

The Relation between Fatigue Level and Nurses' Caring Behavior in The Orthopedic Department

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ABSTRACT

Contents: Caring is a concept that is inherently difficult to define. The term caring is expressed in different ways in many cultures. Nurse's caring can impact a person's life processes, wellbeing, and functioning. On the other hand, fatigue is a subjective unpleasant feeling ranging from tiredness to exhaustion that could be physical, mental, or both. It may significantly interfere with functioning and may persist despite periods of rest.

Aim: The present study investigates the relation between fatigue level and nurses' caring behavior in the orthopedic department.

Methods: Research formulates three questions. What is the nurses' level of fatigue in the orthopedic department? What are the nurses' caring behaviors in the orthopedic department? What is the relation between fatigue level and nurses' caring behavior in the orthopedic department? The study utilized a correlational research design. The study conducted in El Hadra Orthopedic and Traumatology University Hospital, Alexandria, Egypt, on all available nurses (50 nurses) who provide direct patient care and work in the previously mentioned setting. Two tools were used for data collection. Structured interview questionnaire; It consists of two parts. The first part was concerned with socio-demographic data, past medical history of psychological problems, and chronic illness. The second part was Fatigue Visual Analog Scale (VAS), a one-dimensional scale, consisting of an unmarked 10 cm line to rate the nurses' level of fatigue. The second tool was the Orthopedic Nurse Caring Behavior Observation Checklist. This tool was used to assess nurses' caring behavior toward orthopedic patients through concealed observation.

Results: It was observed that 60.0% of studied nurses had a severe level of fatigue. The study showed a moderate level of caring behaviors with a mean of 199.92±13.50 for the morning shift nurses and 222.34±14.27 for the nurses in the evening shift. The study evidenced a significant correlation between fatigue level and overall caring behavior.

Conclusion: About two-thirds of the studied nurses had a severe level of fatigue. The overall nurses' caring behaviors dimensions were of a moderate degree. There is a significant positive correlation between fatigue level and the overall nurses' caring behaviors in both morning and evening shifts in the orthopedic department. The study recommended to provide nurses with fatigue countermeasure strategies and to provide the organization with strategies to overcome fatigue. Nurses are recommended to pay more attention to caring behaviors.

Keywords: Fatigue, nurses, caring behavior, orthopedic department

1. Introduction

Caring is the cornerstone of nursing practice, and nursing as a profession places a high value on it (Amendolair, 2012). Nurse caring focuses on actions and activities directed toward assisting, supporting, or enabling another individual or group with evident or anticipated needs, improving a human condition or life way, even face death (Nunnery, 2016).

Nurse's caring can impact upon a person's life processes, wellbeing, and functioning. Caring has two key dimensions: Physical and expressive. The physical dimension includes medication administration, provision of relaxed surroundings, giving advice, and providing hygiene. While expressive caring dimension refers to activities as being with the patient, maintaining patient privacy, providing emotional support, be an excellent listener to the patient, and being sensitive to the patient's

needs (Labrague, McEnroe-Petite, Papathanasiou, Edet, & Arulappan, 2015; Petrou et al., 2017).

According to Watson's theory, nursing behaviors that are related to nursing caring include humanism, faith-hope, sensitivity, helping relationship, expression of emotions, problem-solving, human needs assistance, teaching, corrective environment, and existential spiritual forces (Watson, 2002).

The orthopedic nurse's role in preparing surgical patients preoperatively, besides supporting and caring for them postoperatively, is paramount. The orthopedic nurse has different areas of perioperative care that include performing a neurovascular assessment, nutritional preparation encourages smoking cessation, encourages the performance of the exercise, and provides psychological support to the patients (Ahmed, Sleem, & Kassem, 2015).

Today's nurses in general and orthopedic nurses in particular face a variety of challenges and responsibilities regarding meeting the physical and psychological needs of

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patients. When these responsibilities are performed in lousy working condition such as limited resources whether in staffing, or supplies and equipment, prolonged working hours and insufficient recovery time, lack of breaks to eat or drink, feeling the pressure, lack of motivation; all of these might contribute to fatigue, and influence nurses' caring behavior (Keers, Williams, Cooke, & Ashcroft, 2013; Salimi, & Azimpour, 2013; Patterson, Weaver, & Hostler, 2015).

Fatigue is a subjective unpleasant feeling ranging from tiredness to exhaustion that can be physical, mental, or both. It may significantly interfere with functioning and may persist despite periods of rest. Work-related fatigue affects higher than half of the emergency medical services personnel (Canadian Nurses Association, 2010; Motamedzade et al., 2017). Fatigue resulting from poor working conditions may lead to disruptive behavior in the workplace, decrease in empathy, and patient-centered communication.

Moreover, fatigue decreases nursing job satisfaction and clinical decision regret, which can negatively impact patient care. Besides, it negatively impacts on nurse's safety, such as needle-stick injuries, and the improper donning and taking off of personal protective equipment (Bakotic & Babic, 2013; Barker & Nussbaum, 2011). The effects of fatigue on performance are manifested in decreased alertness, slowed reaction time, low concentration, slowed information processing, irritability, poor judgment, changes in mood, and diminished motivation. As caring can be extensively affected by environmental factors and fluctuate from area to place, there is a need to clarify fatigue as determinants of caring behaviors in an orthopedic setting (Blasdell, 2017).

2. Significance of the study

Caring behavior is one of the fundamental missions of nurses that each person of society requires at some point in his life. Caring behavior is the chief responsibility of nurses before everyone else. In Egypt, there are several studies conducted to assess nurses' caring behaviors Amro (2010) reported in a study about "assessment of nurses' caring behaviors and abilities in the cardiac department" that the nurses' caring behaviors and abilities in caring for cardiac patients was not done satisfactory, where the majority of them have a low score. Amro's study also reported that nurses' caring behaviors related to "environment," "needs," and "humanism" was the highest score among all caring behavior subscales, while the lowest score was for "teaching," "spirituality," and "problem-solving" subscales respectively.

Another study has compared fatigue-related outcomes in nurses, Ahmed, Sleem, and Kassem (2015), who reported that staff nurses' performance was affected by the degree of working conditions and fatigue levels. However, we did not come across any study that evaluated the relationship between fatigue level and nurses' caring behavior in the orthopedic department. Evidence in this area is critically lacking. Therefore, the study aims to investigate the relation

between fatigue level and nurses' caring behavior in the orthopedic department.

3. Aim of the study

The study aims to investigate the relation between fatigue level and nurses' caring behavior in the orthopedic department.

3.1. Research questions

- What is the nurses' level of fatigue in the orthopedic department?
- What is the nurses' level of caring behaviors in the orthopedic department?
- What is the relation between fatigue level and nurses' caring behaviors in the orthopedic department?

4. Subjects and Methods

4.1. Research design

A correlational research design was used in this study. Creswell and John (2014) stated that a correlational research design is a type of non-experimental research method, in which a researcher measures two variables, understands and assesses the statistical relationship between them with no influence from any extraneous variable.

4.2. Research setting

The study was conducted at El Hadra Orthopedic and Traumatology University Hospital, Alexandria, Egypt. It consisted of three sections. Each section contained 40 beds.

4.3. Subjects

All available nurses (50 nurses who provide direct patient care) after the exclusion of 5 nurses for the pilot study.

4.4. Tools of the study

In order to fulfill the objectives of the current study, two tools were used for data collection.

