**BACKGROUND**

Pulse oximetry serves as a marker of the physiological status of the body's internal environment. The pulse oximeter has a red, infrared light that passes through the nail and finger to determine the percentage of oxygen that is being carried by the red blood cells (hemoglobin) (DeMeulenaere, 2007). By using this noninvasive measuring tool, healthcare professionals are able to determine the amount of oxygen carried by the hemoglobin molecules to the tissues and cells of the body (Casey, 2001). Disease processes affecting perfusion and circulation can contribute to lower SpO2 levels. In addition, healthcare providers have also been taught that nail polish could contribute to altered SpO2 results. There has been many articles such as “Do’s and Don’ts: Performing Pulse Oximetry” that have advised against doing pulse oximeter readings with artificial nails or nail polish, however, other articles have counteracted this approach and conclude that nail polish does not have much significance in readings. During this research, we sought to determine, through extensive review of articles, whether or not nail polish or artificial nails affected pulse oximeter results.

**AIM**

The aim of the literature review was to discover whether studies in the past were able to confirm or refute if there is statistical significance in pulse oximetry readings conducted with nail polish and/or artificial nails. Upon review of the research, we read studies conducted on relatively healthy individuals with baseline pulse oximetry readings between 95-100%.

**METHODS**

Databases used to conduct this literature review were EBSCOhost and ProQuest. Keywords used in search were “Effect of Nail Polish on Oxygen Saturation”. The search criterion was for articles posted from 2005-2016 and of English language. Fourteen articles were considered. Out of these fourteen articles, there were seven which had provided information meeting our inclusion criteria. Scholarly journals are from Intensive and Critical Care Nursing and The Journal for Nurse Practitioners.

**Inclusions:** Article studies that focused on a variety of polish colors (wine, white, brown, pink, blue, red — among others— and a clear top coat), test subjects of both genders, the bulk of the articles noted differences in pulse oximetry readings relating to nail polish, however, other articles have countered this approach and conclude that nail polish does not have much significance in readings. During this research, we sought to determine, through extensive review of articles, whether or not nail polish or artificial nails affected pulse oximeter results.

**Exclusions:** Peer reviewed articles, articles that focused on nail enhancements exclusively, studies done before the year 2005, and studies that included non-nail polish digit as a control, studies of subjects with asthma, studies that conducted several trial phases.

**FINDINGS**

A collective theory was made from the literature review that revealed significant differences in digit pulse oximetry readings after applying nail polish based on our academic teaching and clinical rotation practice guidelines.

- The bulk of the articles noted differences in pulse oximetry readings relating to both the different machines and nail polish colors used.
- The research indicated, although deviations in readings were noted, majority of the studies heed that the variance among pulse oximetry readings were not clinically significant enough—on average 0.5 or ≤ 2% discrepancy— to pose an issue when providing care.
- These studies indicate that modern technology may be able to elude the interference caused by wearing nail polish when performing readings.

**REFERENCES**

<table>
<thead>
<tr>
<th>SpO2, %</th>
<th>PaO2 mm Hg</th>
<th>Oxygenation Status</th>
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<tr>
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<td>80-100</td>
<td>Normal</td>
</tr>
<tr>
<td>91-94</td>
<td>60-80</td>
<td>Mild hypoxia</td>
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<tr>
<td>86-90</td>
<td>50-60</td>
<td>Moderate hypoxia</td>
</tr>
<tr>
<td>Less than 85</td>
<td>Less than 50</td>
<td>Severe hypoxia</td>
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</tbody>
</table>

Figure 1 Pulse Oximetry Values and their Meanings

Based on the reviewed research studies, we have come to find that the discrepancies in pulse oximetry readings with and without nail polish were off by no more than 2% (Rodden, 2006; Yamamoto, 2008). Though there is a difference in values, is this sufficient to conclude that the data is significant and therefore, nail polish must be removed from the fingernail in order to obtain a correct reading? Health care workers must take into consideration that costs of supplies, time, and possible patient distress are attributing factors with the removal process of the nail coatings. In the studies reviewed, most test subject demographics were young and healthy females (Sütcü, 2010; Yönt, 2013). With the focus mainly on this population, there is uncertainty of whether these studies are applicable across all age groups and health statuses. In addition, with these studies conducted, nail polish was applied the day of the study. Will testing the pulse oximetry readings after nail polish has been applied provide any significant alterations in the readings? Implications for the future would be to measure pulse oximeter readings in both male and female participants.