EFFECTIVENESS OF SKILL TRAINING PROGRAMME ON EARLY PREDICTION OF CLINICAL DETERIORATION BY USING PAEDIATRIC ACUTE CARE SCORE SCALE AMONG STAFF NURSES AT SMVMCH, PUDUCHERRY

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ABSTRACT

Children who are hospitalized may be urgently transferred to Paediatric Intensive Care Unit most often at a point of extreme clinical deterioration. The higher incidence for Paediatric Intensive Care Unit admission places the children at greater risk of morbidity and mortality when compared to children admitted in other wards. In order to overcome the transfer of children and reduce the mortality rate, a multitude of Paediatric Early Warning Systems [PEWS] modified to Paediatric Acute Care Score Scale [PACS] and in addition to PEWS, co-morbid factors are added in the PACS and it depends on hospital. The PACS was excluded with 2 domains such as nebulizer use, suctioning or persistent vomiting after surgery since it is only used to assess at the first 24 hours in emergency condition. The data was gathered and analyzed; it was evident that the Skill Training Programme for early prediction of clinical deterioration by using Pediatric Acute Care Score Scale among staff nurses was more effective.

Keywords: Pediatric Acute Care Score, Early prediction, Clinical deterioration.

I. INTRODUCTION

Children are the future promise of the world. Today’s children are the citizen of tomorrow. It is important that to raise a good future community for a good world. Children are high risk group to get injuries and accident than adult. Children’s are prone to get various minor and major health problems. There is no task more important than safe guarding their environment. The higher incidence for Paediatric Intensive Care Unit admission places the
children at greater risk for morbidity and mortality when compared to children admitted in other wards. Many studies have shown the major causes of urgent transfer to Paediatric Intensive Care Unit is mainly due to failure to recognize signs and symptoms of impending clinical deterioration.

In order to overcome the transfer of children and reduce the mortality rate, a multitude of Paediatric Early Warning Systems [PEWS] modified to Paediatric Acute Care Score Scale [PACS], it can identify children admitted to the casualty who require admission to the PICU, as well as, help staff nurses in the assessment of needs and accurate interventions for the children. It has helped to identify more than 75% of code blues within one hour of warning and has the ability to assess more than ten hours earlier the need to adapt a care plan to avoid rapid response.

In 2019 an estimated 5.2 million children under 5 years died mostly from preventable and treatable causes. Children aged 1 to 11 months accounted for 1.5 million of these deaths while children aged 1 to 4 years accounted for 1.3 million deaths. Newborns (under 28 days) accounted for the remaining 2.4 million deaths. An additional 500,000 older children (5 to 6 years) died in 2019. (WHO)

The purpose of the study was to assess the knowledge and skill of staff nurses for the early prediction of clinical deterioration, so that children who can clinically deteriorate in the course of their stay in the paediatric wards can be monitored more frequently than already done. Pediatric Acute Care Score consist of behavior, cardiovascular, respiratory and co-morbid factors of the children who are present to the hospital. Scores in each domain will be range from no deterioration, mild, moderate and severe. The total score can range from 0 to +6. There were four possible actions chosen by the nursing staff based on the score obtained from the Pediatric Acute Care Score. These actions could be as simple as informing the charge nurse, increasing the
observation frequency, calling other colleagues for a review from the medical team initiating the plan of care.

This has to be taken into consideration, and to be able to derive score for the day to day use and clinically follow up. The Pediatric Acute Care Score variables are given in alphabetical nominal rather than numerical values and medical co-morbidity factors are included in the study so that the child can be recognized according to the medical condition if present. The intervention will be scored according to the child condition and the PACS will be done twice at the time. The first assessment will be done at the time of presenting to the emergency service or casualty and observed for 24 hours using the Pediatric Acute Care Score for early prediction of clinical deterioration among children. Later admission to the ward prescribed by the clinicians, then the child is observed for up for 48 hours after admission to ward.

**Aim of the study**

The aim of the study was to evaluate the effectiveness of Skill Training Programme on early prediction of clinical deterioration by using Paediatric Acute Care Score Scale among Staff Nurses.

