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EFFECT OF FOOT REFLEXOLOGY TREATMENT ON GLASGOW COMA SCORING AMONG MECHANICALLY VENTILATED PATIENTS

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ABSTRACT

Background: prolonged mechanical ventilation affects patients' cardiovascular, respiratory, musculoskeletal and digestive systems and psychological status. Reflexology treatment is relaxing and widely recognized as an effective treatment for many health problems it works well for any condition involving congestion and inflammation. Aim: to evaluate the effect of foot reflexology treatment on GCS among mechanically ventilated patients. Research Design: A quasi experimental (pre & post-test). Research Hypothesis: Mechanically ventilated patients who will receive the foot reflexology treatment will have better conscious level than those who will not. Setting: The study was carried out at different intensive care units (ICUs) at a Cairo University Hospital. Sample: A purposeful sample of 100 adult mechanically ventilated patients over a period of three months. Tools: One tool was utilized to collect data pertinent to the study; mechanically ventilated patient's data sheet that consists of: A- Demographic data, B- Medical data. Methodology: The study group constituted (50) patient, who was received two reflexology

session on feet and the control group constituted (50) patient who was received the routine care, GCS measured before session, immediate after, post 2 hours and post 4 hours. Result: Majority of the studied sample were male, with mean age 50.9 ± 12.7 in the study group as compared with 50.9 ± 11.7 in the control group. There was significant increase in GCS. So, because of the positive results of the intervention, the nurse practitioners may be trained about the technique of foot massage and reflexology.

Keywords: Foot - Reflexology – Mechanical ventilated patient – GCS

INTRODUCTION

Intensive care unit (ICU) maintains care to patients who are extremely ill and require 24-hour care and monitoring. A lot of ICU mortality rate was due to physiological parameters alteration [1]. One out of three patients in ICU requires mechanical ventilation. Invasive mechanical ventilation is potentially harmful due to physical (e.g., difficult breathing, pain and gastrointestinal complications) and psychological (e.g., fearfulness and anxiety). Hospitalization in ICU can cause hemodynamic instabilities and deterioration of the consciousness levels. The critical care environment represents a multifaceted experience for each patient, who may include anxiety due to the nature of the surroundings and their medical or surgical condition. As a result, they generate instabilities in vital signs and deterioration in consciousness levels [2].

Critical care nurses depend on medications as sedatives and opioids to improve symptoms and to help patients breathe. However, evidence increasingly specifies that overuse of these medications in patients receiving mechanical ventilations associated with risks (e.g., increased duration of mechanical ventilation and increased length of stay) [3]. Sedatives however also have side effects causing high blood pressure, slow heartbeat, coma, respiratory depression, muscle weakness and atrophy, increased risk of pneumonia and kidney problems. It may also prolong the need for ventilation which in turn increases the risk of complications [4].

Non-pharmacological complementary therapies can be used as adjuncts to sedatives and analgesics. Complementary therapies may be an important alternative to pharmacological interventions to treat these symptoms. Nurses are concerned with preventing and improving health problems and they view healing from a holistic perspective. ICU nurses have the opportunity

to improve outcomes for patients receiving mechanical ventilation [3].

Reflexology is an art, in which sensitivity and creativity is core and in the basic concepts of complementary medicine – body, mind and spirit – are fundamental to the care of clients. It also a therapeutic modality based on the principle that one small area of the body represents a 'map' of the whole [5]. Reflexology treatment is relaxing, making it popular for treating stress related disorders, alleviating tension and encouraging restful sleep. As well, it is widely recognized as an effective treatment for many health problems it works well for any condition involving congestion, inflammation and as a method of pain relief [6].

Reflexology is a technique of increasing life force through its individual zone by applied pressure on reflex points located on the face, feet, hands and ears over reflex points [7]. Using reflexology to restore the equilibrium balance based on a system of zones, that reflects an image of the body on the feet and hands which in turn effects the physical changes made in the body. Its popularity has increased in recent years as the public pursue more holistic ways to keep good health and well-being. In fact reflexology is increasingly being considered as a safe and effective way of decreasing causes of pain and diseases. Researchers have repeatedly shown that it has a positive effect on quality of life, stress, anxiety, and pain. However, few studies have attempted to correlate these results with any quantitative physiological or biochemical outcomes [8].

Reflexology is defined as: "A technique for helping to normalize body functions by applying the hands to reflex points in the hands, feet and ears that are related to the entire body's glands, organs and parts". In reflexology, reflex areas are stimulated using the fingers in order to transmit nerve impulses, restore proper flow of the blood stream and maintain the homeostasis of the body. Foot reflexology is a pressure technique applied to the nerve endings in feet [9].

