Chapter - 6
SUMMARY AND CONCLUSION

The existence of a profusion of myths and superstitions has probably inhibited until modern scientific thought and investigation into maternal-child relationship. At the turn of this century investigators have just begun to graze the surface of the complex and dynamic interface between the pregnant woman and her fetus. The influence of maternal psychological function and social interaction on domain of infant development and well being has long been subjects of scrutiny. However the maternal influences exerted prior to birth have the potential to be more profound and pervasive because the intrauterine milieu is subject directly to neuroendocrine influences of the maternal emotions. The effects of maternal emotional state on the fetus has long been a source of speculation and anecdote, dating back to biblical literary references.

Child Development was previously thought to be a field of study from the time the child is born that is “birth” was considered as the starting point from where the study begins. Most of the factors influencing the child’s
behaviour was studied in depth but there was less focus on the impact of the prenatal influences especially like that of the maternal factors like maternal stress and maternal expectations. There are studies showing the impact of maternal stress and other factors during the pregnancy stage on the infant born. Small variations in the fetal physiological environment induced by internal or external factors can be of critical and long lasting importance given as increased sensitivity of the rapidly developing brain. This calls for the need of a shift in a paradigm in infant studies from postnatal to prenatal determinants of development.

Neonatal stage being the first stage to begin with postnatal study, the influence of the prenatal factors is considered to be only prominent in the this stage since the stage is too early for the impact of the environmental, social and other postnatal factors. Hence it can be believed that at this stage what ever the child is exhibiting is what has been acquired during the prenatal period. This explains the importance of the neonatal stage for the study of the prenatal factors.

Neonates are reacting involuntarily through reflex behaviour. The presence or absence of reflexes is a guide to evaluating neurological development, since there is a definite timetable for the development and
dropping out of most reflexes (Taw 1990) The difference in exhibiting the reflexes is also surprising and is an area where not much research has been done.

Neonatal reflexes are of great importance as it is the sign of the neurological state and it is also the first responses the human infant exhibits. Since it also reveals the state of the central nervous system of the infant, study of the reflexes and the factors influencing it, is an area where not much effort has been seen. Though it is known that harmful events during delivery and mode of delivery explain small proportions of disorders in child behavior and development and prenatal factors and their presumed programming effects on the fetal brain have been incriminated to play a role in developmental psychology, however prospective studies on the possible involvement of prenatal factors like maternal stress, maternal expectation, gestation period, perinatal factors like mode of delivery and post natal like maternal acceptance on neonatal reflexes are almost lacking in the fields of child psychiatry and developmental psychology.

Cross culture study is of great importance to study the maternal factors hence this study explores in two different settings to study the reflexes that is in Bahrain and in kerala.
6.1 The problem for investigation

A study on responses of Neonates of Kerala and Gulf Countries with reference to Maternal Stress, Expectation, Acceptance, Gestation period, Mode of Delivery and Gender

6.2 Objectives

The present study has set up different objectives of the present investigations are as follows.

6.2.1 To find out the relationship between maternal stress and reflexes of neonates born in Kerala and Bahrain and to make comparison between two.

6.2.2 To find out the relationship between maternal Expectation and reflexes of neonates born in Kerala and Bahrain and to make a comparison between the two.

6.2.3 To find out the relationship between Maternal Acceptance and reflexes of neonates born in Kerala and Bahrain and to make comparison between the two.
6.2.4 To compare neonatal reflexes born in Kerala and Bahrain with reference to mode of delivery, gestation period and gender.

6.2.5 To compare the maternal factors like Maternal Stress, Maternal Expectation and Maternal Acceptance between the Kerala and Bahrain mothers.

6.2.6 To find out the inter relationship between Maternal stress and expectation.

6.2.7 To find out the inter relationship between Maternal expectation and acceptance.

6.3 Hypotheses

The following hypotheses are formulated to conduct the study.

6.3.1 There will be significant correlation between Neonatal reflexes with regard to

(v) Maternal Stress

(vi) Maternal Expectation

(vii) Maternal Acceptance

(viii) Birth Weight of neonates
6.3.2 There will be significant correlation between Maternal stress with regard to

(iv) Maternal Expectation

(v) Maternal Acceptance

(vi) Birth Weight of neonates

6.3.3 There will be significant correlation between Maternal expectation with

(iii) Maternal Acceptance

(iv) Birth weight of neonates.

6.3.4 There will be significant correlation between Birth weight and Maternal Acceptance

6.3.5 There will be significant difference with regard to the neonatal reflexes of

(vi) Preterm and Term neonate

(vii) Male and Female Neonate

(viii) Kerala and Bahrain Caesarean delivered neonates.

(ix) Kerala and Bahrain Normal delivered neonates
(x) Cesarean and Normal delivered Neonates.