**Objectives**

- To assess the level of knowledge and skill for early prediction of clinical deterioration by using Paediatric Acute Care Score Scale among Staff Nurses.
- To evaluate the effectiveness of Skill Training Programme for early prediction of clinical deterioration by using Pediatric Acute Care Score Scale among staff nurses.
- To correlate the level of knowledge with skill for early prediction of clinical deterioration by using Paediatric Acute Care Score Scale among Staff Nurses.
- To associate the level of knowledge and skill for early prediction of clinical deterioration by using Paediatric Acute Care Score Scale among Staff Nurses with their selected demographic variables.

**Hypothesis**

- **H1**: There is a significant difference in the level of knowledge and skill among staff nurses regarding Paediatric Acute Care Score Scale before and after giving Skill Training Programme.
• **H2:** There is a significant correlation between knowledge and skill regarding Paediatric Acute Care Score Scale among Staff Nurses.

• **H3:** There is a significant association in the level of knowledge and skill regarding Paediatric Acute Care Score Scale among staff nurses with their selected demographic variables.

II. **MATERIALS AND METHODS**

In this study, pre experimental study with one group pre test and post test design was used to evaluate the Pediatric Acute Care Scale score on early prediction of clinical deterioration among staff nurses. The study was conducted at Sri Manakula Vinayagar Nursing College, Puducherry. The target population was Staff Nurses working at SMVMCH.

Based on the sample, total of 50 participants were selected by using Purposive sampling technique. Ethical consent was obtained following approval by the Institutional Ethical Committee of Sri Manakula Vinayagar Medical College and Hospital, Puducherry. The result was conducted by using descriptive and inferential statistics.

**DESCRIPTION OF TOOL:**

**Section A:**

It consists of Demographic Data for Staff Nurses working in SMVMCH such as Age, Gender, Religion, Educational Qualification, Designation, Total Years of Experience, Area of Working, Years of Experience in Pediatric Unit, Duration of working hours, Previous source of information.

**Section B:**

It consists of 25 self prepared Knowledge questionnaires regarding Paediatric Acute Care Score Scale. Each correct answer 1 mark, wrong answer 0, and responses will be scored from Inadequate Knowledge, Moderate Knowledge and Adequate Knowledge among Staff Nurses.

**Section C:**

It consists of 10 Observational questions to assess the Staff Nurses regarding Pediatric Acute Care Score Scale on early prediction of clinical deterioration for children admitted in hospital. Each question carry 1 mark (Yes) staff nurse perform the correct step and score 0 (No) Staff Nurse fail to perform the correct step and the response will be scored as Less competent, Moderately competent, Highly competent.
Data Collection Procedure:

Formal permission and IEC was obtained from the hospital authority. The study was carried out at SMVMCH, Puducherry. Based on Purposive Sampling Technique samples are selected. The purpose of the study was explained to each staff nurses and oral consent was obtained from them. On the first day, pre test was assessed for the samples on their knowledge and skill regarding Pediatric Acute Care Score Scale for 15 minutes. After Pre-test, Skill Training Programme was conducted on the same day for the same sample for 30 minutes. On the seventh day, post-test was conducted to the same sample for 15 minutes regarding knowledge and skill on Pediatric Acute Care Score Scale.

Statistical analysis:

The data was analyzed using both descriptive and inferential statistics. Parametric tests and nonparametric tests were used. The effectiveness of skill training programme was analyzed by using paired ‘t’ test and Chi square test is used to analyzing the association of the selected demographic variables before and after administering Skill Training Programme. A ‘p’ value of 0.05 was considered to be statistically significant for the interpretation of results. The analysis and graphs were carried out in accordance with the above data for easy comprehension. (Statistical Software Services).

