

Relation between Level of Empowerment and Problem-Solving Abilities of Nurses at Intensive Care Units

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Abstract:

Background: Nurses in specialty areas as the intensive care units are susceptible to workplace stress due to facing many challenges that make them have to create work place that is optimal for provision of nursing care by motivating, empowering their nurses and problem-solving skills through learning problem solving and decision making process to act independently and autonomously. **Aim:** This study aimed to assess relation between level of empowerment and problem solving abilities of nurses at intensive care units. **Subject and Method: Design:** Descriptive correlational research design was used in this study. **Setting:** This study was conducted at Tanta University Hospitals in intensive care units, Egypt. **Subject:** Consist of all nurses (n=390) from the previously mentioned setting available at time of data collection. **Tools:** Two tools were used to collect data, **Tool (I)** Nurses Empowerment Structured Questionnaire Sheet, **Tool (II)** Nurses' Problem Solving Abilities Questionnaire. **Results:** Nearly one half (45.6%) of nurses had low level of empowerment. While, more than one third (36.9%) of them had moderate level of empowerment. High percent (60.3%) had moderate levels of problem solving abilities. While, more than one quarter (26.4%) had low levels of problem solving abilities. **Conclusion:** There were statistically positive correlation between overall nurses' empowerment including autonomy, participation, responsibility and overall nurses' problem solving abilities including problem solving confidence, approach avoidance style, personal control at $p(<0.001)$. **Recommendation:** It was recommended that encouraging learning system and training program for nurses regarding effective autonomy and empowerment and participates in unit and hospital decision making process.

Keywords: Autonomy, Empowerment, problem solving abilities.

Introduction

A healthy nursing practice environment is defined as nurses accepting personal responsibility for their nursing profession and the patient as a person, and they argue that difficulties arise when the practice environment no longer supports them in their interpersonal nursing practice. ⁽¹⁾ In intensive care units, where nurses perform

at a high level of practice, there are difficulties because of the high environmental pressure, ambiguity and rapid change in their work. Nurses need to be highly trained, empowered, informed, inventive, and adaptable in order to stay up with technological advancements and devise strategies for giving patients quality and safe treatment. ^(2, 3)

Empowerment is a key element of the working environment in intensive care units, and new skills are needed to handle new challenges. Nursing empowerment is the successful participation of nurses in the management of their organizations, decision-making and problem-solving, imagination, accountability and outcome control. ⁽⁴⁾ Another description is a management strategy that involves giving nurses access to knowledge, rewards, and authority, so they may take the initiative and make choices that will enhance service and performance. This is a crucial administrative tactic for developing a healthy workplace. ⁽⁵⁾

Empowerment is based on the idea that supplying nurses with things such as skills, resources, authority, opportunities, and motivation, as well as holding them accountable for the results of their actions that will increase their competence and satisfaction. ⁽⁶⁾ The three components of empowerment are autonomy, decision-making involvement and responsibility. Being independent from outside controls, acting outside the bounds of accepted practice, and being able to direct one's own life and affairs are all examples of autonomy. Examples include making decisions regarding patient care in intensive care units, being free to schedule work and choose the methods to be used to complete it, and creating care processes to enhance patient safety and nursing quality. ^(7,8)

Intensive care nurses are encouraged to get involved and voice their opinions in problem-solving procedures or any suggestions related to patient care that result in a sense of gratitude and empowerment. Participation in decision-making is defined as a complex process

that involves a number of decisions, taking actions to achieve desired outcomes and connecting intensive care nurses. ⁽⁹⁾ Responsibility is described as the amount of dedication and safe care delivery that is in line with the best available research and clinical standards, as well as the overall organizational and system quality that nurses bring to a task or position. ⁽¹⁰⁾

Empowered nurses play an active role in solving problems in their work environments. Therefore, nurses are expected to solve problems effectively without avoiding them, have confidence in their problem-solving abilities and control their emotional reactions and behaviors. ⁽¹¹⁾ Patients who received treatment from nurses who effectively handled difficulties were able to deal with them more effectively on their own, and as problem-solving skills improved. So, did the nurses' personal achievement levels, emotional burnout rates, and state anxiety levels. Conversely, nurses who struggled to find solutions had a greater propensity to suffer from negative experiences such job discontent, increased job stress, and burnout. ⁽¹²⁾

