CHAPTER 8

CONCLUSIONS AND CLINICAL IMPLICATIONS


8.1.1. What is known already: The developmental care interventions to high risk preterm very low birth weight infants have some positive effects on neuro-developmental outcomes. There is considerable heterogeneity in the nature of developmental care interventions. The role and contribution of specific health care discipline in the multidisciplinary developmental supportive care team is not supported with evidence.

8.1.2. What novel information this research thesis adds:

The family centered (maternal administered) early multi-modal sensory stimulation with facilitated movement patterns as part of physical therapy interventions in the developmental care program of high risk infants during NICU stay and beyond at home will have improved neuro-motor developmental outcomes. The developmental assessment tools with good psychometric and clinimetric properties should be used to evaluate changes of motor performance.

8.2. Clinical Implications.

The outcome of this research study provides evidence on the effects of combined role of early sensory stimulation and goal-oriented facilitation of movement patterns as part of developmental care interventions on singleton preterm very low birth weight infants at high risk of developing motor developmental delay. It also provides evidence for the
role and/or contribution of physical therapy interventions in the multidisciplinary developmental supportive care team.

### 8.3. Limitations.

In our study, we had combined various modes of sensory stimulations in context. The tactile stimulation (kangaroo mother care, massage, swaddling) was combined with olfactory/gustatory stimulation (nutritive sucking and non-nutritive suckling), auditory stimulation (soothing music, maternal voice), proprioceptive stimulation (positioning, range of motion activities) and visual stimulation (using bright patterned objects).

Lickliter R (2011) [26] is his review iterates that variations in sensory stimulation will bring about changes in responsiveness not only in that modality but also in other sensory systems as well. Given the limited knowledge of which stimulus interacts with other stimuli and their mutual responsiveness of infants’ integrated sensory organization, the present study could not base the multi-modal sensory stimulation protocol with evidence; further the study could not throw any information of the logical sequence of stimulation using one or more sensory modalities.

In our study the mother-infant dyads were followed up through home visits by social worker to ensure compliance to intervention protocol and to provide psycho-social support. However we have not documented the parental stress associated with parental care of high risk preterm infants during both at NICU and during home visits and/or their satisfaction on social worker interactions with mother which could provide some evidence on the use of home visitation as part of early intervention to mothers to cope parental stress.
In our study we included preterm VLBW intervention and preterm VLBW control group. We have not included full term reference group which would have otherwise provided stronger evidence on the responsiveness of developmental care interventions between the reference and the study group of infants. The research study could not have a preterm VLBW control group with no interventions for ethical considerations. The standards of care and otherwise compensatory increase of mother child interactions in the preterm VLBW control group infants in our study would have reduced the observed differences compared with preterm VLBW intervention group.

Breastfeeding was largely based on infant cues and needs which varies even in the same infant in a day and from infant to infant. Further the mothers were illiterates and of poor socio-economic class. The use of logbooks to record the frequency of nursing was not practically feasible. Therefore the influence of frequency and duration of breastfeeding on improvements of weight and length is not known and was not documented which could be one limitations.

The infants were followed up once monthly until four months corrected age. The repeat measures of secondary outcome variables such as weight gain, length gain, head circumference and ponderal index following baseline measure were not taken during monthly follow up. The repeat measurements would have provided additional statistical information on differential patterns of growth variables (if any) among the preterm VLBW intervention and control groups.

The effect of multi-modal sensory stimulation influencing the length of hospital stay could not be ascertained. The mean length of hospital stay of intervention and control
group subjects are 1.13 and 1.58 days respectively. However, the difference in means were not statistically analyzed. The interventions were carried out in a Government General Hospital. The discharge to home was influenced by many factors that includes the socio-economic status of the family and limited number of availability of NICU beds against the admissions.

Our study did not include blinding of the evaluator in the study design. The investigators during study design included single blinding of the evaluator for the subjects. The review committee had the opinion that such strict blinding of subjects would not be possible since the investigator could also ascertain the subjects being allocated to groups informally from the mother of the child. The blinding of the subjects could have limited potential researcher bias.

8.4. Future directions.

The future research should consider larger sample of high risk infants drawn from multi-centric trial to evaluate the effectiveness of physical therapy interventions as part of developmental supportive care program to high risk infants. In future studies, the addition of full term reference group in the clinical trial will help to evaluate and overcome the effects of compensatory mother-child interactions in high risk preterm control groups. The evidence on spatial and temporal parameters of multi-modal sensory stimulation should be given significant importance while evolving the interventional protocol in developmental supportive care program.
8.5. Conclusion.

The early physical therapy interventions (using multi-modal sensory stimulation and facilitation of movement pattern techniques) on singleton preterm very low birth weight infants has positive effects in improving motor outcomes of high risk infants at risk of developing motor developmental delay.