4.4.1. Structured Interview Questionnaire

The researchers developed this tool after reviewing the related literature Keers, Williams, Cooke, and Ashcroft, (2013); Salimi and Azimpour, (2013); Patterson, Weaver, and Hostler, (2015); Canadian Nurses Association, (2010); Motamedzade et al. (2017); Bakotic and Babic, (2013); Barker and Nussbaum (2011). It consists of two parts:

The first part was intended to obtain information about the socio-demographic characteristics of the study subjects. It included: age, gender, marital status, educational level, years of experience, working hours per week, and numbers of family those nurses care for them (their children and parents).

This part also included the past medical history of psychological problems, presence of chronic illness, medication (medication used for the treatment of nurses' chronic diseases), the time spent in the distance between the hospital and home by minutes (it shows fatigue of nurses in reaching hospital). In addition to lifestyle assessment that

included smoking, nutritional habits, intake of vegetables and fruits, fluid intake per day, caffeine consumption, the performance of the physical activity, and fixed sleeping time and sleeping hours.

The second part of this questionnaire is a Fatigue Visual Analog Scale (FVAS) (Hewlett, Dures, & Almeida, 2011). The Fatigue Visual Analog Scale (FVAS) is one-dimensional consist of an unmarked 10 cm line, where 0 refers to no fatigue and 10 cm referring to the higher intensity of fatigue. Nurses were asked to rate their level of fatigue during working hours.

Scoring system

- 0 to less than 1 indicated no fatigue.
- From 1 to less than 3 indicated mild fatigue.
- From 3 to less than 6 indicated moderate fatigue.
- From 6 to 9 indicated severe fatigue.
- 10 indicated very severe fatigue.

4.4.2. Orthopedic Nurse Caring Behavior Observation Checklist

This tool was adapted from Amro (2010). It was used to measure nurses' caring behavior for orthopedic patients through concealed observation. The tool represented verbal and non-verbal caring behaviors level for orthopedic patients. It considered the physical, psychological, social, and spiritual aspects of nursing care, which was congruent with the holistic nursing care model.

It consists of 104 statements categorized in 8 subscales of caring behaviors (the original tool consists of 131 statements categorized in 8 subscales). They were humanism (14 statements). It includes such statements as use the patient's name and considers age; respect patient privacy, and allow enough time to prevent rushing. Helping relationships (16 statements) such as assess lifestyle so that genuine relationships can be established; listen to the patient attentively; and give a quick response to the patient's calls.

Expression of emotions (12 statements) includes providing a caring touch and eye to eye contact; believe and show awareness of patient subjective feelings as pain, and observe the patient's nonverbal cues. Problem-solving (9 statements) that include statements such as assisting in establishing realistic short and long-term goals and desired outcomes; help the patient to find a coping strategy appropriate to his or her personality; and identify closest emotionally person to the patient who can offer support, e.g., in decision making, and informed consent.

Teaching (17 statements) included assessing the patient's level of understanding and readiness to learn; teach patients in an understandable language, and identify what is essential to know about disease and treatment. Environment (6 statements) such as ensures a clean environment, prevents noise, creates a quiet environment conducive to sleep, alleviates fear. Besides, regulate visiting time according to patient condition. Before leaving, check if the patient has everything he needs and help the patient to clarify which things he would like the significant person to bring him.

Needs (21 statements) include staying with the patient until the symptom is relieved. Nurses administer medications regimen as prescribed and consider the ten rights. Spirituality (9 statements), such as encourage spiritual practices like prayer and meditation, helping the patient to find the motivation to improve the state of health and offer Quran and religion sounds meditation.

Scoring system

Scoring system was varying between done satisfactory to not do as the following:

- (DS) which means done satisfactorily=3
- (DU) which means done unsatisfactorily=2
- (ND) which means not done =1

The higher score indicating a greater degree of caring behavior. Each subscale was scored as follows:

"Humanism" subscale has (14 statements); the possible range of scoring is from 14 to 42. "Helping relationship" subscale has (16 statements), with a possible range of scores from 16 to 48. The subscale "Expression of emotions" has (12 statements), with a possible range of scores from 12 to 36.

The subscale "Problem solving" has (9 statements), with a possible range of scores from 9 to 27. The subscale "Teaching" has (17 statements); the possible range of scoring is from 17 to 51. The subscale "Environment" has (6 statements) with a possible range of scoring is from 6 to 18. The subscale "Needs" has (21 statements) with a possible range of scoring is from 21 to 63. The subscale "Spirituality" has (9 statements), with a possible range of scores from 9 to 27.

Scoring system for each subscale

Each subscale was scored, summed and classified as $\geq 75\%$ was considered high, $50 < 75\%$ was considered moderate, and less than 50% was considered low according to the following

- The high degree of "humanism" subscale ≥ 31.50 , a moderate degree from 21 to < 31.50 , and low degree = < 21 .
- The high degree of "Helping relationship" subscale ≥ 36 , a moderate degree from 24 to < 36 , and a low degree < 24 .
- The high degree of "Expression of emotions" subscale ≥ 27 , a moderate degree from 18 to < 27 , and a low degree < 18 .
- The high degree of "Problem-solving" subscale ≥ 20.25 , a moderate degree from 13.50 to < 20.25 , and a low degree < 13.50 .
- The high degree of "Teaching" subscale ≥ 38.25 , a moderate degree from 25.50 to < 38.25 , low degree < 25.50 .
- The high degree of "Environment" subscale ≥ 13.50 , a moderate degree from 9 to < 13.50 , and a low degree < 9 .
- The high degree of "Needs" subscale ≥ 47.25 , a moderate degree = from 31.50 to < 47.25 , and a low degree < 31.50 .
- The high degree of "Spirituality" subscale ≥ 20.25 , a moderate degree from 13.50 to < 20.25 , and a low degree < 13.50 .

The overall total caring behavior score is a composite of the eight subscales statements; its scores ranged from 104 to 312. Classification into high, medium, and low as

the following:

- The high degree of caring behavior = $\geq 75\%$ of the maximum score for the statements. It equals the score ≥ 234 .
- A moderate degree of caring behavior = 50% to $< 75\%$ of the maximum score for the statements. It equals the score from 156 to < 234
- Low degree of caring behavior = $< 50\%$ of the maximum score for the statements. It equals a score of < 156 .

4.5. Procedures

Official approval was obtained from the hospital director after an explanation of the aim of the study. Development of tool I by the researchers based on relevant recent literature. Tool II was adapted from Amro (2010). Both tools were tested for the content validity, completeness, and clarity of its items by five experts in the Medical-Surgical Nursing field, Alexandria University. Consequently, the necessary modifications were made.

Reliability for the tool I "Structured Interview Questionnaire" was tested after translation into Arabic and back-translation through using Cronbach's Alpha method. Reliability value was ($r=0.824$). The reliability of Tool II "Orthopedic Nurse Caring Behavior Observation Checklist" was tested statistically by Cronbach's Alpha test; the reliability coefficient of the tool indicated a positive correlation ($r = 0.70$).

A pilot study was carried out before starting the data collection on 10% (5 nurses) of the study subjects to test the applicability and feasibility of the research process. Data obtained from the pilot study were excluded from the actual study.

Every nurse interviewed individually by the researchers to collect the needed data using tool I. Each interview lasted about 20-30 minutes. The concealed continuous observation was done using tool II. The researcher observed each nurse two times in two different shifts (morning and evening). Night shifts were excluded because fewer interventions performed. Data collection was carried out over a period of six months (from November 1, 2018, to April 30, 2019).

Ethical Considerations: Written approval was obtained from nurses after an explanation of the aim of the study. Confidentiality was ascertained. Privacy was assured for all participants, as nurses' names were written electively. Nurses were informed that their participation is voluntary, and they have the right to withdraw from the study with full respect.