The effects of reflexology on clients have been demonstrated in many clinical trials. Studies have revealed that reflexology reduces anxiety, nausea and vomiting, pain, sleeplessness and fatigue. In one study conducted on patients with chronic renal failure and hemodialysis patients, reflexology was have positive effects on cramps, fatigue, emotions and the immune system [9].

Nursing is a profession based on art and science. This means that a professional nurse learns to deliver care artfully with

compassion. Care should always modify with new discoveries and innovations. When nurses integrate the science and art into their practice, the quality of care provided to the patients is at a level of excellence that benefits in uncountable ways [1]. So the aim of this study is to evaluate the effect of foot reflexology treatment on GCS among mechanically ventilated patients

MATERIALS AND METHODS

Research Hypothesis

Mechanically ventilated patients who will receive the reflexology treatment will have better Glasgow Coma Scoring (GCS) than those who will not.

Research Design

A quasi experimental (pre & post-test) equivalent research design was utilized to examine the effect of reflexology treatment.

Subjects

A purposeful sample of 100 adult mechanically ventilated patients who were willing to participate in the study over a period of three months started from July to September 2015.

Inclusion criteria:

- Glasgow Coma Scoring not less than 8
- No feet ulcers, lesions, fracture or diabetic foot, and other feet diseases or problems.
- Absence of sedation or neuromuscular blocking agents.

Setting

The study was carried out at different intensive care units (ICUs) at Cairo University Hospital. These units were:

1- Critical Care Medicine Department consists of 25 beds.

2- The ICUs at a hospital for burn and emergency which consists of 20 beds.

Tools of Data Collection

To achieve the aim, data pertinent to this study were be collected utilizing one tool. This tool was constructed by the researcher then was revised by a panel of 5 critical care & emergency nursing, medical, and physiotherapy experts and was piloted on 10% of the study subjects. This tool is: Mechanically ventilated patients data sheet:

A- Demographic data: covers age, gender.

B- Medical data: was consisted of items as: medical diagnosis, duration of stay in Critical Care Unit, duration of stay on mechanical ventilator, GCS that were taken as admission data, pre and post reflexology treatment then post 2 & 4 hours.

Scoring system for GCS [10]. The GCS is divided into 3 categories, eye opening (E), motor response (M), and verbal response (V). The score is determined by the sum of the score in each of the 3 categories, with a maximum score of 15 and a minimum score of 3, as follows: GCS score = E + M + V.

Eye opening scores	Best motor response scores	Best verbal response scores
4: Spontaneously	6: Obeys command	5: Oriented and converses
3: To verbal command	5: Localizes pain	4: Disoriented and converses
2: To pain	4: Flexion withdrawal	3: Inappropriate words; cries
1: No response	3: Flexion abnormal	2: Incomprehensible sounds
	2: Extension	1: No response
	1: No response	

Interpretation:

Patients who are incubated are unable to speak, and their verbal score cannot be assessed. They are evaluated only based on eye opening and motor scores, and the suffix T is added to their score to indicate intubation. In incubated patients, the maximum GCS score is 10T and the minimum score is 2T.

Protection of Human Rights

An official permission to conduct the study was obtained from the vice dean of higher education and research; Faculty of Nursing - Cairo University and directors of Intensive Care Unit at Cairo university hospitals. Patients in both groups (or responsible members' agreement in case of disturbed conscious level) were informed that participation in the study is voluntary, and that can they could withdraw at any time during the study without giving reasons and their withdrawal would not affect the care they were receiving. Informed oral and written consent were taken to protect their rights before the start of the study after explanation of the nature and purpose of the study as well as the study's benefits and assured them that the study posed no risk or hazards on them. This written consent was granted by the Ethical Committee Faculty of Nursing - Cairo University. A unique identifying number (subject ID) was assigned to the data collected for each patient to maintain confidentiality and anonymity.

Procedure

The current study was conducted on three phases; preparatory, implementation and evaluation phases.

1- Preparatory Phase:

It involved construction and preparation of tool and testing its validity. Approvals were obtained from the administrative authorities of Cairo

University Hospital. The Critical Care Units were informed about the protocol of care, obtaining a list of patients who admitted to the critical care departments, connected with mechanical ventilators, and met the inclusion criteria. Patient or responsible person who was agree to participate in the study was interviewed individually by the researcher to explain the nature and purpose of the current study. A written consent was obtained. The baseline data was collected from patient's file, which include data related to demographic characteristics, medical and admission data. It took around 10 - 15 minutes to be completed for each participant. Then, it was ended by conduction of the pilot study.

