

# **Outcome of Nurse-Led Educational Intervention On Synactive Theory of Development Among Nurses in Neonatal Intensive Care Unit in Selected Hospitals, Lagos State, Nigeria**

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## **Abstract**

The term synaction refers to the relationship between all the subsystem in the neonate and how instability in one system will affect all other subsystem. Inadequate knowledge of Synactive Theory of Development (STD) in the care of neonate may lead to short- or long-term complications. Therefore, the objective of this study was to assess the level of knowledge pre and post intervention program on STD in Neonatal Intensive Care Unit (NICU) in the three selected hospitals. A quasi-experimental design was employed for this study. Total enumeration was adopted to include 50 neonatal nurses. Data were collected using a well-structured questionnaires pre and post intervention. Findings showed that more of the participants 68% had an average knowledge at pre intervention while at post intervention more than half of neonatal nurses had above average knowledge 74% about STD. Assessment on participants hospital and year of experience mean score= 23.76 while only 2 of the participants were found below average knowledge after the intervention. The hypothesis on the knowledge of STD in the three hospitals revealed significance difference in pre and post mean score knowledge of synactive theory in the three selected hospitals in Lagos State. In Massey hospital (mean

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difference = 7.89,  $t_{(df)}=6.21_{(23)}$ ,  $p<0.05$ ), Randle hospital (mean difference = 5.85,  $t_{(df)}= 2.83_{(11)}$ ,  $p<0.05$  ) and for Ifako hospital (mean difference = 3.33,  $t_{(df)}= 2.50_{(13)}$ ,  $p<0.05$ ). In conclusion, the intervention program had been an attractive vehicle to help in better implementation of developmental care practices on neonates. Therefore, the nurse-led educational intervention training on STD has improved knowledge on STD. It was recommended among others that regular educative re-training should be organized to NICU nurses.

**Keywords:** Educational Intervention, Outcome, Neonatal Intensive Care Unit (NICU), Nurses, Synactive Theory of Development (STD),

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## Introduction

Theorists have contributed greatly towards the development of body of knowledge of the Nursing profession. Nurses need to identify and appreciate the need for nursing theories to practice. Practice is the core for the development of nursing theory whereas nursing theory must be authenticated in practice. Despite the expansion, development, and study of nursing theory, the 'gap' between theory and practice is a usual perception among the nurses. Nurses in practice don't usually use the language of nursing theory unless commanded to do so. To provide effective, efficient, and holistic care in neonatal intensive care unit (NICU), nurses working in NICU must rely on sound understanding of synactive theory of development, to improve and implement the plan care (Saleh, 2017).

The understanding of synactive theory of development (STD) is essential in the care of preterm babies in Neonatal Intensive Care Unit (NICU) because it improves practice and influence the health, quality care rendered to the neonate, reduces illness and death rate, and reduce complications and disability. STD enhances the way the neonate appears to handle the experiences from the surrounding rather than the individual ability. STD is useful in identifying early developmental process and put in place precise support for preventive measures and quick management when difficulties in differentiation and regulation are recognized in preterm (Als, et al, 2013). Synactive theory of development was developed by Heidelise Als in 1982, an American Neuro Psychologist in Boston, she provided a different access to brain research through child's behavioural observation (Als, 1986). She described STD as the way in which preterm neonates interact with his/her new surrounding via behavioural cues and this can be achieved through ordinary observation. Detailed behavioural observations of the neonate in the NICU become the professional's guidelines to provide consistently individual-adapted, developmentally helpful care. The detailed behavioural views led to the complete dynamic preparation termed the Synactive theory of preterm development (Als, et al, 2013; Mahboobeh, et al, 2017).

Synactive theory of development identifies development as a communicative and hierarchical process which comprises five components that can be explained independently, yet function in relation to the rest subsystems. The components are: autonomic system, motor system, behavioral states, attention/interaction, and self-regulatory system. Autonomic system is the basic physiology functioning of the body necessary for survival, and the indicators are tremor/startles, heart rate, respiration rate, and skin colour. Motor system is the neonate movement, activity, motor tone, posture taken by the new-born and the quality of the limb's movement. Behavioural States is a way of grouping the level of central nervous system e.g. awake/alert, crying, arousal, and sleepy/drowsy. Attention/interaction is the ability of the neonate to relate with the environment and caregiver. Finally, self-regulatory system is the presence and success of the neonate's effort to achieve and maintain a balance of the four subsystems (Als. 2013). These systems develop in the embryo, in the foetus, and in the new-born according to independent development. The five components are constantly influenced interdependently and their development takes place interactively with the environment.