Problem-solving ability is defined as thinking ability, which is seen as a prerequisite for a nurse's practice. Problem-solving starts with the recognition of a situation as a problem, and then it entails choosing the best options from a variety of solutions in order to realize a desired goal and put that goal into action, ⁽¹³⁾ to safely and effectively care for patients with complex and unpredictable requirements, nurses in intensive care units should be learning higher level critical thinking and problem-solving skills. ⁽¹⁴⁾

Problem-solving abilities consist of three dimensions: problem-solving confidence, approach-avoidance style, and personal control. Problem-solving confidence is defined as nurses' confidence in their own abilities to solve a patient's problem effectively. Intensive care Nurses should be able to see opportunities in difficult situations and they should receive encouragement and motivation to develop a problem-solving idea into a sensible course of action. It serves as a gauge of problem-solving effectiveness. ^(15, 16)

Approach-avoidance style of nursing is defined as the tendency of nurses to avoid problem solving. To overcome this, intensive care nurses should be able to identify problems and find ways to solve them. ⁽¹⁷⁾ Personal control is the intensive care nurse's capacity to manage emotions and actions while addressing the patient's issue. Effective nursing solutions depend on nurses' ability to control their emotional responses and behaviors. ⁽¹⁸⁾

Significance of the study:

Nursing has become a field where empowerment has considered a key need factor. Nurses in intensive care units leave their positions because of negative experiences of unrealistic workloads, rapid healthcare environment changes and due to feeling powerless, unheard and undervalued ⁽¹⁹⁾. So, nurses need to have high level of empowerment to have control over their nursing practice, share responsibilities, solve problems and make effective decisions independently and autonomously in critical situations. Where, disempowered nurses are demotivated, unable to accomplish desired activities and frustrated with work environment. It is expected that such study examines nurses' level of empowerment and their problem

solving abilities will help to accomplish workplace tasks in a highly competitive demanding situations. ⁽²⁰⁾

The aim of the study:

Assess relation between level of empowerment and problem solving abilities of nurses at intensive care units.

Research Questions:

1. What are the levels of empowerment and problem solving abilities among nurses at intensive care units?
2. What is a relation between nurses' empowerment and their problem solving abilities?

Subjects and method:

Study design:

Descriptive correlational research design was used in this study.

Settings: This study was conducted at Tanta University Hospitals in intensive care units (ICUs) including (Emergency Anesthesia ICU, Emergency Medical ICU, Neonatal Intensive Care Unit, Pediatric ICU, Neurological ICU, Cardiac ICU, Ophthalmology Anesthesia ICU, Chest ICU, and General Medical ICU).

Subjects: The study subjects will consist of all nurses (n=390) from the previously mentioned setting available at time of data collection as follows: Emergency Anesthesia ICU(n=60), Emergency Medical ICU(n=53), Neonatal Intensive Care Unit (n=89), Pediatric ICU (n=40), Neurological ICU (n=52), Cardiac ICU(n=25), Ophthalmology Anesthesia ICU (n=20), Chest ICU(n=16), and General MedicalICU(n=35).

Tools of data collection:

To achieve the aim of study, the following two tools were used;

Tool I: Nurses Empowerment Structured Questionnaire:

This tool was developed by the investigator based on recent related literature^(21, 22) to assess levels of nurses' empowerment. It consisted of two parts as follows:

Part 1: Personal characteristics of nurses included age, years of experience, unit, marital status and educational qualification.

Part 2: Nurses' Empowerment Questionnaire. This part included three subscales as follows:

- Autonomy items include 18 items.
- Responsibility items include 24 items.
- Participation items include 11 items.

Scoring system:

Nurses' responses were measured on a five points Likert Scale ranged from 1-5 where (1) strongly disagree (2) disagree (3) neutral (4) agree and (5) strongly agree. The total score was calculated by summing of all categories and high score indicated high empowerment level based on cut of point as follows:

- High Level of empowerment $\geq 80\%$.
- Moderate level of empowerment 65% - <80%.
- Low level of empowerment <65%.