III. RESULTS AND DISCUSSION

Socio demographic data: Out of 50 staff nurses the data shows majority on 24 (48%) are in the Age of 21 – 25 years, 18 (36%) are in 26 – 30 years, 5 (10%) are in 31 – 35 years, 3 (6%) are in > 35 years. In the aspect of Gender the data shows majority on 45 (90%) of them are Female, 5 (10%) of them are Male. In the aspect of Religion the data shows majority on 50 (100%) of them are Hindu. In the aspect of Educational Qualification the data shows majority on 41 (82%) of them are B.Sc., Nursing, 7 (14%) of them are GNM, 1 (2%) of them are P. B. B.Sc., Nursing, 1 (2%) are in M.Sc., Nursing. In the aspect of Designation the data shows that majority on 42 (84%) of them are Staff Nurse, 7 (14%) of them are Ward In-charge, 1 (2%) of them are ANS. In the aspect of total years of experience the data shows majority on 33 (66%) of them are 0 – 5 years, 14 (28%) of them are 6 – 10 years, 2 (4%) of them are 11 – 15 years, 1 (2%) of them are 16 – 20 years. In the aspect of area of working 28
(56%) of them are critical care unit, 21 (42%) of them are in Ward, 1 (2%) of them are OPD. In the aspect of Years of Experience in Pediatric unit 32 (64%) of them are 0 – 5 years, 15 (30%) of them are 6 – 10 years, 2 (4%) of them are 16 – 20 years, 1 (2%) of them are 11 – 15 years. In the aspect of Duration of Working Hour 32 (64%) of them 6 hours, 14 (28%) of them are 8 hours, 4 (8%) of them are 12 hours. In the aspect of Previous Source of information 50 (100%) of them are No respectively.

Table 1: Frequency and percentage wise distribution of level of knowledge regarding Paediatric Acute Care Score Scale among Staff Nurses at SMVMCH. (N=50)

<table>
<thead>
<tr>
<th>SCORING INTERPRETATION</th>
<th>PRE-TEST</th>
<th>POST-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Inadequate</td>
<td>36</td>
<td>72</td>
</tr>
<tr>
<td>Moderately adequate</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>Adequate</td>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>

Table 1 shows Frequency and Percentage wise distribution of level of knowledge regarding Paediatric Acute Care Score Scale among Staff Nurses in Pre and Post test. The findings reveal that out of 50 staff nurses. In Pre test, 36 (72%) are in inadequate knowledge, 14 (28%) are in moderate knowledge; none of them are in adequate knowledge. In Post test, 23 (46%) are in moderate knowledge, 27 (54%) are in adequate knowledge, none of them are inadequate knowledge respectively.
Table 2: Frequency and percentage wise distribution of level of skill regarding Paediatric Acute Care Score Scale among Staff Nurses at SMVMCH. (N=50)

<table>
<thead>
<tr>
<th>SCORING INTERPRETATION</th>
<th>PRE-TEST</th>
<th>POST-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Less Competent</td>
<td>27</td>
<td>54</td>
</tr>
<tr>
<td>Moderately Competent</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Highly Competent</td>
<td>01</td>
<td>02</td>
</tr>
</tbody>
</table>

Table 2: shows Frequency and percentage wise distribution of level of skill regarding Paediatric Acute Care Score Scale among Staff Nurses in Pre and post test. The finding reveals that out of 50 staff nurses, In pre test 27 (54%) are in Less competent, 22 (44%) of them are in moderately competent, 1(2%) of them are in Highly competent. In Post test 19 (38%) of them are in moderately competent, 31 (62%) of them are in highly competent, none of them in less competent respectively.

Table 3: Comparison of mean and standard deviation of regarding level of knowledge regarding Paediatric Acute Care Score Scale among Staff Nurses at SMVMCH. (N=50)

<table>
<thead>
<tr>
<th>KNOWLEDGE</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>Paired ‘t’ test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>7.42</td>
<td>2.65</td>
<td>13.024**</td>
</tr>
<tr>
<td>Post-test</td>
<td>17.84</td>
<td>4.82</td>
<td></td>
</tr>
</tbody>
</table>

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*-$p<0.05$, significant and **-$p<0.001$, highly significant

Table 3: shows Comparison of mean and standard deviation of regarding level of knowledge regarding Paediatric Acute Care Score Scale among Staff Nurses in pre test and post test. The finding reveals that their mean, standard deviation values are 7.42, 2.65 are in pre test. In post test their mean, standard deviation values are 17.84, 4.82 in knowledge. In the aspect of Paired ‘t’ value of knowledge in both pre and post test is 13.024** and the $p<0.001$, Hence it is highly significant respectively.