A total of 2.5 million children died in the first month of life in 2018 globally (WHO,2019). In Europe and North America, who have one of the lowest under-five mortality rates among sustainable development goal region, 54% of all under- five mortality happen during neonatal period. An exception is southern Asia, where the rate of neonatal deaths is among the highest (62%) despite a relatively high under-five death rate. WHO (2019) further stated that a child born in developing countries is 10 times more likely to die in the first

month than a child born in a high-income country. The report further emphasized that 75% of neonatal mortality occurs during the first week of life, and one million mortality occurs within the first 24 hours. WHO, (2017) stated that infant death in Nigeria is 69.8 death per 1000 live birth, 74.5 male death per 1000 live birth while female is 64.8 death per 1000 live birth. Central Intelligence Agency (2019) reported that infant mortality rate in Nigeria was 59.8% per 1,000 live birth, female 54 deaths/1000 live birth while male was 65.4 deaths/1000 live birth. UNICEF, (2019) reported Nigeria has one of the world's highest infant death rate, one in 34 babies born in Nigeria die before their first birthday. They further stated that around 103 babies out of 1,000 live birth die in Masaka town, Nasarawa State in Nigeria. Neonatal death rate in Nigeria in 2015 was 34 deaths per 1000 live birth (Morakinyo & Fagbamigbe, 2017; Lawani, et al, 2014).

Hockenberry and Wilson (2013) identified core nursing care of the new-born and family. These include: assessment of the new-born, maintain patent airway, maintain stable body temperature, protect from infection and injury, provide optimal nutrition, promote parent-infant bonding/attachment and prepare for discharge. The knowledge of synactive theory of preterm neonate neurodevelopment by the paediatric nurse coupled with core nursing care will enhance her prompt intervention when the infants is going through stress, and help her to organize neonatal intensive care unit for the betterment of neonate and achievement of positive outcome. However, based on researcher's observation during clinical posting, the STD has not been known by the NICU nurses. It was also observed during clinical posting that nurses working in NICU had limited knowledge of STD. Therefore, the NICU nurses could not understand the relationship between the STD and nursing practice, and failure to bring in STD into nursing practice may result into inappropriate client care and negative outcome.

Based on the previous studies on STD which revealed low level of knowledge of STD among nurses leading to several complications in early or later life of the child, the researcher is providing a source of learning to the participants in order to improve their knowledge on STD in the care of neonate in NICU. This study therefore, seeks to implement an educational intervention on knowledge of STD among the neonatal nurses working in NICU in selected hospitals in Lagos State, Nigeria. In view of the above, this study specifically:

1. assessed pre and post knowledge level of Synactive Theory of Development (STD) among NICU nurses on synactive theory of development in the three hospitals;
2. determined the difference between pre- and post-intervention knowledge on synactive theory of development among NICU nurses in the three selected hospitals; and
3. determined difference between post intervention knowledge among nurses based on their work experience.

### Research Question

This research question was raised for this study:

1. What is the pre and post knowledge level of neonatal intensive care nurses on STD in the three hospitals?

### Research Hypotheses

The following hypotheses were postulated for this study:

1. There is no significant difference between pre- and post-intervention knowledge of STD in the three selected hospitals in Lagos State.
2. There is no significant difference between post intervention knowledge among nurses based on their work experience.

## Methodology

This study adopted quasi – experimental research design of one group pre- and post-intervention. The study was conducted in three Hospitals in Lagos State, Nigeria. The target population for this study comprises of available nurses working in NICU at the selected hospitals at the time of study in Lagos state. Multi stage sampling procedure was used for the sample selection. The total enumeration method was used which captured fifty (50) nurses working at NICU from the selected hospitals. A self-developed structured test paper was used to collect data from the respondents on the knowledge. Training package was also used during intervention phase. To ensure the content and face validity of the instrument, the instrument was given to two experts of Nursing Science for review, correction and appraisal.

The data collection procedure comprised of pre-intervention, intervention and post-intervention stage. A training package on synactive theory of development was administered on the participants. Data was collected, entered, cleaned, and analysed using statistical package for social science (SPSS) version 21.0. Descriptive statistics of frequency count, percentages, mean scores and standard deviation was used to describe the knowledge regarding the synactive theory. Hypotheses were tested using inferential statistics of t-test and Analysis of Variance at 0.05 level of significance.