Tool II: Nurses' Problem-Solving Abilities Questionnaire

This tool was developed by Heppner and Soresi (2009)⁽²³⁾ and modified by the investigator. It used to assess nurses' problem-solving abilities. This tool included three subscales as follow;

- Problem solving confidence include 11 items.
- Approach avoidance style include 6 items.
- Personal control includes 5 items.

Scoring system:

Nurses' responses were measured on a five points Likert Scale ranged from 1-5 where (1) never to (5) always. The total score

calculated by summing of all categories into levels of nurses' problem solving ability based on cut of point as follows:

- High Level of problem solving ability $\geq 80\%$,
- Moderate level of problem solving ability 65% - <80%,
- Low level of problem solving ability <65%.

Methods of data collection:

1. Official permission to conduct the study was obtained from the Dean of faculty of nursing to Tanta University Main Hospital and submitted to the responsible authorities of the selected setting.

2. Ethical consideration:

a) Approval of ethical committee obtained of Faculty of Nursing

b) Nature of the study was not causing any harm or pain to the nursing staff.

c) Nurses consent to participate in the study obtained after informed them about the privacy of information, nature of the study, their right to withdraw and confidentiality of their data.

d) Confidentiality and privacy were taken in to construction regarding data collection.

3. Tools I and II were translated into Arabic and presented to a jury of five experts in the area of specialty to check their content validity and clarity of questionnaire. The experts were; three Professors of nursing services administration and two assistant professors of nursing services administration from Faculty of Nursing, Tanta University.

4. The experts' responses were represented in four points rating scale ranging from (1-4); 4= strongly relevant, 3= relevant, 2= little relevant, and 1= not relevant. Necessary modifications were done including; clarification, omission of certain

items and adding others and simplifying work related words.

- The face validity value of tool (I) part 2: Nurses' empowerment questionnaire 94.34%, tool (II) part 2: Nurses' problem solving abilities questionnaire 98.86%.

5. A pilot study was carried out on a sample (10%) of nurses (n=39) nurses, and they excluded from the main study sample during the actual collection of data. A pilot study was carried out after the experts' opinion and before starting the actual data collection. The pilot study was done to test clarity, sequence of items, applicability, and relevance of the questions and to determine the needed time to complete the questionnaire. According to feedback from pilot study, the tool was modified by the researcher. The estimated time needed to complete the questionnaire items from head nurses and their staff nurses was (20 - 30) minutes.

6. Reliability of tools was tested using Cronbach Alpha Coefficient test. Reliability of tool (I) part (2) Nurses' empowerment questionnaire= 0.974 and reliability of tool (II) part (2) Nurses' problem-solving abilities questionnaire =0.862.

7. Nurses' empowerment questionnaire and Nurses' problem solving abilities questionnaires were used to collect data from nursing staff.

8. **Data collection phase:** the data were collected from nurses by the researcher. The researcher met the respondents' nurses in different areas under study during working hours to distribute the questionnaire. The subjects recorded the answer in the presence of the researcher to ascertain that all questions were answered. The data was collected over period of two

months started from October 2021 until December 2021

Statistical analysis:

The collected data were fed to the computer, organized, tabulated and statistically analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. Significance of the obtained results was judged at the 5% level. The correlation between two variables was calculated using Pearson's correlation coefficient. The level of significant was adopted at $p < 0.05$

Results:

Table (1): Shows levels of empowerment among nurses at intensive care units.

This table revealed that high percent (65.1%) of nurses had low level of participation dimension. While, more than half (53.8%) of them had high level of responsibility. And more than half (52.6%) had low level of autonomy dimension of empowerment

Table (2): Shows levels of problem-solving abilities among nurses at intensive care units. The table shows that more than half (57.9%, 53.3%) of nurses had moderate level in problem solving confidence ability and approach avoidance style. Also, half (50%) of them had moderate level of personal control.

Table (3): Represents correlation between nurses' empowerment and their problem-solving abilities.

The table shows the correlation between overall nurses' empowerment including autonomy, participation, responsibility and overall nurses' problem-solving abilities including problem solving confidence, approach avoidance style, personal control at $p (< 0.001)$.

