computed by summing up the responses for each item. Scores ranged from 0 to 80. In addition, the higher the score, the higher the level of systems thinking. Scores less than 60% (0-47), means low level, scores equal or more than 60%, to less than 75% (48-59), means moderate level and scores more than or equal 75% (60-80), means high level (Moore et al., 2010).

Instrument Two: Assessment of Safe Nursing Care questionnaire

Assessment of safe nursing care questionnaire was adopted from Rashvand et al., (2017). It was used to assess nurses' practices in preventing harm to patients and maximizing early detection of errors. The ASNC includes 34 items divided into four dimensions. First dimension is nursing skills (15 items), it shows the standard care routines, nurses' practice, and reporting patient's safety incidents. Second dimension is patient's psychological needs (7items). It shows how much a nurse cares about the issues, such as the patients' disease information, patients' privacy, attendance at the patients' bedside, no disclosure of the patients' personal information, the questions and complaints, permissions to visit, patients' preferences and introduction of the treatment team members to the patient.

Third dimension is for assessing the patient's physical needs (7items). It shows how much a nurse cares about the physiological needs of patients, such as nutrition, excretion, pain, and

sleep. Fourth dimension is for assessing nurses' teamwork (5items). It includes nurses' teamwork activities, participation, and effective communication with other members of the health care team.

Scoring systems

The ASNC is scored using a 5-point Likert scale, ranging from 1 to 5, 1 (never) to 5 (always). The score of each dimension was computed by summing the points of each item. Afterwards, the score was divided by the number of items. Therefore, the total score ranges from 34 to 170. The higher the score, the better the safe nursing care. Score less than 60% (34-101), means low level of nursing care, score equal and more than 60% to less than 75% (102-127), means moderate level while, score more than or equal 75% (128-170), means high level (Rashvand et al., 2017).

Validity and reliability of instruments:

Validity:-

The instruments translated into Arabic language to be clear for all nurses' education levels and reviewed by a panel of five experts, one professor and two assistant professors in nursing administration department from Menoufia University & two assistant professors in nursing administration department from Benha University to assess the face and content validity. Face and content validity of the instruments aimed to judge its clarity, relevance, and accuracy. The panel examined instruments' relevance to the purpose of the study, and grammar. Minor modifications and rephrasing in

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Arabic translation of some items were done based on the jury's opinions. The instruments were considered valid from the experts' perspective.

Reliability:-

The study instruments were examined for reliability by measuring the internal consistency of items using Cronbach's alpha coefficient test.

Cronbach's alpha of systems thinking scale was equal 0.74. Cronbach's alpha of safe nursing care was equal 0.90. These values indicated that the instruments were highly reliable.

Ethical Consideration

Approval of the Ethical and Research Committee, Faculty of Nursing was obtained number 900 Date was 23-10-2022. The respondents' rights were protected by ensuring voluntary participation; so that a written informed consent was obtained after explaining the purpose, nature, time of conducting the study, benefits of the study and how data would be collected. The respondents were assured that the data was treated as strictly confidential; furthermore, the respondent's anonymity was maintained as they weren't required to mention their names.

Pilot study:

After reviewing the instruments by the experts, the investigator conducted a pilot study before administering the questionnaires. The purpose of the pilot study was to ascertain the clarity, relevance, feasibility, and applicability of the study instruments and to determine obstacles that may be

encountered during data collection. It also helped to estimate the time needed to fill the questionnaire. The pilot study carried on 10% of sample size (25) nurses. No modification was done so the sample of the pilot study were included in the study. The time required to fill each of the two questionnaires was estimated to be 25-30 minutes.

Statistical analysis

Data entry and analysis were performed using SPSS (Statistical package for Social Studies) statistical package version 25. Categorical variables were expressed as number and percentage while continuous variables were expressed as mean \pm SD. Chi-Square (χ^2) was used to test the association between row and column variable of qualitative data.

ANOVA test (F) was used to compare mean in normally distributed quantitative variables for more than two groups. Pearson correlation was done to assess the correlation between quantitative variables.