## Results

**Research Question 1:** What is the pre and post knowledge level of neonatal intensive care nurses on STD in the three hospitals?

**Table 1: pre and post intervention knowledge level of neonatal nurses on synactive theory**

Levels of knowledge	Category of Scores	Pre-intervention			Post intervention		
		F	%	Mean ±SD	F	%	Mean ±SD
Above average	≥23-30	5	10%	18.26 ±4.98	37	74%	23.76 ±3.87
Average	15-22	34	68%		11	22%	
Below average	0-14	11	22%		2	4%	
<b>Total</b>		50	100				
<b>Pre: Min =0; Max=29; Post: Min=11; Max=30</b>							
<b>Mean difference: 5.5</b>							

**Source: Field study, 2021**

Table 1 shows the pre-post intervention knowledge mean score of participants on synactive theory. Pre-intervention mean score shows 18.26±4.98 categorise as average score on knowledge with 34(68%) participants while in post intervention a mean score of 23.76±3.87 was discovered categorise as above average score on knowledge with 37(74%) participants. Therefore, the knowledge level of the neonatal nurses on STD was high at post intervention but was average before intervention.

**Table 2: Pre and post knowledge level of NICU nurses on STD in the three hospitals**

Levels of knowledge	Category of Scores	Pre-intervention			Post intervention		
		Massey	Randle	Ifako	Massey	Randle	Ifako
Above average	≥23-30	7(30%)	-	2(16%)	20(85%)	7(58.3%)	9(61.5%)
Average	15-22	14(58.9%)	8(66.6%)	10(72.2%)	4(15%)	4(33.3%)	4(33.3%)

		)	)	)		)	)
Below average	0-14	3(11.1%)	4(22%)	2(11.1%)	-	1(8.3%)	1(5.5%)
<b>Total</b>		<b>24</b>	<b>12</b>	<b>14</b>	<b>24</b>	<b>12</b>	<b>14</b>
<b>Mean: SD</b>		20.2±4.58	15.4±5.50	18±4.28	25.2±2.58	22.5±4.21	23.2±4.29
<b>Mean diff.</b>		5.0	7.1	5.2			

Source: field study, 2021.

Table 2 presents the level of knowledge of nurses working in NICU before and after the intervention program on synactive theory in the three hospitals. In Massey hospital, at pre intervention a mean score knowledge of 20.2±4.58 was shown signifies an average score of knowledge but at post intervention a mean score of 25.2±2.58 was indicated, signifies above average score on knowledge. Therefore, the knowledge level of the neonatal nurses in Massey hospital on STD was high at post intervention but was average before intervention. At Randle hospital, pre intervention mean score knowledge of 15.4±5.50 was shown signifies an average score of knowledge while at post intervention a mean score of 23.2±4.29 was revealed, signifies above average score on knowledge. Therefore, the knowledge level of the neonatal nurses in Randle hospital on STD was average at pre intervention but was high after intervention. In Ifako hospital, pre-intervention mean score knowledge of 18±4.28 was shown signifies an average score on knowledge while at post intervention a mean score of 22.5±4.21 was revealed signifies above average score on knowledge. Therefore, the knowledge level of the neonatal nurses in Ifako hospital on STD was above average at post intervention but was average before intervention. Therefore, this infers that in the three hospitals after intervention, most the neonatal nurses increase from their baseline knowledge about synactive theory.

### Test of Hypotheses

**Hypothesis 1:** There is no significant difference between pre- and post-intervention knowledge of STD in the three selected hospitals in Lagos State

**Table 3: t-Test showing a significant difference between pre and post intervention knowledge of neonatal nurses on synactive theory in three selected hospital**

Hospitals		N	Mean	Sd	Std. Error	t (df)	Mean difference	p-value
Massey	Pre	24	17.3	±4.92	1.16	6.21(23)	7.89	.000
	Post		25.2	±2.58	0.60			
Randle	Pre	12	16.6	±6.14	1.14	2.83(11)	5.85	.014
	Post		22.5	±4.29	1.64			
Ifako	Pre	14	19.8	±4.26	1.00	2.50(13)	3.33	.023
	Post		23.2	±4.29	1.101			

