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**INTERNATIONAL JOURNAL OF  
 ADVANCED RESEARCH (IJAR)**

Article DOI:10.21474/IJAR01/9579  
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/9579>



### RESEARCH ARTICLE

#### PROFESSIONAL PERCEPTION ABOUT THE BRAIN ORIENTED CARE IN NICU.

Nandgaonkar Hemant P.<sup>1</sup> and Sanika Gawade<sup>2</sup>.

1. Assistant Professor, Occupational Therapy, Seth GS Medical College, King Edward Memorial Hospital, Mumbai.
2. Occupational Therapist, King Edward Memorial Hospital, Mumbai.

#### Manuscript Info

##### Manuscript History

Received: 16 June 2019  
 Final Accepted: 18 July 2019  
 Published: August 2019

##### Key words:-

Neonatal Therapy, Neurodevelopment, Neonatal Intensive Care Unit, Brain Oriented Care, Neuroprotection, digital approach, phenomenology, perception.

#### Abstract

While implementing the range of developmentally appropriate interventions in neonatal intensive care unit (NICU), there are many challenges. In order to overcome these, digital approach to neurodevelopmental care is proposed. The purpose of the study was to examine the perspective of the professionals about the digital approach in neurodevelopmental care in NICU.

Study Design: Phenomenology, in depth interview

After thematic analysis of the audio recorded interview various themes emerged. The themes represented the both positive aspects and deficiencies of the newer approach. Brain Oriented Care in NICU through INDIA EBUS is perceived as a time saving, organized and useful assistant to the clinical work of neurodevelopmental care in NICU. It will be helpful in guiding, planning, document, analysis implementing, monitoring of the care. Considering the size of the work in this field, it's required to be adopted by each facility on imperative basis.

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#### Introduction:-

Perinatal mortality has radically decreased in recent years. Various factors have been consistently found to be related to morbidity for long term problems occurring in the babies. Few of them are: gestational age, birth weight, sex, premature rupture of membranes, maternal sepsis, and brain white matter injury. The effect of environmental factors on neurodevelopmental outcome has been pointed out. Most studies have focused on family, educational, and economic background but the neonatal intensive care unit (NICU) environment and early practices need more attention than previously granted. (Sizun J, 2004) There is need of interventions that are designed to allow optimal neurobehavioral development of the infant. A variety of approaches are used: control of environmental stressors known to cause physiological and behavioral disorganization—for example, light and sound; scheduling of care giving; integration of parents; specific supportive behavioral techniques such as non-nutritive sucking, opportunities for grasping, swaddling and general motor containment; kangaroo care, neurophysiologically based occupational therapy intervention is found to be useful.

Nevertheless to implement the range of developmentally appropriate interventions, there are many challenges. Few of the challenges are lack of trained manpower, lack of policy, reliance on post discharge intervention, non-individualized neurodevelopmental intervention with the disregard for the neurobehaviour of the baby; lower level

**Corresponding Author:- Nandgaonkar Hemant P.**

Address:- Assistant Professor, Occupational Therapy, Seth GS Medical College, King Edward Memorial Hospital, Mumbai.

of evidence used for decision making. Non uniformity of interventions delivered; deficiency of documentation for the same and others. (Hemant, Neuro Devel Care NICU OT, 2019)

Recently INDIA EBUS is offered as a “Digital Approach to Neurodevelopmental Care in NICU”. INDIA is an acronym for Individual Newborn Developmental Intervention Application. In this approach, Individual intervention is based on the cues given by the baby and aimed at preventing stress on the immature developing brain. Technology is used for reliable, consistent care by all the team members and to facilitate the professional communication in NICU. It has the tagline of “Brain Oriented Care in NICU”. (HP, 2019)

It consists of software and interface training for the professionals. The software is in agreement with the various categories of WHO Digital Health Interventions (WHO, 2018). Interface training includes lecture for the orientation and hands on training to gain mastery over the software. These are conducted at different hospitals.

#### **Aim of the Study:-**

The purpose of the study was to examine the perspective of the professionals about the digital approach in neurodevelopmental care in NICU.