4.6. Data Analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. Quantitative data were described using the number and percentage. One-way analysis of variance (abbreviated one-way ANOVA) is a technique used to compare means of two or more samples (using the F distribution). This technique can be used only for data. The significance of the obtained results was

judged at the 5% level. The observed differences and associations were considered as the following:

- Significant (S) $p \leq 0.05$.
- Highly Significant (HS) $P < 0.001$.
- Non-significant (NS) $p > 0.05$.

5. Results

Table 1 shows the distribution of the studied nurses according to their socio-demographic characteristics. Concerning age, it was observed an equal percentage of nurses (42%) in the age groups of 30- < 40 , and 40- < 50 . 100% of nurses were females, the majority (94%) were married, 60% had technical institute diploma in nursing, and a half (52%) had more than ten years of experience. More than three quarters (80.0%) of studied nurses worked more than 40 hours per week. 72% of the nurses had 3-4 persons to care for them per day.

Table 2 clarifies that 72.0% of nurses did not have a past medical history of psychological problems nor chronic illness, and around three quarters had near (< 60 minutes) distance between the hospital and home.

Table 3 exhibits that; all studied nurses were nonsmokers, 70.0% had irregular diet, near half (48%) had an intake of vegetables and fruits once per week, more than half of them (56% and 52%) took 2-3 liters of fluids per day, and did not have caffeine consumption respectively, 60.0% did not perform any physical activity, and 46% of studied nurses had fixed sleep times with adequate sleep hours.

Figure 1 illustrates the view that 60.0% of studied nurses had a severe level of fatigue, 30.0% had a moderate level of fatigue, and 10.0% had mild fatigue level.

Table 4 demonstrates frequency and percentage distribution according to the humanism dimension of caring during the morning and evening shifts. It was noticed that near half of studied nurses' did not answer questions honestly, puts the patient first, and consider the patient as a complete individual, shows interest in more than his health problem during morning and evening shift while 82.0% of them respected the patient privacy and be patient even with difficult patients during the morning shift.

Table 5 exemplifies the frequency and percentage distribution of the studied nurses' according to helping relationship dimension of caring behaviors during the morning and evening shift. It was found that all studied nurses did not introduce themselves by stating clearly their name and position (morning), asking the patient what name be preferred to be called, asking the patient how the night, the day was; assess lifestyle so that genuine relationship can be established.

The table also shows that most of the nurses doing satisfactorily the behaviors of listening to the patient attentively 46%, 82%, encourage patient as says "you are doing well" 50%, 86%, check on patient frequently 46%, 88%, explain the procedure before initiation as "clotting time, ECG, vital signs" 54%, 94%, or verbalize and reassure patient during care 46%, 90% during both morning and evening shifts.

Table 6 illustrates the frequency and percentage distribution of the studied nurses' according to their expression of emotions dimension of caring behaviors during morning and evening shifts. It was found that all studied nurses did not continue to be interested in the patient, even though a crisis or critical phase has passed in evening shift nor introduce statement to which the patient discusses feeling as pain, fear of death, anger during the morning shift and more than two-thirds done it unsatisfactorily in the evening shift.

Table 7 displays the frequency and percentage distribution of the studied nurses according to the problem-solving dimension of caring behaviors during morning and evening shifts. It was found that all studied nurses did not plan a strategy to modify the type of behavior (in the morning shift), assist in establishing realistic short- and long-term goals and desired outcomes. They help the patient to find a coping strategy appropriate to his or her personality (morning and evening shift) or help the patient to see things from a different point of view (in the morning shift). All nurses did not ensure that the patient understands his illness and how he or she can assist in recovery (in the evening shift)

Table 8 shows the frequency and percentage distribution of the studied nurses according to the teaching dimension of caring behaviors during morning and evening shifts. It was found that all studied nurses did not assess the patient's level of understanding and readiness to learn. Also, they did not assess the patient's level of information regarding disease and treatment nor teach the patient in an understandable language, which is important to know about disease and treatment. Besides, they copy of treatment plans or records to be given to patients in language that he can understand, explain all expected equipment before they use, and include relatives in any teaching program provided for the patient (in morning and evening shift). However, 50% of them advised dissatisfaction with "what next" what can and cannot do when getting home as using stairs.

Table 9 presents the frequency and percentage distribution of the studied nurses according to the "environment" dimension of caring behaviors during morning and evening shifts. It was found that more than half of the studied nurses were prevented noise: creates a quiet environment conducive to sleep, alleviates fear unsatisfactorily in the morning shift, and satisfactorily in the evening shift. They ensured clean environment 66%, 76%, regulate visiting time according to patient condition 92%, 92%, before leaving check if the patient has everything he needs 60%, 64%, and help the patient to clarify which things he would like the significant person to bring him 52%, 60 during morning and evening shift.

Table 10 shows the frequency and percentage distribution of the studied nurses' according to needs dimension of caring behaviors during morning and evening

shifts. It was noticed that most of the studied nurses check vital signs as respiratory rate and depth. All studied nurses did not check food from the kitchen, observe tray pre and post-meal, observe a healthy diet, obtain daily weight, observe sleeping hours by the day or night, offer the patient back rub, or ask the patient if he feels comfort (in morning and evening shifts). While a high percentage (88%) know how to give the treatment, 84%, 86% consider the ten right of medications, 84%, 86% support the unable patient in taking medications in morning and evening shifts.

Table 11 reveals the frequency and distribution of the studied nurses according to the spiritual dimension of caring behaviors during morning and evening shifts. It was noticed that all studied nurses did not help the patient to explore the meaning that he gives to his health condition or assess the need of a spiritual counselor. At the same time, less than half of them encouraged the patient to have confidence in himself (40%, 48%), and draw patient attention to positive aspects concerning him and his state of health (32%, 44%), and helps the patient to find the motivation to improve his state of health (40%, 50%) during even morning and evening shifts.

Table 12 shows a descriptive analysis of the studied nurses' subtotal and total caring behaviors' dimensions during morning and evening shifts. Humanism shows a means score of (28.24± 7.06 & 30.62± 8.52), helping relationship (36.92±3.94 & 37.18±2.83), expression of emotion (22.82±4.06 & 27.40±4.35) and problem-solving (14.36±2.32 & 18.40±2.24) in both morning and evening shifts respectively. The subtotal score relating to nurses' caring behavior's dimensions, teaching (22.02 ± 2.83 & 27.28 ± 3.50), environment (12.98 ± 2.17 & 15.92 ± 2.43), needs (48.36± 8.04 & 47.96± 6.89) and spirituality (14.22 ± 5.07 & 15.58 ± 5.01) in both morning and evening shifts respectively. The total caring behaviors, mean score of 199.92±13.50, and 222.34±14.27 for the morning and evening shift, were moderate caring behaviors (according to the scale scoring system).

Table 13 shows a significant positive correlation between fatigue level and nurses' caring behaviors dimensions: humanism, problem-solving, teaching, and environment ($p= 0.001, 0.001, 0.001, \text{ and } 0.044$) in the morning shift. Also, there is a significant correlation between fatigue level and overall caring behaviors in the morning shift ($p= <0.001$).

Table 14 shows a significant positive correlation between fatigue level and nurses' caring behaviors dimensions: humanism, helping relationship, expression of emotions, problem-solving, teaching, and environment ($p= 0.001, 0.016, 0.003, 0.001, 0.001, \text{ and } 0.004$) in the evening shift. Also, there is a significant correlation between fatigue level and overall caring behaviors in the evening shift ($p= <0.001$).

