# Performance Obstacles Experiences Among Critical Care Nurses in Damanhur Teaching Hospital

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**Abstract** The work environment of intensive care nurses may have substantial impact on both nursing outcomes and patient safety. Performance obstacles are the factors that hinder intensive care nurses' capacity to perform their jobs and that are associated closely with their immediate work environment**. Aim:** To identify the performance obstacles experienced by critical care nurses in their work environment that covers all elements of the work system model. **Subject and methods:** An exploratory, descriptive design was utilized. The sample included all available nurses (n=60). Data was collected by using questionnaire performance obstacles. It was conducted in Damanhur teaching hospital in Damanhur city in 2 critical care units. **Results:** indicated that nurses experience in critical care units a wide variety of performance obstacles that cover all elements of the work system model. **Conclusion:** Performance obstacles represent the following elements of the work system: environment (6 obstacles), organization (7 obstacles), technologies or tools (4 obstacles), and task (4 obstacles).

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## 1. Introduction

A critical care unit is a dynamic and highly technological environment. Professional nurses who have been working in the critical care unit for a period of time are passionate about the environment in which they work. They find their on duty time challenging and stimulating. The critical care environment is slowly changing due to the fact that there are fewer professional nurses with an additional qualification in critical care available to work in the critical care units **(Dunsdon, 2011).** The work environment of intensive care nurses may have substantial impact on both nursing outcomes and patient safety. Performance obstacles are the factors that hinder intensive care nurses' capacity to perform their jobs and that are associated closely with their immediate work environment**. (Gurses and Carayon, 2007)**

Intensive care nurses play a key role in patients' recovery. They must respond continuously and quickly to the needs of patients and families, carry out procedures accurately, and interact with the most intense emotional aspects of life. They work in demanding and stressful work environments to help patients in critical conditions. In addition, patient safety and quality of care are major problems in intensive care units. Characteristics of the ICU work environment can create obstacles for nurses in performing patient care tasks, therefore threatening the quality and safety of care provided by nurses. Factors such as interruptions, overwork, fatigue, illegible physician writing, lack of information about the patient, and problems with equipment can increase the likelihood of medication administration errors by nurses **(Institute of Medicine, 2004).**

Performance obstacles have significant impact on nursing workload, perceived quality and safety of care, and quality of working life(QWL). Workload mediates the effects of performance obstacles on perceived quality and safety of care and QWL. Factors that affect QWL of ICU nurses include high workload; task complexity; high patient mortality and morbidity; unnecessary prolongation of life; emergencies, admissions, and transfers; communication problems with coworkers; high noise level; low autonomy; insufficient or malfunctioning equipment; and frequent use of sophisticated technology. Studies have found that inadequate staffing, admissions and transfers, and a high number of severely sick patients can increase ICU nursing workload. (Re)designing ICU work systems by reducing performance obstacles may be an effective strategy for reducing workload and improving quality and safety of care as well as QWL among nurses, thereby complementing the efforts on optimizing the nurse/patient ratio. **(Gurses *et al.*, 2009)**

Performance obstacles concept can also be used to identify problems in other health care settings, for other types of care providers and patients. In addition to , Performance errors were classified as skill based errors (failure to carry out intended plans of action, including unintended acts and lapses or omitted acts), rule-based mistakes (such as using an incorrect treatment protocol), and knowledge-based mistakes. **(Gurses and Carayon, 2007)**

The heavy workload of hospital nurses is a major problem for health care system. Nurses are experiencing higher workloads than ever before due to four main reasons: increased demand for nurses, inadequate supply of nurses, reduced staffing , overtime, and reduction in patient length of stay**.( Lang *et al.,* 2004).** Furthermore, performance obstacle and workload are negatively affects nursing job satisfaction and, as a result, contributes to high turnover and the nursing shortage. In addition to the higher patient acuity, work system factors and expectations also contribute to the nurses' workload: nurses are expected to perform nonprofessional tasks such as delivering and retrieving food trays; housekeeping duties; transporting patients; and ordering, coordinating, or performing ancillary services**.** The five elements of the work system are task; organizational factors; environment; equipment and technology; and individual. Performance obstacles can arise from any element of the work system or from interactions between the elements of the work system. **(Gurses and Carayon, 2007)**

**Aim:**

This study aim to identify the performance obstacles experienced by critical care nurses in their work environment that covers all elements of the work system model.

## 2. Subjects and Methods

**Research design**

An exploratory, descriptive design was utilized to accomplish the study.

**Sample:**

The sample included all available nurses (n=60)were assigned to work in the critical care units in Damanhur teaching hospital in Damanhur city, data were collected between July to September (2011). The nurses are working in the following critical care units:

Intensive care unit

Cardiac care unit

**Setting**

The study was conducted in Damanhur teaching hospital in Damanhur city in the critical care units that mentioned above.