#### **Research team and reflexivity:-**

##### **Personal Characteristics:-**

Interview was conducted by Principal Investigator of Occupational Therapy Training School & Center. Principal investigator is assistant professor and had training in qualitative research. Also conducted some studies with in depth interview and published. PI is male gender, married and has one child.

##### **Relationship with participants:-**

Participants of the study were qualified occupational therapists and had keen interest in neonatal therapy. One was married and mother of two and mother of two and other was unmarried. During initial interaction interviewer was comfortable to the occupational therapists. During an interview, objective of the study was recalled and asked questions as per interview protocol after taking verbal consent. Interview was taken under the pretext that their identity would be safeguarded against any kind of exploitation.

##### **Study design:-**

Phenomenology - underlying assumption was that we can holistically focus in on therapists’ perspectives and opinions. This method will help uncover the meaning of humanly lived phenomena through the analysis of occupational therapists descriptions. With this inductive, descriptive research method we wish to investigate and describe all phenomena, including human experience, in the way these phenomena appear. After discussion of the protocol “Standpoint about the novel approach of practicing Neonatal Therapy”, the interview took place. As it was pilot case study, it was not submitted to Institutional Ethics Committee.

##### **Participant selection:-**

It was convenient sampling method. The participants were approached face-to-face after the training in conference. They were given access to the software for exploration during and after training. During month of July 2019, the conference was held at Mumbai.

##### **Sample size:-**

Total of two participants was part of the study.

##### **Setting:-**

The interview was conducted in the Canteen of Seth GS Medical College to avoid interruption from other staff and students of the department. Sometimes there was interruption from the canteen waiter. We continued audio recording despite this as to continue flow of the interview.

##### **Recruitment criteria:-**

Inclusion Criteria was qualified professionals who had interest and in neurodevelopmental care in NICU. They should be trained to use INDIA EBUS software.

**Data collection:-****Interview guide:**

Following were questions, prompts, guides provided.

1. According to you, what is your opinion about the new software?
2. What are the advantages of the new approach?
3. What do you think are the barrier in implementation?
4. Will it be useful?

The format of the interviews encouraged the participants about any issue that they thought was relevant to the question asked. The questions were not pilot tested before using it during interview.

**Repeat interviews:-**

We carried out one repeat interview. That was during initial period of study. We used play store based mobile Voice recorder for audio taping the interaction. Field notes were made during the interview on the notepad. Each interview lasted for about 45 minutes at the maximum. On an average 20 – 25 min interview was common practice. We did not make transcript as we stored data on the computer and repeatedly listened to it for deriving the codes. Considering the educational level of the participants we did not made transcript and returned to the participants. Data collection was stopped when saturation point was attained.

**Analysis and findings:-****Data analysis:-**

The coding was done by six coders including principal investigators. Total numbers of participants were 2. We derived 57 codes. We prepared themes after coding. Themes were derived from the data and were not identified in advance. Themes comprise of codes consisting of similar message. We used note books and colored pens for analysis. We did involve participants to provide feedback on the findings as we shared the finding with them.

**Table 1:-**Codes for Different Themes

Theme	Codes
Assets	Considered advanced Good option for tedious paper documentation Direction for assessment planning treatment Good for newcomer/ youngster Structured Lot of data Resourceful Detailed evaluation perspective,
Matter	All points which we practice clinically Reminder Organized manner Cover up all the points Lot of information
Creation	INDIA EBUS = Out of the box thinking for integration & summarization of neuroprotective care in NICU. innovation
Hurdles	Lack of vision Lack of leadership “We don’t have the money Lack of curriculum Infrastructure Taking the time to change Facility is not available electronics No demand ...no supply Unawareness amongst professionals.... No policy No documentation Attitudinal

	Marketing
Cutting edge	Present level care is Way back Nothing will be missed 5g ready Ahead of present level technology Languages are useful for clients Will be helpful for communication with parents Eco friendly Techno savvy Mindset of people
Need to take more strides	Policy Awareness Validation by professionals ...useful to them Feedback from the professional .... Need is present...may not know Practice will be helpful to overcoming barrier Positive impact on the society - Team is needed Alexa

In some instances we used participant quotations presented to illustrate the findings without identification. We derived five themes

#### **Assets:-**

This theme describes about the positive aspects about the software and the overall digital approach. It was considered advanced and good option for tedious paper documentation. It was thought that, it gives direction for assessment planning treatment. It was considered very good for newcomer/ youngster because of its structured or Well-thought-out design. It was apparent that it has lot of data and it can create a lot of data for future practice. Also detailed evaluation perspective was appreciated.