Table (1): Frequency and percentage distribution of the studied nurses according to their socio-demographic characteristics (n=50).

Socio-demographic characteristics	No.	%
Age		
20-<30	8	16.0
30-<40	21	42.0
40-<50	21	42.0
50-≥60	0	0.0
Gender		
Male	0	0.0
Female	50	100.0
Marital Status		
Single	2	4.0
Married	47	94.0
Widow	1	2.0
Educational level		
Secondary school diploma	20	40.0
Technical institute diploma	30	60.0
Bachelor degree	0	0.0
Master degree	0	0.0
Doctorate degree	0	0.0
Experience in years		
Less than 5	8	16.0
5 – 10	16	32.0
More than 10	26	52.0
Working hours per week		
< 40 hours	10	20.0
≥ 40 hours	40	80.0
Number of family members the nurse care for them (children, parents)		
1-2	10	20.0
3-4	36	72.0
4-5	4	8.0

Table (2): Frequency and percentage distribution of the studied nurses according to their clinical data (n = 50).

Nurses' clinical variables	No.	%
A past medical history of psychological problems		
Yes	14	28.0
No	36	72.0
Chronic illness		
None	36	72.0
Diabetes	2	4.0
Hypertension	4	8.0
Ischemic heart	2	4.0
Hypothyroidism	0	0.0
Anemia	3	6.0
Asthma	0	0.0
Rheumatoid arthritis	3	6.0
Medication (medication used for the treatment of nurses' chronic diseases)		
None	36	72.0
Hypoglycemic	0	0
Antihistamine	8	16.0
Anti-anxiety	6	12.0
Blood pressure medication	0	0.0
The time spent in the distance between the hospital and home by minutes		
Far (≥60 min)	13	26.0
Near (<60 min)	37	74.0

Table (3): Frequency and percentage distribution of the studied nurses according to their lifestyle assessment (n = 50).

Lifestyle assessment	No.	%
Smoking		
Yes	0	0.0
No	50	100.0
Nutritional habits		
Regular diet	15	30.0
Irregular diet	35	70.0
Intake of vegetables and fruits		
Daily intake	11	22.0
Once per week	24	48.0
Three times per week	15	30.0
Fluid intake per day		
Less than 2 liters	20	40.0
2 – 3liters	28	56.0
More than 3 liters	2	4.0
Caffeine consumption		
No	26	52.0
Yes	24	48.0
Performance of the physical activity		
Regular	0	0.0
Not regular	20	40.0
Not perform	30	60.0
Fixed sleep times		
No	0	0.0
Yes	23	46.0
Sometimes	27	54.0
Sleep hours		
Adequate	23	46.0
Not adequate	27	54.0

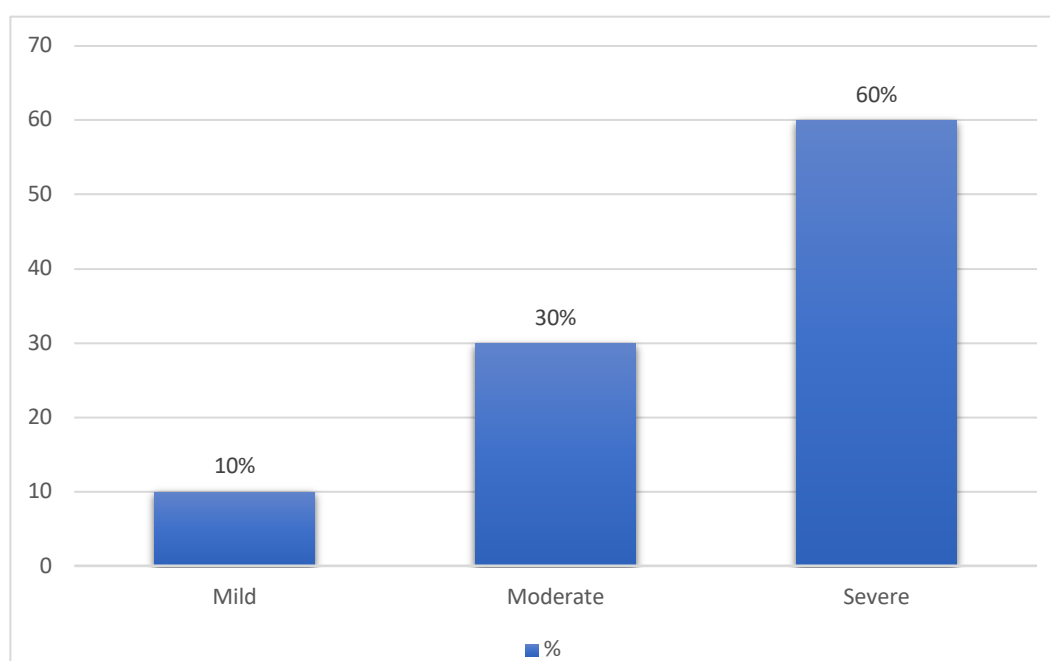
**Figure (1): Percentage distribution of the studied nurses according to their fatigue level (n = 50).**

Table (4): Frequency and percentage distribution of the studied nurses according to the humanism dimension of caring behaviors (n = 50).

Humanism caring behaviors	Morning						Evening					
	Done satisfactory		Done unsatisfactory		Not done		Done satisfactory		Done unsatisfactory		Not done	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Use the patient's name and considers age	34	68.0	9	18.0	7	14.0	34	68.0	9	18.0	7	14.0
Show respect to those closest to patient	29	58.0	10	20.0	11	22.0	16	32.0	14	28.0	20	40.0
Respect patient privacy	41	82.0	4	8.0	5	10.0	41	82.0	4	8.0	5	10.0
Answer questions honestly	14	28.0	15	30.0	21	42.0	16	32.0	15	30.0	19	38.0
Be patient even with difficult patients	41	82.0	4	8.0	5	10.0	14	28.0	15	30.0	21	42.0
Puts the patient first	12	24.0	16	32.0	22	44.0	17	34.0	11	22.0	22	44.0
Try to see things from the patient's point of view	10	20.0	18	36.0	22	44.0	14	28.0	7	14.0	29	58.0
Considers the patient as a complete individual, and shows interest in more than his health problem	14	28.0	12	24.0	24	48.0	13	26.0	13	26.0	24	48.0
Ask the patient how he would like things to be done	9	18.0	8	16.0	33	66.0	16	32.0	15	30.0	19	38.0
Remain until the patient is less apprehensive	10	20.0	15	30.0	25	50.0	27	54.0	7	14.0	16	32.0
Allow enough time to prevent rushing	11	22.0	18	36.0	21	42.0	15	30.0	24	48.0	11	22.0
Has a consistent approach with the patient	23	46.0	10	20.0	17	34.0	21	42.0	21	42.0	8	16.0
Keep those closest to the patient up to date about his state of health "with the patient agreement."	10	20.0	28	56.0	12	24.0	28	56.0	8	16.0	14	28.0
Let the patient know that it is okay to feel anxious and afraid	16	32.0	25	50.0	9	18.0	20	40.0	21	42.0	9	18.0

Table (5): Frequency and percentage distribution of the studied nurses according to their helping relationship dimension of caring behaviors (n = 50).