**Tools for Data Collection:**

Data was collected by using A questionnaire was developed, validated from Gurses and Carayon (2007)

**Tool I- Socio demographic data:**

It was contain information related to demographic characteristics of the studied nurses as their sex, age, social status, and educational degree, total experience in nursing field, hospital work and intensive care units.

**Tool II: critical care units background variables**

It was contain number of hours worked in critical care units, preferable shift for work, total numbers of patients responsible for, number of patients admitted to critical care units, number of isolated patients, number of daily discharge patient, number of assistant nurses; clerk, and work environment.

**Tool III: Performance Obstacles assessment Questionnaire:**

The questionnaire included 37questions about the performance obstacles experienced by critical care nurses during a particular shift. Twenty-four items had a nominal scale (yes or no) and 13 items had a semantic differential response format with a 5-point rating scale and bipolar adjective pairs such as organized-disorganized and noisy-quiet. Combinations of positively and negatively worded items were used in the questionnaire. For example, for the item ''I spent much time searching for patients' charts,'' the response category of yes indicated that the nurse experienced that obstacle, whereas for the item ''the isolation rooms that I worked in were well-stocked,'' the response category of no meant that the nurse experienced an obstacle. Questions on demographic and were also included in the questionnaire.

**Methods of Data collection:**

**Ethical Consideration:**

Human rights and ethical permission were obtained to conduct the study. An official permission was obtained from Damanhur faculty of nursing dean and then the official permission was obtained from Damanhur teaching hospital director. Nurses were fully informed of the study. The voluntary nature of participation was stressed as well as confidentiality. Consent was obtained from each nurse.

**Pilot Study:**

A pilot study of the questionnaire was conducted to: (a) estimate the time necessary for nurses to fill out the entire questionnaire; (b) ensure that all the important obstacles and facilitators were covered in the questionnaire, all the questions were relevant, and nothing was missing (content validity); (c) test the clarity of the questions (whether any question was unclear or ambiguous); (d) identify the most appropriate response categories for specific questions; and (e) Test whether there was any question that might frustrate nurses.

**Data collection procedures:**

The interview sheet was filled out individualized with the nurse in the intensive care unit and cardiac care unit. Data was collected from the selecting settings by the researchers using the pre constructed tools. 1) Each nurse was individually filling

questionnaire ; the questionnaire was collected from 3 shifts by all the nurses while they are on duty, purpose of the study was explained prior to get the questionnaire sheet, and it distributed to be answered within (30 -45 minutes) then collected. 2) The questionnaire was filling from 1-2 nurses per day started from July to September 2011, over a period of 3 months starting according to nurses' schedule for attendance to the hospital and availability of time for both nurses and their units.

**Data Analysis Plan:**

Descriptive statistics were used to summarize demographic characteristics of the critical care nurses to give an overview results for the instruments. Data were revised, coded, analyzed and tabulated using the number and percentage distribution and carried out using SPSS version 16. The statistical tests used are chi square test. A value of $p<0.05$ was considered to be statistically significant.

**Scoring system:**

The performance obstacle sheet is contains 3 main parts the first one concerned with 24 questions ranged from yes, No, I cannot rule and positive it's scores ranged from 1 to yes answer, 2 for No and zero for I can't rule after organization were done for all statements and negative it's scores ranged from 2 to yes answer, 1 for No and zero for I can't rule. While the second part is contains 4 main parts contains questions regarding assistant nurse if available. The possible choice for each item was; Very disciplined, Disciplined, Disciplined fairly, Undisciplined and Late each one scores for each questions ranged from 4 to zero respectively. The final part in satisfaction assessment tool was questions regarding place of work especially in the morning shift. It contains 4 questions and it's scores for first questions ranged from zero to 4 for very noisy , noisy , noisy some times , Somewhat quiet, very quiet respectively , second questions scores was ranged from zero to 4 for very crowded , crowded , crowded sometimes, wide respectively ,third questions ranged from zero to 4 for very difficult Critical , Sometimes difficult , Somewhat difficult and Calm . The last question was ranged from zero to 4 for Very confused, muddled, confused at times, somewhat confusingly, the organized respectively.

**Limitation of study**

One limitation of the study was the use of a single data collection method (a self-administered questionnaire) which may have biased the results. Nurses who filled out the questionnaire during busy shifts (high patient acuity and load) may have no time to mention their obstacles in details. The questionnaire was designed to ask about performance obstacles as objectively as possible, therefore trying to minimize biases due to individual or emotional variables.

**3. Results**

Table (1) describes that the half of the nurses were ranged age (26-34) years. The majority (98.3%) of nurses were married and females. Also, it reflect (68.3%) of them had nursing diploma. As regard nursing experience (88.3%) of nurses had an experience more than 6 years.