#### **Matter:-**

This theme describe about the informational content of the application. It was felt that all points which we practice clinically, it acts as aReminder during practice. It's presented in anorganized manner and Cover up all the points. It was considered of having "Lot of information".

"It is good cognitive aid during practice"

#### **Hurdles:-**

This theme describes the perceived barriers in implementation of the digital approach in neurodevelopmental care in NICU. During conversation it was felt that infrastructure and attitude were the key elements. Infrastructure issues like internet, devices were thought to be major hurdles. Neurodevelopmental care in NICU is itself considered as discretionary facet in present standard of care. There is unawareness amongst the professionals. Lack of policy is also considered an important factor. Very spontaneously it was said that "there is No demand and that's why there is no supply".

#### **Cutting edge:-**

During interview it was perceived that present level of neurodevelopmental care is deficient in many aspects. It was indicated by the statement ".....we are a Way back ". Many aspects are not being practiced but because of the digital approach "Nothing will be missed". Considering the internet speed and buffering during data processing it was noted that this system is "5G ready and Ahead of present level technology". Presently, the application is available in ten languages. This feature is useful for client's education and also will be helpful for communication with parents. Considering the use of paper in present system INDIA EBUS was considered Eco friendly. Also it is a feast for the generation next who are...Techno savvy and who dislikes writing.

"Neurodevelopmental Care in NICU will be efficient if implemented with this new system in correct manner.

#### **Need to take more strides:-**

This theme describes about the necessary actions to be taken to successfully implement it. It will be helpful for integrating the newer practice as a standard of care. It was felt that, policy and awareness is needed on the urgent

basis. As this application is useful to all the stakeholders of the NICU, the validation and feedback from is required from all the professionals. It was clear from the interaction that the need of this facet (Neurodevelopmental care in NICU) is not felt by the professionals or administrators. In this context, necessary actions need to be taken “to feel the need” and have positive impact on the society in the long run. Considering the difficulties faced during the operation of the software, it was suggested that the practice, training and training effect will solve the issue to the large extent.