Helping relationship caring behaviors	Morning						Evening					
	Done satisfactory		Done unsatisfactory		Not done		Done satisfactory		Done unsatisfactory		Not done	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Great the patient (says good morning, evening)	33	66.0	13	26.0	4	8.0	43	86.0	7	14.0	0	0.0
Introduce herself by stating clearly her name and position	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Ask the patient what name he prefers to be called	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Ask the patient how the night, the day was	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Assess lifestyle so that genuine relationship can be established	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Listen to patient attentively when he speaks with appropriate responding	23	46.0	27	54.0	0	0.0	41	82.0	9	18.0	0	0.0
Concentrate only with the patient	20	40.0	30	60.0	0	0.0	31	62.0	19	38.0	0	0.0
Encourage patient as says "you are doing well."	25	50.0	25	50.0	0	0.0	43	86.0	7	14.0	0	0.0
Keep her promise and explain when they are broken	21	42.0	21	42.0	8	16.0	29	58.0	21	42.0	0	0.0
Check on patient frequently	23	46.0	23	46.0	4	8.0	44	88.0	6	12.0	0	0.0
Give quick response to the patient's calls	19	38.0	24	48.0	7	14.0	39	78.0	11	22.0	0	0.0
Encourage the patient to call if he has problems	16	32.0	34	68.0	0	0.0	34	68.0	16	32.0	0	0.0
Explain procedure prior to initiation as "clotting time, ECG, vital signs	27	54.0	19	38.0	4	8.0	47	94.0	3	6.0	0	0.0
Verbalize and reassure patient during care	23	46.0	19	38.0	8	16.0	45	90.0	5	10.0	0	0.0
Enter patient room calmly	11	22.0	35	70.0	4	8.0	24	48.0	26	52.0	0	0.0
Usually proves to be helpful	18	36.0	26	52.0	6	12.0	39	78.0	11	22.0	0	0.0

Table (6): Frequency and percentage distribution of the studied nurses according to the expression of emotions dimension of caring behaviors (n = 50).

Expression of emotions caring behaviors	Morning						Evening					
	Done satisfactory		Done unsatisfactory		Not done		Done satisfactory		Done unsatisfactory		Not done	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Has a concerned warm tone	28	56.0	17	34.0	5	10.0	28	56.0	17	34.0	5	10.0
Show genuine smile	23	46.0	21	42.0	6	12.0	15	30.0	35	70.0	0	0.0
Sit down with the patient	11	22.0	39	78.0	0	0.0	13	26.0	18	36.0	19	38.0
Provide a caring touch and eye to eye contact	8	16.0	18	36.0	24	48.0	15	30.0	22	44.0	13	26.0
Continue to be interested in the patient, even though a crisis or critical phase has passed	8	16.0	22	44.0	20	40.0	0	0.0	0	0.0	50	100.0
Introduce the statement to which the patient discusses feelings like pain, fear of death, anger	0	0.0	0	0.0	50	100.0	20	40.0	30	60.0	0	0.0
Believe and show awareness of patient subjective feelings as pain	12	24.0	38	76.0	0	0.0	15	30.0	28	56.0	7	14.0
Discuss the benefits of stress management techniques and anxiety reduction, in decreasing negative effect on oxygen demand	9	18.0	32	64.0	9	18.0	21	42.0	18	36.0	11	22.0
Observe patient's nonverbal cues	13	26.0	21	42.0	16	32.0	20	40.0	23	46.0	7	14.0
Makes patient aware of the way those closest to him are experiencing his situation	15	30.0	26	52.0	9	18.0	31	62.0	13	26.0	6	12.0
Establish support groups for individuals with similar problems for expression and exchange of emotions	20	40.0	24	48.0	6	12.0	20	40.0	24	48.0	6	12.0
Help the patient to feel that he has a certain control over his situation	27	54.0	15	30.0	8	16.0	32	64.0	12	24.0	6	12.0

Table (7): Frequency and percentage distribution of the studied nurses according to the problem-solving dimension of caring behaviors (n = 50).

Problem-solving caring behaviors	Morning						Evening					
	Done satisfactory		Done unsatisfactory		Not done		Done satisfactory		Done unsatisfactory		Not done	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Identify closest emotionally person to the patient who can offer support in decision making or informed consent	24	48.0	17	34.0	9	18.0	27	54.0	14	28.0	9	18.0
Plan strategy to modify the type of behavior	0	0.0	0	0.0	50	100.0	29	58.0	18	36.0	0	0.0
Ensure that the patient understands his illness and how he or she can assist in recovery	24	48.0	21	42.0	5	10.0	0	0.0	0	0.0	50	100.0
Assist in establishing realistic short- and long-term goals and desired outcomes	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Help the patient to find a coping strategy appropriate to his or her personality	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Help patient to see things from a different point of view	0	0.0	0	0.0	50	100.0	21	42.0	11	22.0	18	36.0
Try to identify with the patient the consequences of his negative behavior "like smoking."	16	32.0	12	24.0	22	44.0	26	52.0	22	44.0	2	4.0
Inform patient and those closest to him about the resources adapted to his needs, "e.g., community health centers, other professional, self-help groups	23	46.0	24	48.0	3	6.0	27	54.0	20	40.0	3	6.0
Know when to call the doctor	23	46.0	24	48.0	3	6.0	28	56.0	19	38.0	3	6.0

Table (8): Frequency and percentage distribution of the studied nurses according to the teaching dimension of caring behaviors (n =50).

Teaching caring behaviors	Morning						Evening					
	Done satisfactory		Done unsatisfactory		Not done		Done satisfactory		Done unsatisfactory		Not done	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Assess the patient's level of understanding and readiness to learn	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Assess the patient's level of information regarding disease and treatment	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Teach patients in an understandable language what is important to know about disease and treatment	24	48.0	21	42.0	5	10.0	24	48.0	21	42.0	5	10.0
Teach patient how to care for themselves whenever possible "as performing range of motion exercise"	21	42.0	24	48.0	5	10.0	3	6.0	0	0.0	47	94.0
Teach over the Counter medication danger as pain killer	0	0.0	0	0.0	50	100.0	18	36.0	23	46.0	9	18.0
Encourage the patient to ask any question he might have	11	22.0	30	60.0	9	18.0	0	0.0	0	0.0	50	100.0
Give ongoing information, education and support for patient and family, including advice on what to do if symptoms worsen	0	0.0	0	0.0	50	100.0	17	34.0	20	40.0	13	26.0
Advice of "what next" what can and cannot do when gets home as using stairs	12	24.0	25	50.0	13	26.0	0	0.0	0	0.0	50	100.0
Copy of treatment plans or records to be given to patient in language that he can understand	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Explain all expected equipment before they use	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Include relatives in any teaching program provided for the patient	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Evaluate patient's feed back	0	0.0	0	0.0	50	100.0	23	46.0	27	54.0	0	0.0
Establish teaching programs and correct misconceptions	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Reinforces and elaborates explanations given by the doctor	19	38.0	31	62.0	0	0.0	16	32.0	31	62.0	3	6.0
Give short teaching sessions because orthopedic patient tires easily	0	0.0	0	0.0	50	100.0	14	28.0	33	66.0	3	6.0
Advice about long-term follow up after discharge and referral to orthopedic rehabilitation programs	12	24.0	35	70.0	3	6.0	17	34.0	31	62.0	2	4.0
Respect patient's pace when giving information or answering his questions	9	18.0	38	76.0	3	6.0	17	34.0	30	60.0	3	6.0

Table (9): Frequency and percentage distribution of the studied nurses according to environment domain of caring behaviors (n = 50).