Table (2): Shows that (33.3%) of the nurses had ICU experience ranged between (4-6) years. The majority of the studied nurses were working 8 hours daily in ICU. As regard favorable work time (61.7%) of the nurses choose the morning shift in ICU. Also, it reflect that (65%) of nurses were responsible to give nursing care for more than 5 patients in ICU. While, (48.3%) of them had only one assistant nurse to help them in nursing care.

Figure (1): shows that (45%) of the nurses selected the number of patients' admissions by each nurse over the shift in ICU was more than 5 patients.

Figure (2): illustrates that (48.3%) of the nurses' experience with (2-4) patients daily transfer out of the ICU

Figure (3): illustrates that (75%) of the nurses' experience with (5) patients daily were isolated in the ICU

Table (3): demonstrates the performance obstacles related to environment in work system that included insufficient work place for completing paper work (40%), patients' room full with visitors(36.7%),receiving many phone calls from patients (33.4%), distractions from family members (31.7%) receiving many phones calls from family members(25%)

Table (4) shows the performance obstacles related to organization in work system that included change of shift report(s) took longer than they should ; inadequate information given to me by the previous shift's nurse(s) during the shift change (25%); getting adequate information from physicians about my patient(s) (21.7%) and delay in seeing new medical orders for my patient(s) (20%).

Table (5) demonstrates the performance obstacles related to Technology or Tools in work system that included the isolation rooms were not well stocked (60%), the central stock area was not well-stocked (25%), having to use equipment that was in poor condition (21.7%). waiting to use a piece of equipment because someone else was using it. (20%)

Table (6) illustrates the performance obstacles related to Tasks in work system that included Responsible for orienting a nurse (100%), Spending a considerable amount of time teaching my patient(s) or family members(66.6%), Spending time dealing with

family needs(50%), Accompanying a patient during intra-hospital transport today(33.4%).

Table (7) demonstrates performance obstacles related to organization and work environment that included Help from Nursing Assistants, Help from Other Nurses, Help from Unit clerk, work environment (56.7%, 76.7%, 55%, and 28.3%) respectively with statistically significant difference ($p \leq 0.05$).

**Table (1): Number and percent distribution of the nurses according to socio demographic characteristics**

| Items | No | Percent |
|---|---|---|
| Age | | |
| Less than 25 | 5 | 8.3 |
| 26-34 | 30 | 50.0 |
| 35-44 | 21 | 35.0 |
| 45-54 | 3 | 5.0 |
| More than 55 | 1 | 1.7 |
| Total | 60 | 100.0 |
| Sex | | |
| Male | 1 | 1.7 |
| Female | 59 | 98.3 |
| Total | 60 | 100.0 |
| Social status | | |
| Married | 59 | 98.3 |
| Single | 1 | 1.7 |
| Total | 60 | 100.0 |
| Education | | |
| Diploma | 41 | 68.3 |
| Associate nurse | 3 | 5.0 |
| Bachelor | 16 | 26.7 |
| Total | 60 | 100.0 |
| Nursing experience | | |
| Less than year | 1 | 1.7 |
| 1-5 | 2 | 3.3 |
| 4-6 | 4 | 6.7 |
| More than 6 | 53 | 88.3 |
| Total | 60 | 100.0 |

**Table (2): Number and percent distribution of the nurses regarding critical care units background variables**

| Items | No | percent |
|---|---|---|
| ICU experience | | |
| Less than year | 10 | 16.7 |
| 1-3 | 13 | 21.7 |
| 4-6 | 20 | 33.3 |
| More than 6 | 17 | 28.3 |
| Total | 60 | 100.0 |
| Daily Work hours in ICU | | |
| 4hours | 3 | 5.0 |
| 8hours | 57 | 95.0 |
| Total | 60 | 100.0 |
| Favorable work time | | |
| Morning shift | 37 | 61.7 |
| Afternoon shift | 14 | 23.3 |
| Night shift | 3 | 5.0 |
| I do not like work time | 6 | 10.0 |
| Total | 60 | 100.0 |
| Daily patients numbers who give them nursing care | | |
| One patient | 4 | 6.7 |
| Two patient | 4 | 6.7 |
| 2-4 patients | 13 | 21.7 |
| More than 5 patients | 39 | 65.0 |
| Total | 60 | 100.0 |
| Numbers Assistant nurses | | |
| 1 | 29 | 48.3 |
| 2 | 12 | 20.0 |
| 3 | 4 | 6.7 |
| 4 | 5 | 8.3 |
| 5 | 10 | 16.7 |
| Total | 60 | 100.0 |