Table (5): Shows relation between nurses' empowerment and their personal characteristics. Based on the table there wasn't statistically significant difference between all items of nurses' personal characteristics and their empowerment levels except their department statistically correlation found at ($p < 0.001^*$)

Table (6): Represent relation between nurses' problem-solving abilities and their personal characteristics. The table shows there wasn't statistically significant differences between all items of nurses' personal characteristics and their problem-solving abilities except their years of experience at ($p = 0.046^*$) and marital status at ($p = 0.009^*$)

Table (1): Levels of empowerment among nurses at intensive care units (n= 390)

Empowerment main dimensions	High Level ($\geq 80\%$)		Moderate level (65%- 80 %.)		Low level ($\leq 65\%$)	
	No.	%	No.	%	No.	%
Autonomy	58	14.9	127	32.6	205	52.6
Participation	82	21.0	54	13.8	254	65.1
Responsibility	210	53.8	162	41.5	18	4.6

Table (2): Levels of problem-solving abilities among nurses at intensive care units (n= 390)

Problem-solving abilities main dimensions	High Level ($\geq 80\%$)		Moderate level (65 % <80%.)		Low level ($< 65\%$)	
	No.	%	No.	%	No.	%
Problem-solving confidence	71	18.2	226	57.9	93	23.8
Approach-avoidance style	56	14.4	208	53.3	126	32.3
Personal control	70	17.9	195	50.0	125	32.1

Table (3): Correlation between nurses' empowerment and their problem-solving abilities (n = 390)

Nurses' Problem-Solving Abilities		Part 2: Nurses' Empowerment			
		Autonomy	Participation	Responsibility	Overall Nurses' Empowerment
Problem-solving confidence	r	0.184*	0.248*	0.158*	0.258*
	p	<0.001*	<0.001*	0.002*	<0.001*
Approach-avoidance style	r	0.252*	0.219*	0.116*	0.252*
	p	<0.001*	<0.001*	0.022*	<0.001*
Personal control	r	0.136*	0.132*	0.117*	0.155*
	p	0.007*	0.009*	0.020*	0.002*
Overall Tool II: Nurses' Problem-Solving Abilities	r	0.258*	0.287*	0.186*	0.313*
	p	<0.001*	<0.001*	<0.001*	<0.001*

r: Pearson coefficient

***: Statistically significant at $p \leq 0.05$**

Table (4): Relation between nurses' empowerment and their personal characteristics (n= 390)

Personal characteristics	Nurses' Empowerment levels						χ^2	p
	Low level of empowerment (<65 %.) (n = 178)		Moderate level of empowerment (65% - <80 %.) (n=144)		High Level of empowerment (≥80 %.) (n=68)			
	No.	%	No.	%	No.	%		
Age								
< 30	75	42.1	55	38.2	23	33.8	2.846	0.584
30 – 40	67	37.6	60	41.7	26	38.2		
≥ 40	36	20.2	29	20.1	19	27.9		
Years of Experience								
< 5	60	33.7	39	27.1	17	25.0	4.203	0.379
5 - 15	67	37.6	67	46.5	28	41.2		
≥ 15	51	28.7	38	26.4	23	33.8		
Department								
Emergency Anesthesia ICU	17	9.6	31	21.5	12	17.6	45.112 *	<0.001 *
Emergency Medical ICU	30	16.9	14	9.7	9	13.2		
Neonatal Intensive Care Unit	37	20.8	34	23.6	18	26.5		
Pediatric ICU	20	11.2	14	9.7	6	8.8		
Neurological ICU	35	19.7	11	7.6	6	8.8		
Cardiac Care Unit	4	2.8	17	9.6	4	5.9		
Ophthalmology Anesthesia ICU	4	2.2	13	9.0	3	4.4		
Chest ICU	1	0.6	11	7.6	4	5.9		
General Medical ICU	17	9.6	12	8.3	6	8.8		
Marital status								
Divorced	113	63.5	96	66.7	44	64.7	0.656	0.957
Married	54	30.3	41	28.5	21	30.9		
Single	11	6.2	7	4.9	3	4.4		
Educational qualification								
Bachelor of Science Nursing	74	41.6	71	49.3	34	50.0	3.549	0.737
Nursing Technical Institute	69	38.8	45	31.3	21	30.9		
Technical Secondary School	22	12.4	16	11.1	9	13.2		
Diploma in Nursing	13	7.3	12	8.3	4	5.9		
Master's degree								