2- Implementation phase

Actual implementation was initiated by random assignment to determine the study and control group by the odd number in the patient list was belong to the control group and the even number to the study group. The study group constituted (50) patient, who was received reflexology session on feet and the control group constituted (50) patient who was received the routine care. The researcher had been certified on how to apply reflexology from Open Academy of Complementary Medicine by a specialist in reflexology (30 hours workshop) that was certified from Cairo University & Ministry of Foreign Affairs on March – 2015 then participated in another workshop at August – 2015 (30 hours) for follow-up that the researcher master the technique. Regarding to the study group who received the reflexology session, the session was done within 30 – 45 minutes in specified reflex point on feet without any lubricant for two sessions, with continuous monitoring and close observation by the researcher. A foot reflexology therapy application protocol was developed to treat the patients holistically. A step-by-step procedure was followed uniformly to stimulate the most common reflexology areas as in reflexology maps. Preliminary phase contains a mild massage will be done to the all feet and then pressure will be applied once to specified reflex points related to brain, heart, renal and respiratory systems where the researcher used her thumb and index fingers to work on the patients feet. The application of reflexology treatment was done based on the reference books and evidenced base articles of reflexology and approved by a specialist in reflexology. The conventional therapy for both groups of pharmacological management was followed for both groups during the research period.

3- Evaluation Phase:

The researcher documented the GCS pre and after the session and two and four hours after intervention of each session. Finally after two sessions the mean of the data compared with the on admission parameters then compared with those of the control group.

Statistical Analysis Data

The Statistical Package for the Social Science (SPSS) software, version 21 was used for data entry and analysis.

RESULTS

Table (1) shows that more than half of the study group (58%) and the majority of the control group (82%) were male. Considering the age range of the sample was from 18 to >50 years old, more than half of the study and control groups were more than 50 years (58% & 60%) respectively, with mean age 50.9 ± 12.7 in the study group as compared with 50.9 ± 11.7 in the control group. No statistically significant differences were found between the two groups through demographic data except in gender ($\chi 2$= 6.857, p=.009).

Figure (1) illustrates that the common medical diagnosis among the study group was cardiovascular diseases (32%) followed by GIT diseases (22%), instead in the control group it was neurological diseases (32%) followed by GIT diseases (20%). There is no statistically significant difference between two groups related to medical diagnosis (X^2=9.926, P=.077).

Table (2) reveals that the mean of the days in ICU in the study group was (20.34 ± 10.722) and the mean in the control group (22.02 ± 11.724). Moreover, the mean of the duration of stay on MV in the study group were (18.98 ± 9.905) and in the control group (19.78 ± 11.696), no statistically significance differences between two groups regarding the number of the days in ICU (t=.748, p=.456) or regarding duration of stay on MV (t= .369, p=.713).

Table (3) clarifies that there were no statistical significance differences among the study group between the first and the second sessions in relation to the GCS.

Table (4) shows that there were no statistical significance differences among the control group in relation to the GCS.

Table (5) reveals that there were statistical significance differences the second session in GCS measures (F=5.269, p=.010).

Table 1: Frequency distribution of the study & control groups regarding their demographic data (n=100)

Variables	Study Group N. (%)	Control Group N. (%)	X^2	P
Gender • Male • Female	29 (58 %) 21 (42 %)	41 (82 %) 9 (18 %)	6.857	.009*
Age Category • 18-30 • 31-40 • 41-50 • >50	4 (8 %) 8 (16 %) 9 (18 %) 29 (58 %)	4 (8 %) 5 (10 %) 11 (22 %) 30 (60 %)	.909	.823
$\bar{X} \pm SD$	50.9 ± 12.7	50.9 ± 11.7		

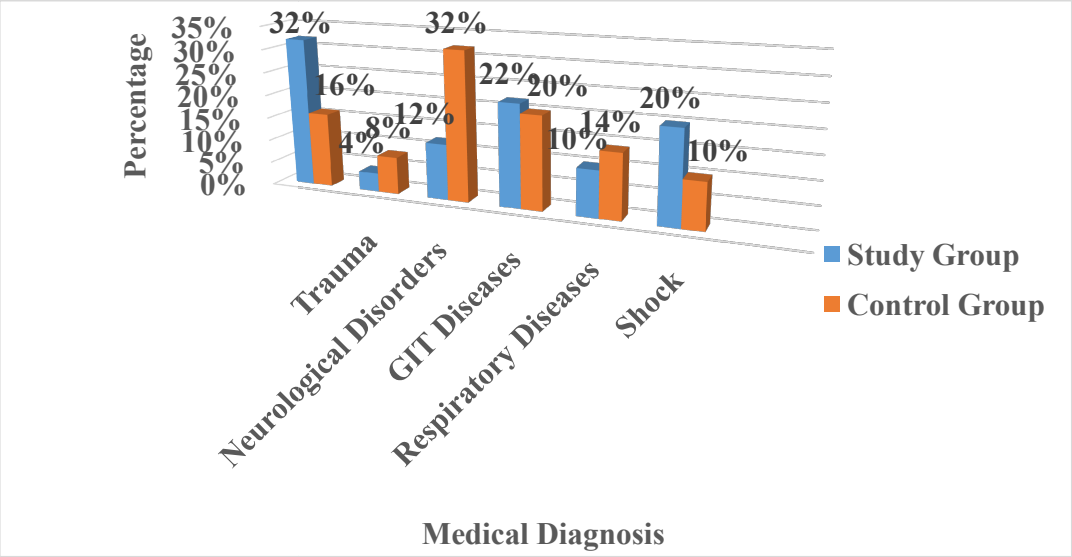

Figure (1): Percentage distribution of the study and control groups regarding their medical diagnosis (n=100)

Table (2): Means of the study & control groups regarding the number of days in ICU & the duration of mechanical ventilator (n=100).