**Table (3): Number and percent of critical care nurses' experience about performance obstacles according elements of the work system model regarding Environment obstacles**

| Performance Obstacles related Environment* | No | % |
|---|---|---|
| Insufficient place to sit down and do my paperwork in the unit | 24 | 40 |
| Pts' room full with visitors | 22 | 36.7 |
| Patients' rooms were organized. | 11 | 18.3 |
| Receiving many phone calls from family members. | 15 | 25 |
| Distractions from family members. | 19 | 31.7 |
| Receiving many phone calls from pts. | 20 | 33.4 |

*Carayon&Smith,2000

**Fig (1): Pie charts of the nurses' opinion regarding daily numbers of Patients Admission in critical care units**

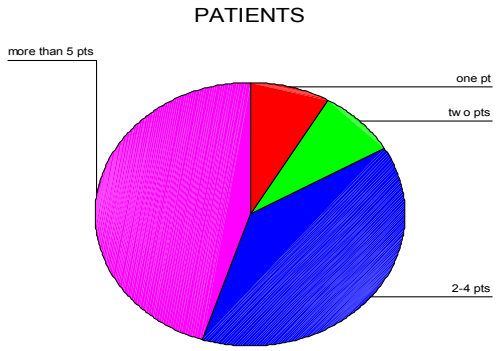



**Figure (2): Pie charts of the nurses' opinion regarding numbers of transferred Patients from critical care units**

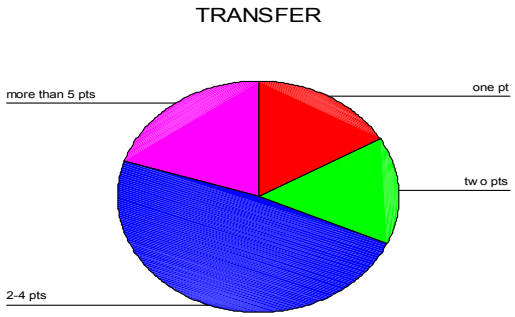



**Figure (3): Bar charts of the nurses' opinion regarding numbers of isolated patients incritical care units**

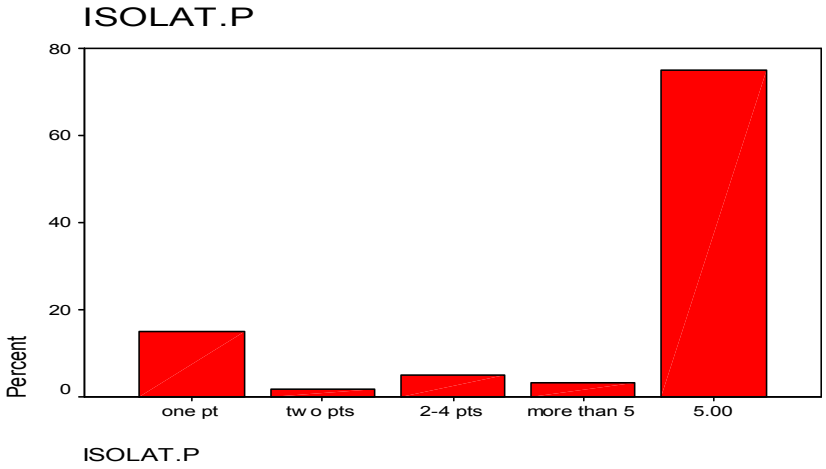



**Table (4): Number and percent of critical care nurses' experience about performance obstacles according elements of the work system model regarding Organization obstacles**

| Performance Obstacles Organization* | No | % |
|---|---|---|
| Delay in getting medications for my patient(s) from pharmacy. | 11 | 18.3 |
| Getting adequate information from physicians about my patient(s). | 13 | 21.7 |
| Change of shift report(s) took longer than they should. | 15 | 25 |
| Delay in seeing new medical orders for my patient(s). | 12 | 20 |
| Spending time searching for my patients' charts. | 6 | 10 |
| Inadequate information given to me by the previous shift's nurse(s) during the shift change | 15 | 25 |
| Unnecessarily information given to me by the previous shift's nurse(s) during the shift change report | 6 | 10 |

*Carayon&Smith,2000

**Table (5): Number and percent of critical care nurses' experience about performance obstacles according elements of the work system model regarding Technology or tools obstacles**

| Performance Technology or Tools Obstacles* | No | % |
|---|---|---|
| Having to use equipment that was in poor condition. | 13 | 21.7 |
| Spending time looking for equipment because it was not located where it was supposed to be. | 10 | 16.7 |
| Waiting to use a piece of equipment because someone else was using it. | 12 | 20 |
| Spending time seeking for supplies in the central stock area. | 6 | 10 |
| The central stock area was well-stocked. | 15 | 25 |
| The isolation rooms that I worked in were well-stocked. | 36 | 60 |
| The patient rooms that I worked in were well-stocked. | 6 | 10 |