Environment caring behaviors	Morning						Evening					
	Done satisfactory		Done unsatisfactory		Not done		Done satisfactory		Done unsatisfactory		Not done	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Prevent noise, creates a quiet environment conducive to sleep, alleviate fear	23	46.0	27	54.0	0	0.0	26	52.0	24	48.0	0	0.0
Ensures a clean environment	33	66.0	17	34.0	0	0.0	38	76.0	12	24.0	0	0.0
Regulate visiting time according to patient condition	46	92.0	4	8.0	0	0.0	46	92.0	4	8.0	0	0.0
Allow bedside commode privilege	44	88.0	6	12.0	0	0.0	34	68.0	12	24.0	4	8.0
Before leaving check if the patient has everything, he needs	30	60.0	16	32.0	4	8.0	32	64.0	15	30.0	3	6.0
Help the patient to clarify which things he would like the significant person to bring him	26	52.0	21	42.0	3	6.0	30	60.0	17	34.0	3	6.0

Table (10): Frequency and percentage distribution of the studied nurses according to needs dimension of caring behaviors (n = 50).

Needs fulfilling caring behaviors	Morning						Evening					
	Done satisfactory		Done unsatisfactory		Not done		Done satisfactory		Done unsatisfactory		Not done	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Vital signs e.g., respiratory rate and depth	38	76.0	12	24.0	0	0.0	42	84.0	8	16.0	0	0.0
Check food from kitchen	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Observe tray pre and post meal	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Observe for healthy diet	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Obtain daily weight	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Observe urination	8	16.0	22	44.0	20	40.0	12	24.0	20	40.0	18	36.0
Observe defecation	12	24.0	22	44.0	16	32.0	18	36.0	18	36.0	14	28.0
Observe sleeping hours by the day or night	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Offer the patient backrub	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Ask the patient if he feel comfort	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Stay with the patient until symptom is relieved	23	46.0	21	42.0	6	12.0	29	58.0	16	32.0	5	10.0
Identify relief mechanism of pain	46	92.0	4	8.0	0	0.0	46	92.0	4	8.0	0	0.0
Administer medications regimen as prescribed	44	88.0	6	12.0	0	0.0	46	92.0	4	8.0	0	0.0
Know how to give the treatment "e.g. IV, IM injection"	44	88.0	6	12.0	0	0.0	44	88.0	6	12.0	0	0.0
Consider the ten rights in giving medications	42	84.0	8	16.0	0	0.0	43	86.0	7	14.0	0	0.0
Monitor medication for efficiency and toxicity, effect of interventions, fluid balance, vital signs, subjective feelings, exercise tolerance, associated clinical feature	33	66.0	15	30.0	2	4.0	34	68.0	15	30.0	1	2.0
Support the unable patient in taking medications	42	84.0	8	16.0	0	0.0	43	86.0	7	14.0	0	0.0
Check vital signs frequently and before and after medication	26	52.0	24	48.0	0	0.0	29	58.0	21	42.0	0	0.0
Know how to operate specialized equipment and ensure its availability on each shift "monitors, infusion pump"	20	40.0	30	60.0	0	0.0	24	48.0	26	52.0	0	0.0
Encourage the patient to perform exercises according to patient condition: active exercise, ROM, chest physiotherapy	19	38.0	26	52.0	5	10.0	25	50.0	20	40.0	5	10.0
Access to rehabilitation service including physiotherapy, exercise and walking programs	19	38.0	26	52.0	5	10.0	22	44.0	23	46.0	5	10.0

Table (11): Frequency and percentage distribution of the studied nurses according to spirituality dimension of caring behaviors (n=50).

Spirituality caring behaviors	Morning						Evening					
	Done satisfactory		Done unsatisfactory		Not done		Done satisfactory		Done unsatisfactory		Not done	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Offer the relaxation technique as a progressive relaxation technique	9	18.0	5	10.0	36	72.0	17	34.0	5	10.0	28	56.0
Confirm the presence of a close person who will not disturb the patient but give spiritual support	12	24.0	6	12.0	32	64.0	17	34.0	5	10.0	28	56.0
Encourage spiritual and religious practices as prayer, offer Quran and religion sounds meditation and visual guided imagery as appropriate	15	30.0	6	12.0	29	58.0	21	42.0	5	10.0	24	48.0
Help the patient to explore the meaning that he gives to his health condition	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Assess the need for spiritual councilor	0	0.0	0	0.0	50	100.0	0	0.0	0	0.0	50	100.0
Display calm and composure which contribute to the patient's confidence and security	18	36.0	5	10.0	27	54.0	19	38.0	5	10.0	26	52.0
Encourage the patient to have confidence in himself (no-judgment and never critique)	20	40.0	5	10.0	25	50.0	24	48.0	5	10.0	21	42.0
Draw patient attention to positive aspects concerning him and his state of health	16	32.0	5	10.0	29	58.0	22	44.0	5	10.0	23	46.0
Helps the patient to find the motivation to improve his state of health	20	40.0	9	18.0	21	42.0	25	50.0	9	18.0	16	32.0

Table (12): Descriptive analysis of the studied nurses according to their subtotal and total mean scores of caring behaviors dimensions (n = 50).

Caring behaviors dimensions	Morning shift	Evening shift
	Mean±SD	Mean±SD
Humanism	28.24±7.06	30.62±8.52
Helping relationship	36.92±3.94	37.18±2.83
Expression of emotion	22.82±4.06	27.40±4.35
Problem-solving	14.36±2.32	18.40±2.24
Teaching	22.02±2.83	27.28±3.50
Environment	12.98±2.17	15.92±2.43
Needs	48.36±8.04	47.96±6.89
Spirituality	14.22±5.07	15.58±5.01
Overall caring behaviors	199.92±13.50	222.34±14.27

Table (13): Correlation between fatigue level and nurses' caring behaviors dimensions in the morning shift (n = 50).

Caring. Behaviors% score	Fatigue level			F	p
	Mild (n = 5)	Moderate (n = 15)	Severe (n = 30)		
	Mean ± SD.	Mean ± SD.	Mean ± SD.		
Humanism	87.50±11.78	84.72±22.25	55.84±28.96	7.778	0.001
Helping relationship	63.75±16.48	67.09±11.44	64.80±12.39	0.214	0.808
Expression of emotions	79.0±8.22	69.33±20.52	59.0±20.15	3.015	0.059
Problem-solving	45.55±8.24	45.19±9.36	28.70±10.73	16.020	<0.001
Teaching	30.67±11.16	30.89±10.04	18.44±4.61	17.148	<0.001
Environment	92.0±17.89	88.0±20.77	73.67±21.09	3.349	0.044
Needs	65.0±16.96	70.0±18.42	72.33±21.67	0.298	0.743
Spirituality	25.56±22.77	25.93±31.26	31.11±28.01	0.204	0.816
Overall caring behaviors	59.58±3.67	59.65±6.42	51.32±5.75	12.257	<0.001

Table (14): Correlation between fatigue level and nurses' caring behaviors dimensions in the evening shift (n = 50).

Caring. Behaviors% score	Fatigue level			F	p
	Mild (n = 5)	Moderate (n = 15)	Severe (n = 30)		
	Mean ± SD.	Mean ± SD.	Mean ± SD.		
Humanism	90.0±9.25	87.62±16.80	52.02±29.53	12.499	<0.001
Helping relationship	70.0±6.09	70.63±1.98	63.34±10.18	4.485	0.016
Expression of emotions	74.16±17.03	74.72±15.86	57.22±16.41	6.806	0.003
Problem-solving	49.0±8.22	49.67±9.15	37.0±9.88	10.320	<0.001
Teaching	37.06±10.52	36.47±11.49	25.98±7.29	8.338	0.001
Environment	96.67±7.46	92.78±13.31	75.28±21.39	6.110	0.004
Needs	65.0±15.51	67.17±15.95	72.08±18.22	0.623	0.541
Spirituality	25.56±22.77	26.67±31.58	43.33±25.29	2.344	0.107
Overall caring behaviors	62.50±3.31	62.60±4.71	53.11±5.50	20.498	<0.001

F: F for ANOVA test, p: p-value for the association between different categories.