6.3.6 There will be significant difference in maternal stress of Kerala and Bahrain Expectant mothers.

6.3.7 There will be significant difference in Maternal Expectation of Kerala and Bahrain Expectant mothers.

6.3.8 There will be significant difference in maternal acceptance of the Kerala and Bahrain mothers.

6.4 Definitions of Concepts

Concepts used in the study are explained as follows.

6.4.1. Neonate

The new born babies of one to three days old are termed as neonate in the present study.

6.4.2. Neonatal Reflexes

The Neonatal Reflexes like grasping, babinski and rooting reflexes are termed as the neonatal reflexes in the present study.
6.4.2.1. Babinski reflex

The Babinski reflex is characterized by a fanning out of all five toes and the stretching forward of the big toe when the bottom of the foot is stroked or tickled.

6.4.2.2. Grasping Reflex

The grasping reflex is characterized by the grasping of an object that is placed crosswise on the palm of a newborn infant or neonate. It is a sign of normal neurological development.

6.4.2.3. Rooting Reflex

When a neonate's cheek is touched or stroked it will respond automatically by turning head toward that side.

6.4.3. Maternal stress

Maternal stress is any circumstances that thereafter or is perceived to threaten the pregnant mothers well being and that there by tax one's coping abilities.
6.4.4. Maternal Expectations

The Expectant mother’s prediction and Expectation of the child to be born is termed as Maternal Expectation in the present study. The psychological prediction, strictly speaking means forecasting the probability of the personality intelligence, affection and mother child relationship of the expectant mothers.

6.4.5. Maternal Acceptance

Maternal Acceptance in the present study is considered as the positive take in of the mother after the childbirth to the existing situation, adapting to the change occurred in the life with the birth of the child and adapting the child as itself.

6.4.6. Gestation Period

Gestation period is the period from the day of the mother’s conception to the birth of the baby. In the present study term neonates are referred to the neonates those who are born after nine months and nine days. Preterm Neonates refers to those who have less Gestation period than the term neonates or born between eight and nine months.
6.4.7. Mode of delivery

Mode of delivery is the means the method of delivery by which the baby is born. In the present study normal delivery referred is through the vaginal path and caesarean delivery referred is through the surgical method.

6.4.8. Birth weight

Weight of the child at first 15 minutes after birth is referred as birth weight

6.5. The Sample

In the present study sample comprised of three hundred and sixty Neonates in the age range of 1-3 days. The Neonates were related using the purposive sampling method. Their respective mothers were also considered as samples for obtaining the part of the data.

The area of selecting the Neonates and mothers in the sample was as follows. In Kerala Waynad, Ernakulam and Thiruvananthapuram districts were selected for the study because they represented the northern, central and Southern regions of Kerala. Similarly Muharaqu, Salmbadh, Salmaniya and Naim districts were selected for the study in Bahrain as it covers the entire region.
Healthy neonates of 1-3 days were selected after the consultancy and permission taken from the doctor or Neonatologist. Expectant mothers of the age group of 19-30 were selected by the purposive sampling method. The age group of 19-30 is considered the age for healthy period for child bearing.

Out of 360 neonates 120 were born in Bahrain and 240 Kerala. Out of 120 Neonates born in Bahrain 60 were caesareans delivered and 60 Normal delivered including both the gender in equal proportions. Similarly from 240 Neonates born in Kerala 120 were term Neonates and 60 normal delivered including both the gender. Out of 120 preterm Neonates 60 were females and 60 term males were selected. Neonates were of normal birth weight with Apgar scores at 5 minutes well within the normal range of 8 or higher. Neonates with any known medical problems were eliminated from the study. Mothers of the 360 selected Neonates were considered for studying maternal stress, expectation and Acceptance.
6.6. **The Tools**

For collection of the data the following tools were used in the present study.

**Tool 1: Maternal stress scale- Questionnaire**

For measuring the maternal stress a rating scale in the form of questionnaire is modified from the Hamilton Anxiety Rating Scale (1959) by the investigator.

**Tool 2: Maternal Expectation scale**

For assessing the maternal expectation of the expectant mothers a questionnaire is constructed by the investigator.

**Tool 3: Maternal Acceptance Scale**

To assess the acceptance of mothers after the delivery a questionnaire is constructed by the investigator.

**Tool 4: Neonatal Reflexes Test**

For studying the Neonatal Reflexes, a Neonatal Reflex test is modified from Brazeltons scale by the investigator.
Tool 5: General Information Sheet:

1. General Information sheet consist of questions concerning the name, place name, date of birth, age and occupation of the expectant mothers.

2. To get the details of the mode of delivery, gestation period, birth weight, gender, and name of Neonate, a Performa was prepared which is filled by the Nurse or by the consultant doctors.