*Carayon&Smith,2000

**Table (6): Number and percent of critical care nurses' experience about performance obstacles according elements of the work system model regarding Tasks obstacles**

| Performance Tasks obstacles* | No | % |
|---|---|---|
| Responsible for orienting a nurse. | 60 | 100 |
| Spending time dealing with family needs | 30 | 50 |
| Spending a considerable amount of time teaching my patient(s) or family members. | 40 | 66.6 |
| Accompanying a patient during intra-hospital transport today. | 20 | 33.4 |

*Carayon&Smith, 2000

**Table (7): Number and percent of critical care nurses' experience about organization and Environment performance obstacles related to assistance nurses, secretary and work environment**

| Items | No Obstacles | | Obstacles | | $x^2$ |
|---|---|---|---|---|---|
| | No | % | No | % | |
| Help from Nursing Assistants (Organization) | 26 | 43.3 | 34 | 56.7 | .000* |
| Help from Other Nurses(Organization) | 14 | 23.3 | 46 | 76.7 | .000* |
| Help from Unit clerk(Organization) | 27 | 45.0 | 33 | 55.0 | .000* |
| work environment (Environment) | 43 | 71.7 | 17 | 28.3 | .000* |

*Carayon&Smith,2000

## 4. Discussion

The aim of this study was to identify the performance obstacles experienced by critical care nurses in their work environment that cover all elements of the work system model. The work system model **(Carayon & Smith, 2000)** provides a macro ergonomic conceptual framework to identify performance obstacles in ICU work environments. The five elements of the work system are task; organizational factors; environment; equipment and technology; and individual**.** Performance obstacles can arise from any element of the work system or from interactions between the elements of the work system.

This study revealed some important findings about impact of various performance obstacles on nursing workload, nursing quality of working life, and quality and safety of care, as well as the impact of interventions aimed at redesigning the work system of ICU nurses to remove performance obstacles. The study revealed that half of the studied sample age ranged between (26–34) years, (Table1). This result was agreed by **Kotzer *et al.,* (2006)** stated that respondents primarily ranged in age from 20 to 35 years, **Abd El-Latif (2004),** who found that more than two fifth of nurses aged 25 years, while **Kim *et al.,* (2008),** found that most of nurses ages ranged between 35 up to 53years.

Regarding nurses qualification and marital status, the current study found that 68.3% of nurses had nursing diploma and (98.3%) were married and female (Table 1). These results were agreed with **Todd *et al.,* (2007).** In relation to working condition, the results revealed that (88.3%) of nurses had nursing experience more than 6 years. While ICU experience (33.3%) of the nurses were ranged between (4-6) years. These results agreed with **Kotzer *et al.,* (2006),** they stated that nurses worked on their unit less than 6 years. **Clawson & Haskins (2006),** commented that there is evidence that the more experienced expert nurse is able to grasp the intricacies of clinical situation rapidly and can sort out relevant from irrelevant information.

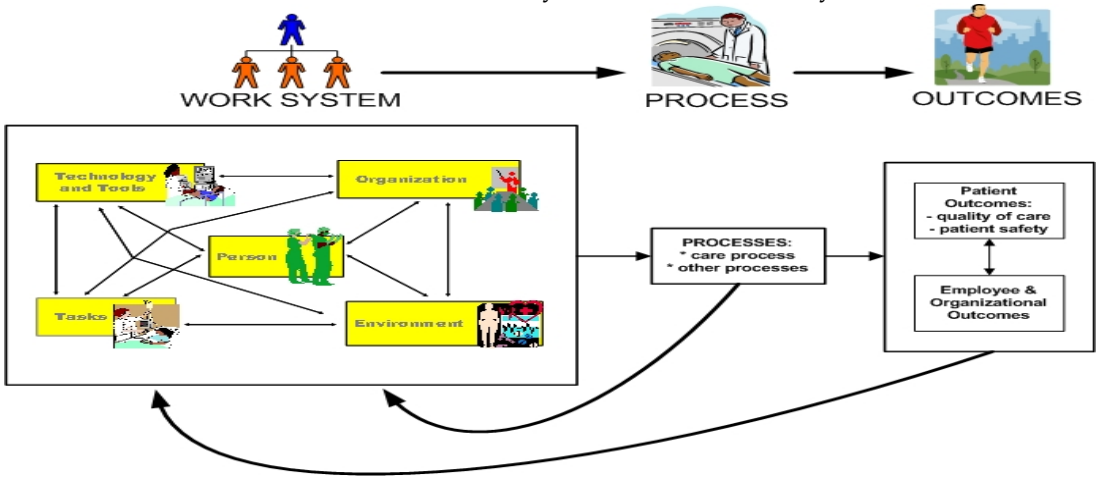
The study showed that the majority of the nurses were working 8 hours in ICU. This result agreed with **Bellebaum (2008)** who stated that 38% of the nurses recalled making at least one error during the two month study period. When nurses worked greater than 12.5 consecutive hours, the risk of that nurse making an error almost doubled compared to nurses who worked 8.5 consecutive hours or less. Among healthcare professionals, fatigue has been found to increase over the duration of a shift, regardless of the length of it. In nurses specifically, an extended workday of nine hours led to greater fatigue and a greater number of health complaints in nurses compared to an 8-hour shift. Nurses also reported that the quality of their work