χ^2 : Chi square test *: Statistically significant at $p \leq 0.05$

Table (5): Relation between nurses' problem-solving abilities and their personal characteristics (n= 390)

personal characteristics	Tool II: Nurses' Problem-Solving Abilities						χ^2	p
	Low (n =103)		Moderate (n=235)		High (n=52)			
	No.	%	No.	%	No.	%		
Age								
< 30	51	49.5	83	35.3	19	36.5	6.985	0.142
30 – 40	32	31.1	101	43.0	20	38.5		
≥ 40	20	19.4	51	21.7	13	25.0		
Years of Experience								
< 5	40	38.8	60	25.5	16	30.8	9.683*	0.046*
5 – 15	32	31.1	111	47.2	19	36.5		
≥ 15	31	30.1	64	27.2	17	32.7		
Department								
Emergency Anesthesia ICU	10	9.7	40	17.0	10	19.2	16.104	0.446
Emergency Medical ICU	15	14.6	28	11.9	10	19.2		
Neonatal Intensive Care Unit	19	18.4	58	24.7	12	23.1		
Pediatric ICU	13	12.6	24	10.2	3	5.8		
Neurological ICU	16	15.5	30	12.8	6	11.5		
Cardiac ICU	5	4.9	17	7.2	3	5.8		
Ophthalmology Anesthesia ICU	7	6.8	10	4.3	3	5.8		
Chest ICU	3	2.9	10	4.3	3	5.8		
General Medical ICU	15	14.6	18	7.7	2	3.8		
Marital status								
Divorced	53	51.5	162	68.9	38	73.1	13.499*	0.009*
Married	45	43.7	60	25.5	11	21.2		
Single	5	4.9	13	5.5	3	5.8		
Educational qualification								
Bachelor of Science Nursing	43	41.7	102	43.4	34	65.4	9.414	0.152
Nursing Technical Institute	38	36.9	85	36.2	12	23.1		
Technical Secondary School	14	13.6	29	12.3	4	7.7		
Diploma in Nursing	8	7.8	19	8.1	2	3.8		

 χ^2 : Chi square test

Discussion:

Nursing practice environment's pressures in intensive care units is a very stressful, where expensive care is delivered to critically ill patients and have emotional problem associated with patient suffering, death and heavy work that making nurses physically and emotionally strong to meet the challenge of creating a patient driven health care system⁽¹⁾ **Regarding the level of empowerment among nurses at intensive care units.** The present study results revealed that nearly half of nurses had low level of empowerment. This is due to that high percent and more than half of nurses had low level of participation in decision making and autonomy in intensive care units. This result consistent with **Aljameez (2021)**⁽⁶⁾, **Dahiya (2021)**⁽²⁴⁾, **Gamal (2020)**⁽²⁵⁾, **Halvorsen (2020)**⁽²⁶⁾, **Radwan (2019)**⁽²⁷⁾ and **Ali(2018)**⁽²⁸⁾ whose reported that nurses had low level of empowerment in practice.

On country, **Yassen et al., (2021)**⁽²⁹⁾ whose founded that nurses had higher levels of empowerment due to feeling of high level of empowering behavior based on head nurses' interactions with the patient, physicians, and working with their staff nurses as a team. Moreover, **Cummings et al., (2018)**⁽³⁰⁾ stated that when head nurse had the capacity to demonstrate empowerment in their practice will enhance patient, staff and unit outcomes through provide them learning, training and coordination that leads to higher team performance.

Regarding the problem-solving abilities among nurses at intensive care units. The present study results revealed that more than half of nurses had moderate levels of problem-solving ability. This may be due to that high percent of nurses had

moderate level of problem-solving confidence, approach avoidance style and personal control when solving problems. This result consistent with **Ibrahim (2020)**⁽³¹⁾, **Ahmady (2020)**⁽³²⁾ and **Durmaz (2018)**⁽³³⁾ whose reported that nurses had moderate level of problem solving ability when dealing with situation.

