# بسم الله الرحمن الرحيم


MONA MAGHRABY

# شبكة المعلومات الجامعية

# التوثيق الالكتروني والميكروفيلم

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التوثيق الإلكتروني والميكروفيلم

# جامعة عين شمس

# التوثيق الإلكتروني والميكروفيلم

# قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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***MONA MAGHRABY***

# Factors Contribute to Neonatal Nurses Pitfalls during Application of Pulse Oximeter in Neonatal Intensive Care Unit

Thesis

**Submitted for Partial Fulfillment for Requirments of Master Degree in Pediatric Nursing**

By

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**2019**

# Factors Contribute to Neonatal Nurses Pitfalls during Application of Pulse Oximeter in Neonatal Intensive Care Unit

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| Abbreviations | Full Term |
|---|---|
| **A_V** | Arterial to Venous |
| **BPD** | Broncho Pulmonary Dysplasia |
| **CCHD** | Critical Congenital Heart Disease |
| **COHb** | Carboxyhemoglobin |
| **CPAP** | Continues Positive Air Pressure |
| **CTS** | Computed Tomography Scanning |
| **ECMO** | Extra Corporeal Membrane Oxygenation |
| **SET** | Signal Extraction Technology |
| **ET** | Endotracheal Tube |
| **Hb** | Hemoglobin |
| **HRPO** | High Resolution Pulse oximeter |
| **IV** | Intravenous |
| **LEDs** | Light Emitting Diodes |
| **MCQ** | Multiple Choices Question |
| **MetHb** | Methemoglobin |
| **NICU** | Neonatal Intensive Care Unit |
| **O2** | Oxygenation |
| **OSA** | Obstructive Sleep Apnea |
| **PC** | Personal Computer |
| **PICC** | Percutaneous Intravenous Central Catheter |
| **PPOAB** | Partial Pressure of Oxygen in Arterial Blood |
| **PVI** | Pleth variability index |
| **ROP** | Retinopathy of Prematurity |
| **SLP** | Self Learning Package |
| **SO2** | Arterial Oxygen Saturation |
| **SPSS** | Statistacl Package for Social Science |
| **TAPVR** | Total Anomalous Pulmonary Venous Return |
| **TGA** | Transportation of Great Arteries |
| **UAC** | Umbilical Arterial Catheter |
| **UVC** | Umbilical Venous Catheter |

## Abstract

**Background:** Pulse oximeter is an essential monitoring and useful tool used in the intensive care unit although it has some pitfalls in it use. **Aim:** This study aimed to assess the factors contributing to neonatal nurses pitfalls during apply of pulse oximeter in neonatal intensive care unit. **Design:** A descriptive design was used in this study. **Setting:** The study was conducted at neonatal intensive care units affiliated to Ain Shams University Hospitals and Zagazig Universty Hospital. **Subject:** A purposive sample composed of 80 nurses ( 50 nurses work at Ain Shams University Hospital and 30 nurses' worke at Zagazig University Hospital who provid care to neonates with puls oximeter). **Tools of data collection:** Involved A structured Interview Questionnaire sheet and Observational checklist. **Results:** revealed that, less than half of studied sample had good knowledge and less than one quarter of them had poor knowledge regarding to care of puls oximeter, while approximately more than half of studied sample had competent practice regarding to care of pulse oximeter. Illustrated a positive correlation between total knowledge of the studied neonatal nurses and their total practice regarding care of pulse oximeter. **Conclusion:** Based on results of the current study, it concluded that, factors contribute to neonatal nurse's pitfalls during application of pulse oximeter in neonatal intensive care unit the lack of studied nurse's knowledge about regarding care of pulse oximeter as well as lack of practice (incompetent) contributes to pitfulls. **Recommendations:** An orientation program should be prepared to help newly appointed nurses to acquire, develop their knowledge and practice to deal with neonatal nurse’s care during application of pulse oximetry in neonatal intensive care unit



**Keywords:** Nurses, Neonates, Pulse oximeter, Performance.

# INTRODUCTION

A neonatal period includes the first 28 days (4 weeks) of life. During this period, following the cutting of the umbilical cord, the neonate establishes independent respiration and circulation and makes many more adjustment, such as feeding and weight gain **(Gupte, 2016)**.

Pulse oximeter is noninvasive test for measuring oxygen saturation. It utilize probe that usually clipped around feet toes, hand fingers, forehead and ear lope Normal reading at pulse oximeter is 95 %to 100% **(Duke & Keech, 2016).**

Pulse oximeter a small, U-shaped device that uses a light sensor to measure neonates blood-oxygen level and heart rate. This painless device, which is wrapped around the neonates toe or hand, and secured with a stretchy bandage, allows for monitoring of blood oxygen without the need for frequent blood samples ***(Vallet, et al., 2013)*.**

Pulse oximeter are very useful in the following neonatal cases with respiratory failure, sever bronchial asthma, mechanical ventilation, obstructive, sleep apnea, emergency room and weaning from supplemental oxygen (**Golian, 2014)**.

Pulse oximetry has limitations and affected by physiological and technical factors physiological states associated with decreased plasticity, such as shock, sever vasoconstriction and low cardiac output, may result in spurious pulse oximetry reading. Finally, increased level of an abnormal hemoglobin variants such as methamphetamine and carboxyhemoglobin are associated with in accurate pulse oximetry values and decreased peripheral perfusion as hypothermia or hypotension. Technical factors are excessive motions and incorrect place (**Weiss & Fleisher, 2015)**.

Injuries associated with the usage of pulse oximeter because pulse oximeter is non-invasive, pulse oximeter is considered a safe medical technology. While the sensor emits a small amount of heat into the skin, testing indicates that the sensors are considered safe up to a temperature of 43o C on well perfused skin for up to 8 hours. However, indicate that cases have sustained injuries from this modality. There have been at least eight occurrences of skin integrity problems including: cuts/lacerations, skin discoloration, blanched pressure areas/necrosis, induration, burns, and blisters **(Lu, et al., 2013).**

Neonatal nurses role for neonates with pulse oximeter should be brought the oximeter and sensor and set the parameters for the alarm on continuous measuring, avoid placing the probe on an extremity with arterial line, blood pressure cuff or intravenous (IV) line in place, Don't work the sensor to tightly as to prevent venous flow and cause inaccurate reading, to teach the skin condition, remove the sensor from the site at least every 2 hours to prevent allot of complications such as injury, ischemia and second, third degree of burn and clean the sensor with cleaning solution.**(James & Nelson, 2013)**.

**Significance of the Study:**

Pulse oximeter is an essential monitoring and useful tool used in the intensive care unit although it has some pitfalls in it use. Therefore this study should be dealt with the factors contribute to neonatal nurses pitfalls during apply of pulse oximeter in neonatal intensive care unit.

# AIM OF THE STUDY

This study aimed to assess the factors contribute to neonatal nurses pitfalls during application of pulse oximeter in neonatal intensive care unit.

**Research Question:**

What are the factors contributing to neonatal nurses pitfalls during apply of pulse oximeter in neonatal intensive care unit?