suffered with the introduction of 9-hours shifts to their workday **(Josten *et al.,* 2003).** As regard favorable work time (61.7%) of the nurses choose the morning shift in ICU. This result congruent with **Costa *et al.,* (2004); Costa *et al.,* (2005)**, they found that shift workers to report lower work ability compared to day workers, with increased discrepancies occurring with age. **Camerino *et al.,* (2008)** that described the nursing staff may suffer from a lack of voluntary choice of the type of shift scheme they can work, but it may be also that they are not offered adequate incentives for their night duties. **Dorrian *et al.,* (2006)** added that the nurses on night shifts have reported high levels of stress, physical exhaustion, and mental exhaustion. Fatigue has deleterious effects on all types of performance. **Ellis (2008)** added that shift work can result fatigue has negative effects on alertness, vigilance, concentration, judgment, mood, and performance. Additionally, **Rogers *et al.,* (2004)** added that scheduled shifts for nurses studied were designated as 8, 12, and sometimes 16 hours long. Although, in their study they referred to these as 8.5, 12.5, and 16.5 hours shifts because each required a "hand-over" time. **JNA (2010)** illustrated that working hours that reach a dangerous level does not only mean working in rotating shifts but also working more than 60 hours overtime. Such a workload level was pointed out by the court as harsh working conditions leading to karoshi (death from overwork). The introduction of flexible working styles aims to allow nursing professionals to combine work with life and continue their career. Examples: One can choose the working hours. ;One can choose the time zone. ; One can choose whether to work in rotational shifts or not. So, **Admi *et al.,*(2008)** recommended that design of the shift work system, such as length of shift (8-12 hours); principles of rotation (day, night, evening); scheduling (clockwise, number of shifts); and adjustment to individual needs ("morning people" vs. "night people")

The study reflect that (65%) of the nurses were responsible to give nursing care for more than 5 patients in ICU. While, (48.3%) of them had only one assistant nurse to help them in nursing care. **Aiken (2003)** reported that three major sources of job dissatisfaction that intuitively have an adverse affect on perceived work pressure: increased patient assignments, too few registered nurses for quality care, and inadequate support services. Further investigation into these factors may lead to interventions that offer an improvement in this dimension of the work environment. Also, the study revealed that (45%) of the nurses' experience with numbers of patients' admissions daily in ICU was more than 5 patients. (48.3%) of them experience with numbers daily patients transfer out of the ICU was (2-4)pts. These results agreed by **Gurses and Carayon (2007**) showed that intra hospital transport for ICU patients need to be transferred to other units of the hospital for tests and procedures and are at high risk en route. Furthermore, accompanying a patient for intra hospital transportation increases the workload of nurses considerably and takes them away from other patients staying in the ICU.

The results of this study indicated that critical care nurses experience in a wide variety of performance obstacles that *cover all elements of the work system model*. It Focusing on performance obstacles represent the following elements of the work system: environment (6 obstacles), organization (7 obstacles), technologies or tools (4 obstacles), and task (4 obstacles). These results congruent by **Gurses and Carayon (2007**).

SEIPS Model of Work System and Patient Safety




*Carayon et al., 2006*

**Family-Related Issues as Performance Obstacles**

Several family-related issues were identified as performance obstacles by critical care nurses. Depending the family-related issues were either categorized in the task element of the work system (e.g., spending time dealing with family needs or teaching family) or in the environment element (e.g., distractions from family members and many phone calls from family).The results illustrated that nurses were receiving many phone calls from patients (33.4%), distractions from family members (31.7%) receiving many phones calls from family members(25%),Work environment, (28.3%) Spending a considerable amount of time teaching my patient(s) or family members(66.6%), Spending time dealing with family needs(50%) (Environment).These results agreed with **Gurses and Carayon (2007**) reported that noisy work environment (46%), distractions from families (42%), receiving many phone calls from families (23%). It has been reported previously that nurses may view getting involved in some of the family-related issues as problems or barriers to their job. ICU nurses reported high workload and their limited training in dealing with some of the family situations as factors that affect nurse-family relations adversely**.** They suggested that ICU nurses may view families as obstacles due to inadequate staffing in the unit as evidenced by a quote from an ICU nurse. **Soderstrom *et al.*, (2006)** revealed that some nurses consider medical and technical tasks as their main focus and express not having enough time for families**. Gross (2006)** added that dealing with angry and distraught family members, continually calling nurses for an update on patient's status, and no social workers to help with communication with families were identified as obstacles experienced by ICU nurses providing end-of-life care. Also, She reported here provides additional support for the strong need to improve nurse-family relations in ICUs and to make families an integrated part of patient care in ICUs.