6. Discussion

Caring is considered the nursing role's fundamental concept and provides a framework to guide the nursing practice (Calong & Soriano, 2018). In the orthopedic department, the level of fatigue can potentially reach its threshold in light of challenging workload, the scope of the job, and assignments (Keerset al., 2013). Therefore, this study was conducted to investigate the relation between fatigue level and nurses' caring behavior in the orthopedic department.

As regards to studied nurses' characteristics, the present study indicated that the majority of nurses were married females, their ages were between 30 and <50 years old, had technical institute diploma and secondary nursing school education. Also, more than half had more than ten

years of experience. It could be interpreted as nursing in Egypt is primarily a female occupation, and males are admitted to nursing education lately. The results were matched with ELshrkawy (2016) in a study titled "nursing practice to prevent wound infection for orthopedic patients undergoing external fixator" reported that all nurses were married females and the majority had equal and more than ten years of experience.

The findings of the current study revealed that; the majority of studied nurses had no past medical history of neither psychological nor chronic illness and had less than one hour to reach the hospital. Concerning the level of fatigue, about two-thirds of the study sample reported a severe level of fatigue. This result may be due to poor working scheduling, mentally and physically demanding work, short breaks, and poor sleeping hours (as evident by

the current study that more than half of nurses reported inadequate sleeping hours). So, fatigue is often due to working long hours, where most of the studied nurses worked more than 40 hours per week. Fatigue affected nurses' lifestyle as they did not take a regular diet nor enough vegetables and fruits. Besides, they had no time to practice regular physical activities. All led to non-fixed sleeping time and non-adequate sleeping hours, consequently feeling of fatigue.

This result was supported by *Batak, Gvozdrenović, Bokan, and Bokan (2013)* in a study titled "the impact of nurses' shift work on the fatigue level" mentioned that in the clinical center in Serbia, nurses make a complaint of elevated fatigue level due to contact with tense situations. Also, *Han, Trinkoff, and Geiger-Brown (2014)* reported in their research named "factors associated with work-related fatigue and recovery in hospital nurses working 12-hour shifts" that nurses are functioning in medical-surgical and critical care units in a huge educational hospital experience elevated level of total fatigue.

In this study, the humanism, as a part of caring behavior, was revealed as a moderate level as near than half of studied nurses' did not answer patients' questions honestly, did not put the patient first, and did not consider the patient as a complete individual nor show interest in more than his health problem, while most of them were respect the patient privacy and be patient even with difficult patients during the morning shift. This result could be related to the nurse having a human sense, but they are too busy, stressed, overloaded with much writing, documentation, and many non-nursing functions.

A comparable study of *Calong and Soriano (2018)* in their study titled "caring behavior and patient satisfaction: Merging for satisfaction" reported that nurses set high worth on the value relating to patients' privacy and responding to the requirements of their patients. So, humanistic care had a high rate by mutually the nurses and patients. Also, *Qiuting, (2013)*, in his study named "humanistic caring: the core of nursing," mentioned that nurses remain with the patient for the most extended period. The sense of duty is to warm the chill not only to treat sick.

The results of the present study also showed that half of the nurses were dealing with the orthopedic patient as a disease rather than the patient as a whole. That is to say; they are not considered the patient as a human being who experienced a disease. In this study, the nurses did not use a professional relationship to deliver nursing care. Where they did not introduce themselves by stating clearly the name and position, asking the patient what name he preferred to be called, ask the patient how the night, the day was, and didn't assess patients' lifestyle so that genuine relationship can be established.

This finding could justify that working over-load, extended working hours, and inadequate sleeping hours make the nurse feel fatigued and affect her ability to use oneself therapeutically by utilizing empathetic relationships with patients and their families. This finding was evident in the current study, as ninety percent of the nurses were suffering moderate or severe fatigue. This finding is

supported by *Azzez, Abdulah, Piro, and Alhakem (2019)* in the study titled "sleep severity and fatigue manifestations in relation to the doctor-patient relationship" mentioned that increasing working hours by clinicians had a negative effect on their compliance in relationships with patients.

One of the notable findings in this study, a higher percentage of nurses, doing satisfactorily the caring behaviors related to helping relationship such as; listen to the patient attentively, encourage patient as says "you are doing well," check on patient frequently, explain procedure prior to initiation as "clotting time, ECG, vital signs," or verbalize and reassure patient during care particularly in the evening shifts, where the nurses may feel somewhat relaxed. However, in the morning shift, there was much work to be done by nurses as, assist doctors in their round, writing and administer prescribed medication, list them, bringing medication from the pharmacy, write the patients' diet list, routine registration of newly admitted patients or discharged patients, all were done at morning shift. These findings emphasized that the nurses could engage well in the helping relationship with orthopedic patients despite their suffering with a moderate and severe fatigue level. These findings evidenced the relationship between nurses' fatigue and caring behaviors.

Both humanism and helping relationship are manifested by the expression of emotions, which considered as the third dimension of caring behavior. The present study's result revealed that affective expressive caring had a moderate mean score in the morning and borderline high in the evening shift. As studied nurses didn't continue to be interested in patient even though a crisis or critical phase has passed in evening shift nor introduce statement to which the patient discusses feeling as pain, fear of death, anger during morning shift, more than two thirds done it unsatisfactorily in the evening shift. This finding may be interpreted as the nurses did not consider it as a nurse's duty and tasks as a part of caring served to the patients. This result contradicted *Fortuno, Oco, and Clores (2017)* in the research named "influential components of caring nurse-patient interaction," they observed that nurses focus on maintaining the emotional health during practice by showing kindness behavior becoming patient with patients.

Concerning problem-solving, the results clarify that the majority of nurses' caring behaviors related to problem-solving had a moderate mean score as nurses didn't plan strategy to modify type of behavior and help patient to see things from a different point of view (in morning shift), didn't assist in establishing realistic short and long term goals and desired outcomes or help the patient to find a coping strategy appropriate to his or her personality (in the morning and evening shifts). Besides, all the nurses did not ensure that the patient understands his illness and how he or she can assist in recovery (in the evening shift). This finding indicated the inability of nurses to deal with patients' problems, and they did not have the skills of a problem-solving approach. They may be referred to inadequate training with the modern nursing practice so that the nurses can solve patient-related problems. This finding

comes in line with *Durmaz, Serin, and Polat (2018)* in their study titled "determination of problem-solving and communication skills of nursing/midwifery students." They noticed that students involved in the study experienced moderate levels of communication and problem-solving skills and recommended that they receive training on improving problem-solving and communication skills through the nursing teaching program.

Basar, Akin, and Durna (2015), illustrated the same result, in their research named "evaluation of problem-solving and communication skills in nurses and nursing students," found that the subjects showed moderate levels of problem-solving skills and returned it to inadequate training.