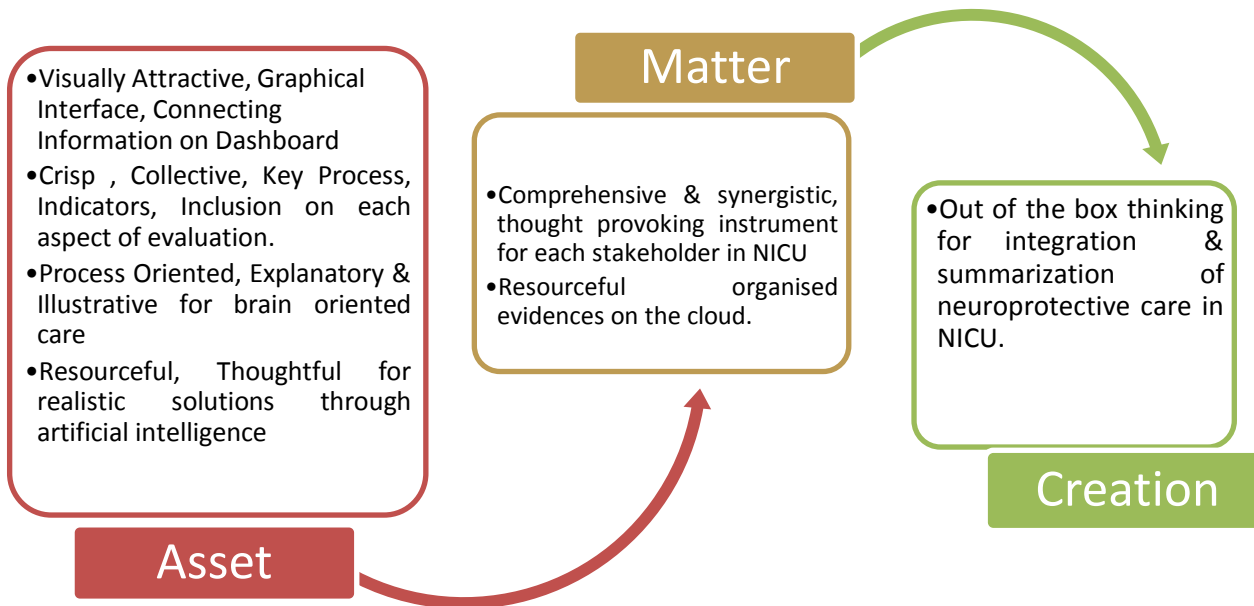


Figure 1:-Qualities of INDIA EBUS

### Discussion:-

The study was taken to understand the professional’s perception about the newer technology introduced for the neurodevelopmental care in NICU. In depth interview was used to understand the perspective after used training.

Many facets appeared through discussion with the participants. The themes represented the both positive aspects and deficiencies of the newer approach.

There are many advantages of the electronic health records. Few of them are Enabling quick access to patient records for more coordinated, efficient care; Securely sharing electronic information with other clinicians; Improving patient and provider interaction and communication, as well as health care convenience; Enabling safer, more reliable prescribing; Helping promote legible, complete documentation; Enhancing privacy and security of patient data; Helping providers improve productivity and many more. During thematic analysis of the interview, we got similar messages. It’s illustrated in the Figure I. It’s evident in the themes viz. cutting edge Matter and Asset. (HealthIT.Gov)

Health care professionals viewed the use of Electronic Health Records (EHR) positively. Health providers felt they provided better care for their patients because of EHR. This research shows the adoption of EHR technology is likely to increase as more medical providers adopt EHR systems. (SelectHUB, 2017) Similar themes appeared during analysis stating “practitioner’s adaptability will change the scenario” and “Neurodevelopmental Care in NICU will be efficient if implemented with the new system in correct manner”.

Different reasons cited in the literature about the non-adoption of new technology in the literature. In the recent newsletter of World Health Organization Dr Garrett Mehl, WHO scientist said that “Digital interventions depend heavily on the context and ensuring appropriate design, - includes structural issues in the settings where they are being used, available infrastructure, the health needs they are trying to address, and the ease of use of the technology itself.” (WHO, WHO releases first guideline on digital health interventions, 2019). Other pointed out as Lack of

vision, Lack of leadership, finances, Infrastructure, Taking the time to change. (Cathie Norris, 2015) During the study it was found that technical infrastructure and attitude were the key barriers. In context of new system introduction and attitude, Phillip also found about perceptions of system users that “.....who were unlikely to accept blame for their own errors or acknowledge their own inadequacies with respect to using the system. When the option is to accept fault yourself or to blame your tools, which would you choose?” (Phillip A. Laplante, 2005). As a solution to this “national collaborative effort involving academics and professionals working together to identify and address the critical issues presented by the emergence of intelligent clinical technologies” (Laplante, 2006). This is true for our area of curiosity which ignored to a large extent. In our study, similar theme emerged as Need to take more strides where policy level effort, awareness and team effort was suggested.

### **Conclusion:-**

Brain Oriented Care in NICU through INDIA EBUS is perceived as a time saving, organized and useful assistant to the clinical work of neurodevelopmental care in NICU. It will be helpful in guiding, planning, document, analysis implementing, monitoring of the care. Considering the size of the work in this field, it's required to be adopted by each facility on imperative basis.

### **Conflict of interest:-**

Sanika declares that she has no conflict of interest. Hemant has equity interest in INDIA EBUS. It may lead to the development of products which may be licensed to company.

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