For all tests, a two-tailed p-value \leq 0.05 was considered statistically significant, P-value \leq 0.01 was considered highly statistically significant. While p-value $>$ 0.05 was considered not significant.

RESULTS

Table (1): Shows frequency distribution of studied nurses according to personal data. As evident from the table, more than half (56%) of the studied nurses were females. In relation to marital status, more than two thirds (68.8%) of them were

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married. Considering age, about three quarters (74%) of them ranged from 20- ≤ 30 years old. Regarding years of experience, less than two thirds (64.4%) of the studied nurses were between 1- ≤ 5 years of experiences. Concerning educational level, less than two thirds (63.6%) of them have bachelor's degree in nursing.

Figure (1): Describes frequency distribution of studied nurses according to their working area. As evident from the figure, almost one quarter (24.8%, 22.4%) of studied nurses were working in CCU units and surgical ICU units, respectively. While, the minority (16.4%) of them work in ICU.

Table (2): Represents frequency distribution of studied nurses according to the level of systems thinking. As evident from the table, the majority (93.2%, 89.6%, 86.4%) of the studied nurses determine cause of the problem, think small changes can produce important results, think more than one nurse are needed to have success respectively. Moreover, half of them (50) thinking importance of recurring patterns. Considering the total level of systems thinking, it clarifies that less than two thirds (61.2%) of the studied nurses had high level of systems thinking, while, only (3.6%) of them had low level of systems thinking. In addition to, presence of a highly statistically significant difference among low, moderate, and high level, at $P = 0.000$.

Table (3): Represents mean score of total systems thinking among the studied nurses. As noted from the table, the highest percentage (61.2%) of studied nurses had high level of system thinking. While, only (3.6%)

had low level of system thinking. Moreover, the total mean of system thinking was 61.15 ± 7.04 . In addition, there was a highly statistically significant difference among low, moderate, and high level, at $P = 0.000$.

Figure (2): Illustrates percentage distribution of level of total systems thinking among the studied nurses. As noted from the figure, less than two thirds (61.2%) of the studied nurses had a high level of total systems thinking. While, only (3.6%) had low level of total system thinking. Additionally, presence of a highly statistically significant difference among low, moderate, and high level, at $P = 0.000$.

Table (4): Displays mean score of total safe nursing care among the studied nurses. As evident from the table, more than three quarters (78.4%) of the nurses' teamwork has a higher percentage in terms of high level. While, more than half (55.2%) of nurses' evaluation of nursing skills received a lower score. Regarding total level of safe nursing care, more than two thirds (70.4%) of them had high level of safe nursing care. Additionally, there was a highly statistically significant difference at $P = 0.000$.

Figure (3): Illustrates percentage distribution of level of total safe nursing care among the studied nurses. As noted from the figure, more than two thirds (70.4%) of the studied nurses had a high level of total safe nursing care. While, only (2%) of them had low level of safe nursing care. Additionally, presence of a highly statistically significant difference

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among low, moderate, and high level, at P = 0.000.