Variables	Study Group $\bar{X} \pm SD$	Control Group $\bar{X} \pm SD$	t	P
N. of .Days in ICU	20.34 ± 10.722	22.02 ± 11.724	.748	.456
Duration of MV	18.98 ± 9.905	19.78 ± 11.696	.369	.713

*** P < 0.05 Significance value**

Table (3): Comparing means between session 1 & session 2 for the study group as regards to GCS (n=50).

Variables	Session	Study Group											
		Pre			Post			Post 2h.			Post 4h.		
		$\bar{X} \pm SD$	t	p	$\bar{X} \pm SD$	t	p	$\bar{X} \pm SD$	t	p	$\bar{X} \pm SD$	t	p
GCS	1 2	8.78 ± 1.02 8.78 ± 1.02	-	-	8.78 ± 1.02 8.78 ± 1.02	-	-	8.78 ± .99 8.84 ± .95	1.3	.18	8.92 ± .88 8.98 ± .96	.7	.49

*** P < 0.05 Significance value**

Table (4): Comparing Means of Session 1 & Session 2 for The Control Group as Regards to GCS (n=50)

Variables	Session	Control Group											
		Pre			Post			Post 2h.			Post 4h.		
		$\bar{X} \pm SD$	t	p	$\bar{X} \pm SD$	t	p	$\bar{X} \pm SD$	t	p	$\bar{X} \pm SD$	t	P
GCS	1 2	7.84 ± 1.7 7.84 ± 1.7	-	-	7.84 ± 1.7 7.84 ± 1.7	-	-	7.84 ± 1.7 7.84 ± 1.7	-	-	7.84 ± 1.7 7.84 ± 1.7	-	-

*** P < 0.05 Significance value**

Table (5): Differences between groups in relation to GCS during admission, session 1 & session 2 (n=100)

Variable	Admission & Session 1 (Pre – Post – Post 2h. – Post 4h.)		Session 2 (Pre – Post – Post 2h. – Post 4h.)	
	F	P	F	P
GCS	.103	.757	5.269	.010*

*** P < 0.05 Significance value**

DISCUSSION

The results of the present study demonstrated that there is no significant statistical difference related to GCS between means of session 1 & session 2 for the study or the control groups. However, there were statistical significance differences between groups related to the second session in GCS measures which mean improvement in the study group level of consciousness. These findings might be related to (from the research point of view and based on literature) that reflexology helps to maintain the balance of the body by stimulating the inactive parts or soothing those that are overactive [11].

Another one of the earliest theories is the hemodynamic theory which suggests that reflexology stimulation enhances blood flow to the corresponding organ or body part. The "nerve impulse theory" proposes that stimulation applied to specific reflex points on the feet enhance the nervous connection to the corresponding body parts. The autonomic nervous system stimulation regulates body systems that are under unconscious control such as breathing, heart rate, and blood pressure. These parameters are sensitive to stressors and fluctuate according to the physical or psychological changes experienced by an individual, via vagal modulation which controls calming and restful changes and regular functioning or sympathetic modulation, responsible for controlling arousal and the "fight or flight" response. Reflexology may work by stimulating the release of endorphins

and in this way may help to reduce pain and increase feelings of wellbeing and relaxation [8].

On the same line with these findings, a study about full body massage therapy by family members increases the level of consciousness of patients. Although few studies have been conducted on this subject, the significance of family participation in providing care to hospitalized patients in the ICU has been noticed by previous studies. Optimal health outcomes are achieved when patients' family members play an active role in providing physical, psychological, emotional, social, and developmental care for their patients. The possible reason for the effectiveness of family members' involvement can be explained by the transfer of their emotion to patients [2].

On the contrary, a study indicated that there were no statistically significant differences related to level of consciousness in the intensive care patients receiving mechanically ventilated support and they also mentioned that there was no information and research results were available in the literature concerning the effect of reflexology on the consciousness level [4].

CONCLUSION

The findings of the study revealed that there was effect of foot reflexology on the conscious level after the second session So; Nurse practitioners can be trained in the use of the foot reflexology. For assessing long term effects, it is recommended to take-up another long term study by controlling more variables.

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