**Communication between critical care Nurses and Other Providers**

Two different issues related to nurse-physician communication were identified as performance obstacles by critical care nurses inadequate information from physicians (21.7%) and delay in seeing new medical orders for my patient(s) (20%). These results agreed with **Gurses and Carayon (2007)** described that all the ICUs involved in the study were using, at least partially, paper based patient charts. When a physician writes an order for a patient, nurses often learn about the order by looking at the chart. In an ICU, there are different care providers who need the patient chart from time to time to provide appropriate care; therefore, getting the chart in a timely manner can become a challenge for nurses. It could take 2 to 3 hours before the nurse could get the chart and become aware of a new order written for the patient. A delay of 3 hours in starting a new treatment may have a significant effect on ICU patients. According, **Tammelleo (2001)** revealed that nurses may not get the information they need from physicians during both the day and night shifts. During the day shift, physicians may not be available immediately to respond to nurses' questions because they face other demands such as being in surgery or attending meetings. Even if they are available, they may forget or unintentionally omit to communicate important information to nurses due to their high workload. During the night shift, the cross-covering physician may not have adequate knowledge of the patient to be able to answer nurses' questions. Ineffective communication between nurses and physicians has been linked to medication errors, patient injuries, and patient deaths. **Narasimhan *et al.*, (2006); Gurses & Xiao (2006)** suggested that methods should be explored for improving nurse-physician communication such as developing and using new information tools for multidisciplinary rounds such as a daily goals worksheet by ensuring clarity of what is discussed and by preventing physicians from forgetting to discuss an issue important for patient care.

The results of the study showed that performance obstacles reported by critical care nurses was related to organization element such as change of shift report(s) took longer than they should and inadequate information given to me by the previous shift's nurse(s) during the shift change (25%). These results congruent by **Currie (2002)** conducted in non-ICU environments, missing information (omission of critical information regarding a patient or the omission of an entire report of a patient) was identified as one of the major problems with shift change report. Furthermore, if designed well, information technology has a great potential to improve inter provider communication, including shift change report **(Gurses & Xiao, 2006).**

**The Physical Environment**

The results of the study revealed performance obstacles reported by critical care nurses was related to environment element such as experience with insufficient work place for completing paper work (40%), patients' room full with visitors (36.7%). These results agreed with **Gurses and Carayon (2007)** emphasized that importance of the physical environment in ICU nurses' work. **Tyson *et al.*, (2002)** added that nurses viewed the increased private space in the new units as positive for patients. However, the increased space led to feelings of isolation among nurses and increased nurse burnout, as observing patients and interacting with coworkers became more difficult**. Smith *et al.*,(2005)** stated that the redesign of

a neonatal ICU from an open bay design to a private room design led to significant improvements in the quality of the physical environment as reported by neonatal ICU nurses, but to a deterioration in the quality of patient care team interaction. Specific improvements in the physical environment were related to increased staff privacy, parental privacy and thermal comfort, and decreased noise. **(Patterson et al., 2004)** added that the work environment, or organizational climate, is generally understood to influence the behavior of employees**.** Social exchange theory suggests that when an organization values and supports its employees, the employees feel obligated to reciprocate **(Dawley et al., 2008).**Thus, employees who perceive a positive work environment feel positive toward the organization. These feelings can lead to outcomes such as increased commitment and performance, and extra-role behaviors **Aryee *et al.,* (2002).**

Regarding performance obstacles reported by critical care nurses was related to technologies or tools element such as the isolation rooms were not well stocked (60%), the central stock area was not well-stocked (25%), having to use equipment that was in poor condition (21.7%). waiting to use a piece of equipment because someone else was using it. (20%). These results congruent by **Janakiraman *et al.,* (2011)** focused on three aspects of the physical environment that are of particular importance to nurses: quality of patient areas, safety, and quality of work spaces. Quality of patient areas refers to the comfort and privacy afforded patients and families due to the physical design of the area in which they spend time. Given the hospital setting, the authors focused on the patient rooms. Safety is a basic need that takes on added prominence in work roles that are inherently dangerous. Safety is defined as the degree of hazard for staff and patients related to facility design. Quality of work spaces refers to convenient access to needed supplies, storage, parking, meeting space, and equipment, and a workstation with the features needed for the job. They found that the perceived safety of the physical environment is associated with perceived service quality. **Kotzer *et al.,* (2006)** added that physical features that afford comfort and privacy can benefit both the patient and the caregiver. Nurses may benefit not only because they spend considerable time in these spaces but also because it is easier to serve patients and families who are pleased with the facility. The authors asked the nurses about a wide range of features related to their work space (for example, storage for supplies) and found that these design elements significantly impact their perceptions of service quality and their commitment. Nurses benefit from well-designed work areas that meet their needs and enhance their ability to accomplish their work..