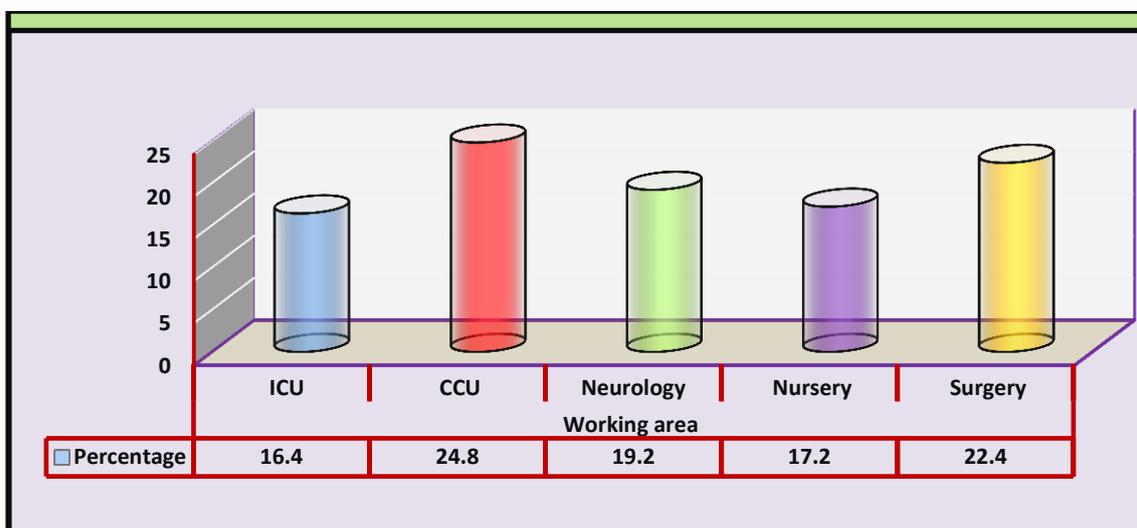
Table (5): Illustrates correlation between total score of systems thinking and safe nursing care among the studied nurses. As shown from the table, there was a highly statistically significant positive strong correlation

between systems thinking and all safe nursing care dimensions (evaluation of nursing skills, patient's psychological needs, patient's physical needs and nurses' teamwork) among the studied nurses, at r ranged from 0.947 to 0.970 and P = 0.000.

Table (1): Frequency distribution of studied nurses according to their personal data (n= 250).

	Items	N.	%
Sex	▪ Male	110	44.0
	▪ Female	140	56.0
	▪ Male to Female ratio	0.8:1	
Marital status	▪ Married	172	68.8
	▪ Unmarried	78	31.2
Age in year	▪ 20- ≤ 30 years old	185	74.0
	▪ 31- ≤ 40 years old	57	22.8
	▪ 41- ≤ 50 years old	4	1.6
	▪ > 50 years old	4	1.6
	▪ Mean ± SD	28.68 ± 5.87	
Years of experience	▪ 1- ≤ 5 years old	161	64.4
	▪ 6- ≤ 10 years old	57	22.8
	▪ 11- ≤ 15 years old	12	4.8
	▪ > 15 years old	20	8.0
	▪ Mean ± SD	6.62 ± 4.74	
Educational level	▪ Secondary school diploma	19	7.6
	▪ Associated degree in nursing	25	10.0
	▪ Bachelor's degree in nursing	159	63.6
	▪ Post-graduate studies	47	18.8

Figure (1): Frequency distribution the studied nurses according to their working area (n=250).



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Table (2): Frequency distribution of studied nurses according to their level of systems thinking (n= 250).

Systems thinking	Low		Moderate		High		χ^2	P value
	N	%	N	%	N	%		
• Seek everyone’s view of situation.	10	4.0	88	35.2	152	60.8	121	0.000**
• Determine cause of the problem.	4	1.6	13	5.2	233	93.2	403	0.000**
• Understanding the chain of events	18	7.2	51	20.4	181	72.4	178	0.000**
• Including nurses in my work unit	4	1.6	47	18.8	199	79.6	251	0.000**
• Thinking importance of recurring patterns.	37	14.8	88	35.2	125	50.0	46.8	0.000**
• Thinking of the problem at hand as a series of connected issues	14	5.6	50	20.0	186	74.4	197	0.000**
• Consider problem cause & effect.	5	2.0	45	18.0	200	80.0	254	0.000**
• Consider the relationships among coworkers in the work unit.	0	0.0	80	32.0	170	68.0	32.4	0.000**
• Thinking systems are changing.	43	17.2	38	15.2	169	67.6	132	0.000**
• Propose solutions affect work.	21	8.4	18	7.2	211	84.4	293	0.000**
• Propose changes affect all system	4	1.6	35	14.0	211	84.4	299	0.000**
• Think more than one nurse are needed to have success.	0	0.0	34	13.6	216	86.4	132	0.000**
• Keep the mission and purpose of the organization in mind.	17	6.8	21	8.4	212	84.8	298	0.000**
• Think small changes can produce important results.	0	0.0	26	10.4	224	89.6	156	0.000**
• Consider how multiple changes affect each other.	5	2.0	66	26.4	179	71.6	187	0.000**
• Think how different nurses might be affected by the improvement.	12	4.8	36	14.4	202	80.8	256	0.000**
• Try strategies that do not rely on people’s memory.	16	6.4	78	31.2	156	62.4	118	0.000**
• Recognize system problems are influenced by past events.	12	4.8	70	28.0	168	67.2	149	0.000**
• Consider work history & culture	21	8.4	36	14.4	193	77.2	217	0.000**
• Consider that the same action can have different effects over time.	12	4.8	54	21.6	184	73.6	192	0.000**
Total	9	3.6	88	35.2	153	61.2	124	0.000**