As evidence the present study showed that nurses had moderate level toward problem solving abilities this may be due to shortage in intensive care units that increase cooperation and coordination when make unit coverage that increase interpersonal relationship and they willing to seek information, gather data, work in order way, so they gain experience and able to deal with these problems. This result consistent with **Abo-Elyzeed et al., (2019)**⁽³⁴⁾ and **Toddet al., (2018)**⁽³⁵⁾ whose reported that the importance of improvement of problem-solving competencies in teams, and the fact that affective outcomes (e.g., trust and team potency) and process outcomes (e.g., coordination and cooperation) are helpful to team solving patients' problem.

On country, **Ocak et al., (2021)**⁽³⁶⁾ and **Hassanet al., (2020)**⁽³⁷⁾ whom founded those nurses had low level of problem-solving ability due to low nurses' problem-solving skills that decrease their ability to solve problems and expressing themselves effectively.

Regarding the correlation between nurses' empowerment and their problem-solving abilities: As observed in this study, there was a correlation between nurses' empowerment and their problem-solving abilities among intensive care units nurses. This means that nurses' empowerment has a positive impact on their problem-solving abilities. Along with

the present finding, **Eyuboglu et al., (2019)** ⁽³⁸⁾ discovered that significant correlation between nurses' empowerment and their problem-solving abilities. likewise, **Lassoued et al., (2020)** ⁽³⁹⁾ whose found statistically significant positive association among managerial empowerment on problem solving and decision making skills.

This study result might be interpreted by, there was statistically significant difference between nurses' empowerment and their department. This result consistent with **Wahlin (2017)** ⁽⁴⁰⁾ and **Kuokkanen et al., (2016)** ⁽⁴¹⁾ whose reported that there was statistically significant difference between nurses' empowerment and their intensive care units.

In the present study there was statistically significant difference between nurses' problem-solving abilities and their personal characteristic also in years of experience and marital status. This result consistent with **Kim et al., (2020)** ⁽⁴²⁾ whom reported that there was statistically significant difference between nurses' problem-solving abilities and their years of experience and marital status.

The present finding was supported by **Gottlieb et al., (2021)** ⁽⁴³⁾ in their results they found that leader empowering behavior has a positive effect on nurses perceptions. When nurses are empowered, they feel more competent, in control and experience appositve sense of personal connection to work. Furthermore, **Abdelatti et al., (2022)** ⁽⁴⁴⁾ who stated that professional practice environment helps nurses to control over practice, involvement of in decisions and enhance relationships with team members which strengthen the empowerment, decision

making, critical thinking, innovation and problem solving.

From above discussions observed that nurses suffer from sever difficulties and hardships during their working as mentioned before at intensive care units. Therefore, empowerment in nursing is vital in enabling nurses to cope or manage with ICUs stress and pressures during their work to make positive change, participate in clinical and administrative decisions and achieve the goals of hospital that can influence their ability to practice in a professional manner, ensuring excellent patient care quality and positive organizational outcomes. Therefore, it is crucial for nurse managers to create opportunities for staff nurses' personal and professional development and design administrative regulations supporting their autonomy, responsibility, and participation in decisions. ⁽⁴⁴⁾

Conclusion:

- Based on the finding of the present study it was concluded that:
- Nearly one half of nurses had low level of empowerment; high percent of nurses had low level of participation in decision making. Also, more than half of them had low level of autonomy dimension and more than half of them had high level of responsibility.
- Regarding problem solving abilities it was showed that high percent of nurses had moderate level of problem solving abilities. While, more than one quarter had low level of problem solving abilities. Also, more than half of nurses had moderate level of problem solving confidence ability and approach avoidance style and half of them had moderate level of personal control dimension. Positive

correlation was detected between overall nurses' empowerment and their overall problem solving

Recommendation:

It was recommended that hospital management using encouraging learning system and training program for nurses regarding effective autonomy and empowerment and participate in unit and hospital decision making process.

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