Teaching is a valuable dimension in caring behavior. Surprisingly, the present study results revealed that nurses' caring behaviors related to teaching were the lowest mean score among all other caring factors. It was observed that most nurses ignored this caring element as nurses did not assess the patient's level of understanding and readiness to learn. Also, nurses did not assess the patient's level of information regarding disease and treatment nor teach the patient in an understandable language, which is important to know about disease and treatment. They copy treatment plans or records to the patient in language that he can understand, explain all expected equipment before they use, and include relatives in any teaching program provided for the patient (in the morning and evening shift) whereas half of them advised unsatisfactorily of what next, what can and cannot do when gets home as using stairs. The barriers of providing teaching caring behaviors to patients could be due to the working overload and shorting of staff that makes the nurse feel tired and do only the legal ordered requests in the patient's record, which were mostly instrumental caring.

Also, some nurses see that teaching is not their role. *El-Demerdash, Basal, and Soliman (2014)* supported this results in the research titled "barriers of patient health teaching among nursing students" clarified that excessive duties, failure to evaluate patient's learning needs and inability to choose suitable ways of teaching are barriers that hinder them during the teaching of the patient. This result was in agreement with *Livne, Sendelbach, and Steen (2017)* in a study titled "barriers to patient education and their relationship to nurses' perceptions of patient education climate," revealed that nurses' perceptions of patient education were not the nurse's duty.

The environment is considered another dimension of nurses' caring behavior. The results revealed a moderate mean score in the morning shift and high in the evening shift as more than half of studied nurses were prevent noise, creates a quiet environment conducive to sleep, alleviate fear unsatisfactorily in the morning shift, and satisfactorily in the evening shift. More than half of them also help the patient clarify which things he would like significant persons, to bring him during the morning and evening shift. Around two-thirds of them ensures a clean environment and before leaving check if the patient has everything he needs. Most of them regulate visiting time according to patient

condition. In this context, *Fini, Mousavi, Sabdani, and Hajbaghery, (2012)* in a study named "correlation between nurses' caring behaviors and patients' satisfaction" mentioned that nurses and the hospital authorities are responsible for creating a caring environment and improving the nurses' caring behavior to improve the patients' satisfaction.

Regarding needs, results reveal that all nurses check vital signs as respiratory rate and depth, a higher percentage of nurses know how to give the treatment, consider the ten rights of medications, support the patient in taking medications in morning and evening shifts. Besides, All studied nurses did not check food from the kitchen, observe tray pre and post-meal, observe a healthy diet, obtain daily weight, observe sleeping hours by the day or night, offer the patient backrub nor ask the patient if he feels comfort (in morning and evening shifts). This finding may be because nurses see the administration of medications is the primary role of nursing, doctors write medication in the patient's sheet, and the nurse can be punished legally if not perfectly perform it. At the same time, they give a low priority for other aspects of patients' needs such as checking food from the kitchen, observe tray or healthy diet, obtain daily weight, observe sleeping hours, and offer the patient backrub nor ask the patient if he feels comfortable. This finding is in agreement with *Alshammari, Hernandez, and Gonzales (2018)*, who reported that administrating medical treatments found to be most important, whereas personalized care was the least important.

Although the high level of spirituality may help patients cope with illness and offer hope, it was found that all studied nurses did not help the patient explore the meaning that he gives to his health condition or assess the need for a spiritual council. Less than half of them were encouraged to have confidence in himself and draw patient attention to positive aspects concerning him and his state of health. It was observed that while the patient vitally needs hope for positive expectation and allowing a sense of control, the nurse did not try to motivate or enhance that hope. Nurses did not consider the importance of spirituality in helping the patient find the motivation to improve his health. Nurses in this study did not comprehend the spiritual concept and did not deal with it as a part of caring behavior. Nurses need to remember that religion is a way of enhancing spiritual wellbeing and being non-judgmental and never critiquing one's belief and value.

Gallison, Xu, Jurgens, and Boyle (2013) illustrated the same result in their study "acute care nurses' spiritual care practices" explained that insufficient time considers as a barrier of students and nurses to providing spiritual care. Also, *Lind, Sendelbach, and Steen (2011)*, in their research titled "effects of a spirituality training program for nurses on patients in a progressive care unit," recorded that nurses express a feeling of not being prepared to provide the spiritual requirements of their clients. In this respect, leadership in the organization can improve caring nursing behavior through continuous education and training programs. This result was in line with *Kanmalia and*

Suikraduang (2015) in their study titled "evaluation of training program for new nurses to enhance caring behavior," suggested that administrators had an apposite role in the improvement of the human resource system and development of nursing care system.

The finding of the present study indicates that the overall nurses caring behaviors dimensions during morning and evening shifts had a moderate degree of caring behaviors. It might be due to a shortage of nursing staff, large numbers of patients and heavy workloads, nurses spend most of their time and energy to do the doctors' instructions, writing the reports and doing some secretarial tasks. In addition to extensive orthopedic patient needs of assisting in movement and provides their physical care. Such a condition would cause nurses fatigue and would hinder professional, caring behaviors with patients.

This finding is in agreement with *Abu Bakar et al. (2017)* in their study named "nurses' spirituality improves caring behavior," concluding that nurses did not routinely perform caring behaviors in daily practice. Caring behavior could be explained at a moderate level. Also, this result supported by *Adeyemo et al. (2016)* during their study orthopedic nurses' caring behavior as perceived by patients reported that basic needs were rated as "satisfactory." While the assistance of human needs, safe environment provision, psychological care assistance, and providing physical comfort rated as middling and finally, dietary needs, needs relating to communication and personal care rated as "not satisfactory."

The results of the present study revealed a significant positive correlation between fatigue levels and nurses' overall caring behavior in the orthopedic department in the morning and evening shifts. It could be interpreted as nursing care for traumatology, and orthopedic patients require a great deal of effort, which leads to nurses' fatigue. Fatigue has adverse effects on cognition, performance, and mood; consequently, it leads to a lack of concentration and attention, irritability and reduced physical capacity, poor judgment, slowing thought processes, and difficulties in communication. All affect nurses caring behaviors and drive the nurses to burnout.

This result following *Burtson and Stichler (2010)* in their study titled "nursing work environment and nurse caring: Relationship among motivational factors" as they found a statistically significant relationship between the nurses caring and their fatigue. This finding agrees with *Sarafis et al. (2019)* in their study named "the impact of occupational stress on nurses' caring behaviors and their health-related quality of life," they observed a significant correlation between fatigue and the dimensions of nurses' caring behaviors. This finding is in line with *Çelik, Taşdemir, Kurt, İlgezdi, and Kubalas (2017)* in their study titled "fatigue in intensive care nurses and related factors." They found a significant positive correlation between fatigue levels and the levels of resistance to the physical, mental, and emotional stress in nurses that might lead to poor caring nurses.

7. Conclusion

From the present study, it can be concluded that:

About two-thirds of the studied nurses had a severe level of fatigue. The overall caring behaviors dimensions were in a moderate degree. There is a significant positive correlation between fatigue level and the overall nurses' caring behaviors in both morning and evening shifts in the orthopedic department.

8. Recommendations

Based on the preliminary conclusions, it is recommended to:

- Provide nurses with fatigue countermeasure strategies as following healthy nutritional habits, consumption balanced diet and fluids, learning time management and sleep hygiene measures, and judicious use of caffeine.
- Provide organization strategies to overcome fatigue as provide staff with a flexible schedule, adequate rest periods during work, an adequate day off period, and evidence-based fatigue countermeasure.
- Nurses are recommended to pay more attention to their prodromal signs of fatigue and its effect on their caring behaviors.
- Implementing some in-service training programs about caring behaviors and what is expected from the nurse to do in certain hospital departments as an orthopedic unit.
- Replication of this study among all health team personnel to identify caring behavior and enabling for improving it in providing quality care for patients.

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