*Significant $p \leq 0.05$

**Highly significant $p \leq 0.01$

Table (3): Mean score of total systems thinking among the studied nurses (n=250).

Systems thinking levels	N	%	$\bar{x} \pm SD$	F test	P value
Low	9	3.6	39.0 \pm 0.00		
Moderate	88	35.2	55.37 \pm 3.57		
High	153	61.2	65.25 \pm 4.83		
Total	250	100.0	61.15 \pm 7.04	199.7	0.000**

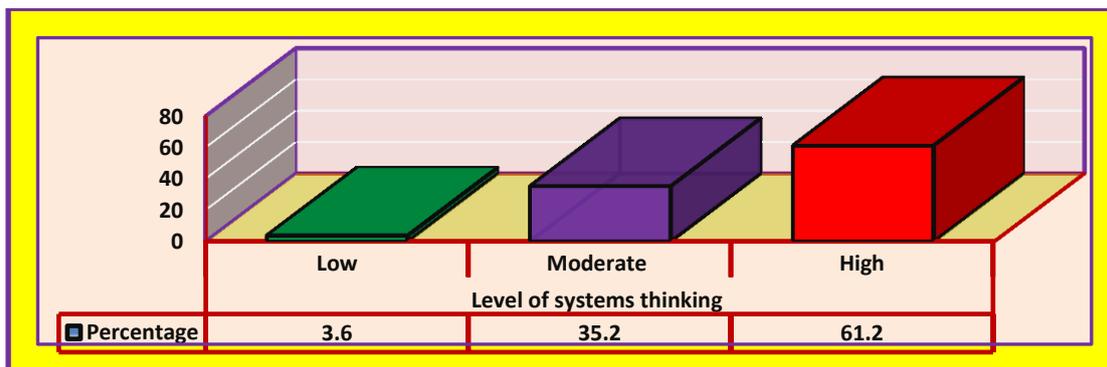
*Significant $p < 0.05$

ANOVA T test

**Highly significant $p < 0.01$

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Figure (2): Percentage distribution of studied nurses according to their Level of total systems thinking (n= 250).



$\chi^2=124, P=0.000^{**}$

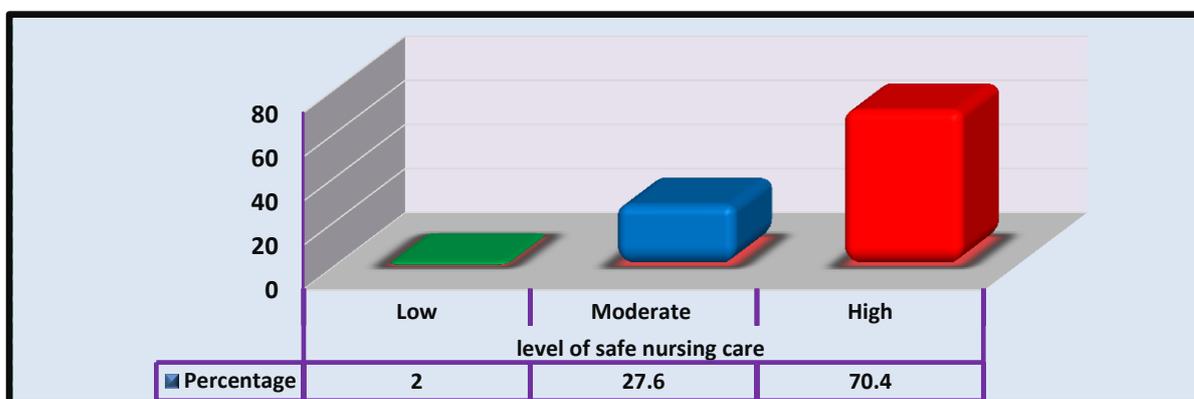
Table (4): Mean score of total safe nursing care among the studied nurses (n= 250).