Table 3 shows a significance difference in pre and post mean score knowledge of synactive theory in the three selected hospitals in Lagos State. In Massey hospital (mean difference = 7.89,  $t_{(df)}=6.21(23)$ ,  $p<0.05$ ), Randle hospital (mean difference = 5.85,  $t_{(df)}=2.83(11)$ ,  $p<0.05$ ) and for Ifako hospital (mean difference = 3.33,  $t_{(df)}=2.50(13)$ ,  $p<0.05$ ). Hence, with this stated result, neonatal nurses' knowledge from each selected hospital was not static after post intervention. Therefore, the null hypothesis which stated that there is no significance difference between pre and post intervention knowledge of nurses in the selected hospitals towards synactive theory is hereby rejected by this finding. Since  $p<0.05$

and post-intervention knowledge mean score is higher than the pre-intervention. This implies that the intervention was impacting.

**Hypothesis 2:** There is no significant difference between post intervention knowledge among nurses based on their work experience.

**Table 4: ANOVA showing significant difference between post intervention knowledge among NICU nurses based on their years of experience**

	Sum of Squares	df	Mean Square	F	Sig.	Decision
Between Groups	55.472	3	18.491	1.251	.302	P>0.05
Within Groups	679.648	46	14.775			
<b>Total</b>	<b>735.120</b>	<b>49</b>				

  

Years of experience	2-5yrs	6-10yrs	11-15yrs	16-20yrs	20yrs and above	Total
Frequency	20	9	4	3	14	50
Mean ±SD	24.1±4.16	21.7±5.44	23.3±2.28	23.3±2.28	24.8±2.50	
Decision	No significance difference					

Table 4 shows an in-significance difference in post mean score knowledge of synactive theory among nurses working in NICU based on their years of experience except neonates' nurses with  $F_{(df)}=1.251_{(49)}$ , and  $p>0.05$ . Therefore, the null hypothesis which stated that there was no significance difference between post intervention knowledge of nurses based on experience were hereby accepted by this finding for p-value  $>0.05$ .

### Discussion

The outcome of the study shows that the first research question measuring the pre and post intervention knowledge of the participants found that more of the participants (68%) at pre intervention had an average knowledge with a mean score of 18.26 but at post intervention more than half of neonatal nurses (74%) had above average knowledge about synactive theory with a mean score of 23.76, this implies that most of the nurses had average knowledge as a baseline knowledge about the theory. This is in consonance with a study led by Patton, et al (2015) who found that nurses have a little Information about neonatal development and the average knowledge of the participants was based on their clinical experience in the unit as a paediatric nurse. Most would have been familiar with general nursing core care such as assessment of the new-born, maintain patent airway, maintain stable body temperature, protect from infection and injury, provide optimal nutrition, promote parent-infant bonding/attachment and prepare for discharge as identified by Patton, et al (2015).

Meanwhile, after the intervention program another assessment was conducted to justified the effect of the intervention. The result shows an increase in the mean score of the baseline knowledge of nurses towards synactive theory, from the result, most of the participant's level of knowledge was shifted from average to high level of knowledge irrespective of the participants hospitals or years of experience (mean score=23.76) while only 2 of the participants were found with below average knowledge after the intervention. This signifies an increase in the knowledge level of participants on synactive theory with a mean difference of 5.5. This is in line with a study led by Isabelle and Milette (2016) who found that Variables related to the direct and indirect measures of knowledge, increasing significantly after exposure to the training programme. Similarly, Grael, et al (2010) found

that if nurses are trained about save sleep, the risk of sudden death syndrome in neonate will decline. This implies that, more training exercise depicts more skills.

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### Conclusion

This study discovered that, experienced nurses and others in the field shows a high level of interest on developmental care, though the study was limited to nurses working in NICU. The intervention program had been an attractive vehicle to help in better implementation of developmental care practices on neonates. Furthermore, the findings clearly showed that educative programs, has been a key factors to influence nurses knowledge in refining their skills on synactive theory on developmental care practices in the selected hospital, Lagos State, Nigeria.

### Recommendations

Based on the findings of the study, the following recommendations were made:  
The following recommendations were made;

1. Regular educative re-training should be organized to NICU nurses.
2. Consistent training with regular supervision and follow-up should be ensure in the unit
3. Thorough training should be given to senior nurses to boost their confidence in supervising the implementation of the theory.
4. Ministry of health, non-governmental organizations, private hospitals and other bodies should work together to provide layout plan that will allows the implementation of the skills and procedures of the theory.

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