Table 4: Comparison of mean and standard deviation of regarding level of skill regarding Paediatric Acute Care Score Scale among Staff Nurses at SMVMCH.

(N=50)

<table>
<thead>
<tr>
<th>SKILL</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>Paired ‘t’ test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>3.40</td>
<td>1.714</td>
<td>23.282**</td>
</tr>
<tr>
<td>Post-test</td>
<td>7.18</td>
<td>1.599</td>
<td></td>
</tr>
</tbody>
</table>

*-$p<0.05$, significant and **-$p<0.001$, highly significant

Table 4: shows Comparison of mean and standard deviation of regarding level of skill regarding Paediatric Acute Care Score Scale among Staff Nurses in pre test and post test.
The findings reveal that their mean, standard deviation values are 3.40, 1.714. In the aspect of post test mean and standard deviation values are 7.18, 1.599. In the aspect of Paired ‘t’ value of skill in both pre and post test is 23.282** and the p<0.001, Hence it is highly significant respectively.

![Standard Deviation and Mean Chart]

It represents the effectiveness of skill training programme regarding Pediatric Acute Care Score Scale among staff nurses in the term of booklet, it helps the staff nurses to easily understand, grasp and also significant increase in their skill. The Paired ‘t’ test overall value is 13.02** for knowledge, 23.282** for skill which are statistically highly significant at the level of p<0.001. Finally, it seems that there is significant difference between pre test and post test knowledge and skill regarding Pediatric Acute Care Score Scale among staff nurses.

**Table 5: Correlation between the knowledge and skill regarding Paediatric Acute Care Score Scale among Staff Nurses at SMVMCH.**

<table>
<thead>
<tr>
<th></th>
<th>Knowledge score</th>
<th>Skill score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation (r)</td>
<td>0.762</td>
<td>-</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.001</td>
<td>-</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td><strong>Skill score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation (r)</td>
<td>-</td>
<td>0.762</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>-</td>
<td>0.001</td>
</tr>
<tr>
<td>N</td>
<td>-</td>
<td>50</td>
</tr>
</tbody>
</table>
Table 5: shows Correlation between the knowledge and skill regarding Pediatric Acute Care Score among staff nurses.

The findings reveal that their Knowledge score r value is 0.762, coefficient of correlation value is 0.001 and N value is 50. In the aspect of skill score in r value is 0.762, coefficient of correlation value is 0.001 and N value is 50, Hence statistically the knowledge and skill regarding Pediatric Acute Care Score is positively correlated respectively. Hence the level of knowledge with skill regarding Pediatric Acute Care Score is positively correlated. Hence Hypothesis \( H_2 \) is accepted.

IV. CONCLUSION

The study of preliminary effort that focused on to evaluate the effectiveness of Skill Training Programme on early prediction of clinical deterioration by using Paediatric Acute Care Score Scale among staff nurses at SMVMCH, Puducherry. A pre experimental (one group pre test and post test) research design was used in this study. The data was collected from 50 staff nurses. The conclusion drawn in his study subjects was as follows: The study result shown that the paired ‘t’ test value of knowledge among staff nurses was ‘t’ = 13.024**. The paired ‘t’ test value of skill among staff nurses was 23.282**. Hence it is highly significant. The higher mean difference shows positive outcome among staff nurses. Therefore the education regarding early prediction of clinical deterioration by using Paediatric Acute Care Score Scale among staff nurses which will increase knowledge and skill. In conclusion it was evident that Skill training programme on evaluate the effectiveness of Skill Training Programme on early prediction of clinical deterioration by using Paediatric Acute Care Score Scale among staff nurses was very effective. The PACS application in clinical settings will improve the knowledge, change the quality of care among staff nurses among children who are entering the emergency services and admitted in wards.

REFERENCES