Variable		N	%	Min	Max	$\bar{x} \pm SD$	F test	P value
Evaluation of nursing skills	Low	10	4.0	29	38	35.0 \pm 4.0	549	0.000 ^{**}
	Moderate	102	40.8	45	56	50.6 \pm 3.6		
	High	138	55.2	57	72	62.4 \pm 3.1		
	Total	250	100.0	29	72	56.5 \pm 7.9		
Patient's psychological needs	Low	9	3.6	20	20	20.0 \pm 0.00	214	0.000 ^{**}
	Moderate	58	23.2	21	26	24.84 \pm 1.4		
	High	183	73.2	27	35	30.50 \pm 2.4		
	Total	250	100.0	20	35	28.81 \pm 3.6		
Patient's physical needs	Low	4	1.6	17	20	17.75 \pm 1.5	262	0.000 ^{**}
	Moderate	74	29.6	23	26	25.08 \pm 1.24		
	High	172	68.8	27	35	31.59 \pm 2.62		
	Total	250	100.0	17	35	29.44 \pm 4.03		
Nurses' teamwork	Low	7	2.8	13	14	13.43 \pm 0.535	169	0.000 ^{**}
	Moderate	47	18.8	17	18	17.64 \pm 0.486		
	High	196	78.4	19	25	21.71 \pm 1.92		
	Total	250	100.0	13	25	20.71 \pm 2.64		
Total	Low	5	2.0	80	99	89.0 \pm 9.2	403	0.000 ^{**}
	Moderate	69	27.6	112	125	118.8 \pm 3.50		
	High	176	70.4	130	163	143.3 \pm 8.03		
	Total	250	100.0	80	163	135.4 \pm 14.6		

*Significant $p < 0.05$ ANOVA test

**Highly significant $p < 0.01$

Figure (3): Percentage distribution of level of total safe nursing care among the studied nurses (n= 250).



$\chi^2=124, P=0.000^{**}$

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Table (5): Correlation between total score of systems thinking and safe nursing care score among the studied nurses (n= 250).

Safe nursing care	Systems thinking	
	r	P value
▪ Evaluation of nursing skills	0.958	0.000**
▪ Patient’s psychological needs	0.970	0.000**
▪ Patient’s physical needs	0.947	0.000**
▪ Nurses’ teamwork	0.968	0.000**
Total	0.951	0.000**

*Significant $p \leq 0.05$

**Highly significant $p \leq 0.01$

Discussion:

Systems thinking is aimed to deliver safe patient care through the awareness of the whole healthcare system, its elements, their interactions and the efficiency of utilizing the system resources (Ahmed & Ibrahim, 2023). Any health-care organization must encourage systems thinking because they influence the nurses' knowledge, behaviors, abilities, and attitudes that help them deliver safe nursing care in a quickly changing workplace (Rouzbahan et al., 2022).

In relation to the level of systems thinking among studied nurses? The current study revealed that less than two thirds of the studied nurses had high level of systems thinking while, the minority of them had low level. From the investigator’s point of view this result may be related to the majority of studied nurses hold bachelor degree in nursing which provided them with the ability to understand and interpret complex systems, know the way of viewing, communicating, and understanding relation that determine the functioning of systems, recognize that proposed changes can have an impact on the entire system, and think about how multiple changes affect one another, seeing the whole beyond the parts and

seeing the parts in the context of the whole, think clearly and rationally before accepting any fact or argument result, problem solving which impose efficacy on individuals in addressing problems and finding an ultimate solution.