The ICU work system needs to be redesigned to reduce nursing workload and improve QWL as well as patient safety and quality of care **(Institute of Medicine, 2004).** The first step in redesigning a healthcare work system is to determine where to focus efforts, which can be accomplished by identifying the performance obstacles in the work system **(Carayon *et al.,* 2005). Miller (2006)** stated that organizational or work-role competencies that include co-ordination, prioritization and management of multiple responsibilities. A supportive work environment may also contribute to quality of care, morale among staff, and successful recruitment and retention.

Regarding performance obstacles reported by critical care nurses were related to task element for responsibility about orientation for new nurses was (100%). According this result, **Donna (2002)** illustrated that many companies feel that orientation is a function of their Human Resources or Administrative department that involves completing the paperwork for payroll and benefits packages. Other times the new employee is hurriedly introduced and passed on to a fellow employee who has been assigned to "show you the job". Because they usually remain accountable for their primary responsibilities during this time, they often end up demonstrating the "quick version" and leave the new employee with the remark "Let me know if you have any questions or problems." **Roberts *et al,* (2004)** found that new nurses were more likely to stay in their current position if they were satisfied with aspects of the work environment, including co-workers, interaction, professional opportunities and recognition. **O' neil ( 2008)** added that people work better and achieve more when they are clear on the organization's mission, strategic directions and are aligned around shared values.

Another performance obstacle reported by critical care nurses was related to intra hospital patient transport (33.4%). This result agreed by **Gurses & Carayon (2007)** stated that ICU patients need to be transferred to other units of the hospital for tests and procedures and are at high risk en route. Furthermore, accompanying a patient for intra hospital transportation increases the workload of nurses considerably and takes them away from other patients staying in the ICU.

Regarding performance obstacles reported by critical care nurses was related to help from Nursing Assistants, Help from Other Nurses, Help from Unit clerk, work environment (56.7%, 76.7%, 55%, and 28.3%) respectively with statistically significant difference. **Roberts *et al.,* (2004)** stated that entering professional nurses described the difficulties they encountered in being able to offer the type of care they believe patients deserve. They cited the nurse shortage, demands on time, conflicting values and lack of autonomy as major obstacles to good work in nursing.

Demands on time involved the need to perform multiple tasks with fewer resources, such as supplies or assisting staff. **Wolfe (2012)** added that a good ward clerk should be able to work efficiently amidst a very fast-paced working environment. They should be able to effectively follow the hospital's record-keeping systems and procedures. They should also have the presence of mind to give assistance when necessary. Customer service in hospitals can vary greatly in quality. While some hospitals provide low wait times, friendly staff and professional, unhurried physicians, other hospitals do not have the means or will to provide such attentive care. The reasons a health care facility would deliver poor customer service can vary widely. **Gurses (2005)** stated that the distance between the patients' rooms assigned to a nurse affects physical workload; the condition of the work environment (noisy versus quiet, hectic versus calm) affects the overall effort spent by the nurse to perform her job**.**

## Conclusion

Performance obstacles represent the following elements of the work system: environment (6 obstacles), organization (7 obstacles), technologies or tools (4 obstacles), and task (4 obstacles).The results of this study indicate that critical care nurses' experience a wide variety of performance obstacles that cover all elements of the work system model

Performance obstacle reported by critical care nurses was related to Help from Nursing Assistants, Help from Other Nurses, Help from Unit clerk, work environment were statistically significant difference.

## Recommendation

- The proposed strategy is focused on a few obstacles that are relatively easy to change, and do not require a large amount of resources. For example, performance obstacles related to misplacement of equipment, supplies, and patient charts may be easier to eliminate than problems related to inadequate workspace. Whereas performance obstacles related to misplacement of equipment, supplies, and patient charts may be eliminated by creating and reinforcing a protocol or by establishing a tracking system, the performance obstacle of inadequate workspace may require a major redesign of the physical layout of the ICU.
- Future research should investigate the impact of various performance obstacles on nursing workload, nursing quality of working life, and quality and safety of care, as well as the impact of interventions aimed at redesigning the work system of critical care nurses to remove performance obstacles.
- Organizations can use the findings as a blueprint to improve work environments and increase retention of critical care nurses.

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