The study finding was congruent with Moazez et al., (2020), who conducted a study about " Nurses’ perceptions of systems thinking and safe nursing care: ", and noted that the results showed the high level in the systems thinking was related to nurses consult with other health care members in dealing with the clinical risks. Some recommendations and protocols in this regard are rechecking in injection of high-risk medications or blood transfusion that encourages information seeking and asking question among nurses.

the finding was disagreed with Farokhzadian et al., (2018),who conducted a study about “The long way ahead to achieve an effective patient safety culture: challenges perceived by nurses' this result demonstrates the urgent need for enhancing nurses' systems thinking”, and reported that nurses obtained low level of systems thinking related to the relationships among co-workers in the

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work unit and the effect of the change on the outcomes. Highlighted that the consequences of lacking awareness about professional responsibilities and problem solving.

Part (III): The level of safe nursing care among studied nurses

This part answers the second question was “What is the level of safe nursing care among studied nurses?”

The finding of current study showed that more than half of the studied nurses had high level of safe nursing care in relation to evaluation of nursing skills dimension. From the investigator’s point of view, this result may be due to presence of high qualified, skilled and well-trained nurses as most of them had bachelor's degree. In addition, the hospital is accredited which make nurses aware of safety goals and implement them.

The study finding were consistent with Moazez et al., (2020), who noted that the high level of safe nursing skills was related to presence of qualified, skilled and trained nurses for implementing effective techniques to enhance systems approaches. As well as the finding was supported by Ahmed & Ibrahim, (2023), who noted that assessment of the nursing skills was high category as more than three fifth had high level of safe nursing care in relation to evaluation of nursing skills.

The finding was in contrast with Rashvand et al., (2016), who conducted a study about” Iranian nurses' perspectives on assessment of safe care: An exploratory study.” and claimed that the level of safe nursing care was low and safe nursing care was undesired.

For the correlation between systems thinking and safe nursing care it was found that there was a highly statistically significant positive strong correlation between systems thinking and safe nursing care evaluation of (nursing skills, patient’s psychological needs, patient’s physical needs and nurses’ teamwork) among the studied nurses at Menoufia University Hospital? From the investigator’s point of view, this result may be due to increased nurses’ awareness about systems thinking, promoted the nurses’ perception of safety culture and reduced the frequency of medication errors. Nurses who have ability to be responsible and have accountability, knowledge, skills, can communicate effectively and provide quality of care. However, this finding was in contrast with Rashvand et al., (2016), who conducted a study about” Iranian nurses' perspectives on assessment of safe care: An exploratory study” and claimed that safe nursing care was low and undesired, and the level of safe nursing care was low in relation to the systems thinking. Also, the result was in disagreement with Mahsoon and Donalsky, (2021), who told that participants had a low level of systems thinking and noted that systems thinking is a critical component of nursing education that promotes quality and safety as well as the occurrence and reporting of undesirable outcomes.

CONCLUSION

In the light of the current study finding, the study emphasized that, less than two thirds of studied nurses had a high level of systems thinking and more

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than two thirds of them had a high level of safe nursing care while, the minority of them had a low level of both systems thinking and safe nursing care. Moreover, there was a highly statistical significance positive strong correlation between systems thinking and safe nursing care among studied nurses. In addition, regression, coefficient of the independent variable (systems thinking) revealed that systems thinking is a predictor of safe nursing care among studied nurses.

RECOMMENDATIONS

- 1) Hospital management should support and encourage nurses' participation in continuing education programs that help them to acquire necessary skills for advancement of nursing profession.
- 2) Training programs should be developed to enhance nurses' knowledge and skills related to systems thinking and safe nursing care.
- 3) Nursing curricula should all new trends in systems thinking
- 4) Collaboration protocols should be shared between college of nursing and the hospital to increase perception level of systems thinking and safe nursing care.
- 5) This study can be replicated in different health care sectors using larger probability sample with all healthcare professionals for generalization.
- 6) Further study needs to be conducted about barriers affecting uses of systems thinking and safe nursing care in health care settings.

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