6.7. Collection of Data for the Main Study

Data was collected in three sessions

Session 1

The two questionnaire is Maternal stress scale and Maternal Expectation scale where given to the expectant mothers during the last trimester of pregnancy when they visited their doctor. No time limit was set for responding. They were allowed to take the questionnaire home and bring it duly filled in the next visit to the hospital. It was not easy to collect questionnaire duly filled from expectant mothers for most of them either forget to bring it or were not prompt in visiting the hospital.

All the closed responses in (420 X 2) completed questionnaires were scored as indicated in the scoring reference in the tools though the
questionnaire for Maternal stress scale and Maternal Expectation Scale was collected together the scoring was done separately for Maternal stress and Maternal Expectation scale.

Session 2

To administer the Neonatal Reflex test special Care was taken by the investigator with a help of a nurse. The test is conducted in a room, which is devoid of disturbances from outside and other stimuli that would distract the neonate. The hospital nurses brought the neonates to the observation room where the study was conducted.

The following procedures were adopted for all the neonates by the investigator irrespective of term period, gender and mode of delivery of the neonates. The experiment consists of giving stimulation and to get the specific reflect action and to observe the time taken to exhibit the reflexes.

For observation of each reflex, three trials are carried out with the time gap of 5 minutes between the trials. After a period of 10 minutes stimulation for the next reflex action is given. The procedures carried out in the same way for all the four reflex action under study.
The investigation consists of three experiments being conducted to study a single reflex action.

(i) Babinski Reflex (Experiment No.1)

A soft fiber rod is used throughout the study to stimulate by stroking the sole of the foot. The left sole is given a stroke first and after an interval of 5 minutes the right sole is stroked. The time taken to fan the toes and twist the foot is noted with the help of a timer in the observation schedule.

(ii) Grasping Reflex (Experiment No II)

The same soft fiber rod is used throughout the study to stimulate by touching the palm of the neonates. The time taken by the neonates to grasp the rod is recorded in the observation schedule with the help of times. The left palm is stimulated first and after an interval of 5 minutes the right palm is stimulated.

(iii) Rooting Reflex (Experiment No: III)

The same soft fiber rod is used throughout the study to stimulate by stroking the cheeks softly. The time taken to turn head and open mouth by the child is noted with the help of the timer, is recorded in the observation schedule.
The responses of Neonates recorded in Seconds for each reflexes of three trials are taken and the average of the three trials of each reflexes are added and considered as the score for each neonate.

Session 3

The third Session of the main study was conducted at the hospital. The mother after the delivery is approached again. The schedule of testing was informed to them through the consultant doctors. The subjects were provided with the maternal acceptance scale and were asked to furnish the particulars called for in the scale. Then, they were asked to go through the instructions printed at the beginning of the test. After they finished reading the instructions the investigator once again read the same instructions and emphasized the need for answering the questions truthfully. Then they were asked to answer the questions by ticking or encircling against each question. In case of doubts, the investigator explained the question without projecting her views. The questionnaire was collected back on the same day.

All the responses in completed questionnaire of the selected sample of 360 delivered mothers were scored as indicated in the scoring reference of the tools.
6.8 Treatment of data

Pearson's product moment correlation was used to find the correlation between the variables in the present study.

Paired Sample "t" test is used to find the differences of the variables and samples in the present study.

The formula employed for calculation of Pearson's co-efficient of correlation was

\[ r = \frac{\sum(x - \bar{x}) (y - \bar{y})}{n \sigma_x \sigma_y} \]

The formula employed for calculation of "t" test is

\[ t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s^2}{n_1} + \frac{s^2}{n_2}}} \]
6.9 Results

Results of the present study are as follows:

6.9.1 There is a significant correlation between neonatal reflexes with maternal stress ($r = 0.46$, $p < 0.0001$). The study also shows that it is correlated significantly and positively with reflexes of preterm, normal delivered and caesarean delivered neonates born in Kerala and Bahrain.

6.9.2 There is no significant relation between Neonatal reflexes with

(a) Maternal expectation ($r = 0.15$, $p > 0.5$) It is also found that Maternal expectation is not related to the reflexes of pre-term, normal delivered and caesarean delivered term Neonates born in Kerala and Bahrain.

(b) Maternal acceptance. It also shows that maternal acceptance is not related to the reflexes of term, pre-term, normal delivered and caesarean delivered Neonates born in Kerala and Bahrain. Term ($r = -0.03$, $p > 0.67$)

Pre-term ($r = -0.06$, $p > 0.5$) Normal delivered ($r = -0.01$, $p > 0.5$) and caesarean delivered Neonates ($r = -0.011$, $p > 0.5$).

(c) Birth Weight of neonates ($r = 0.09$, $p < 0.001$)
6.9.3 There is significant correlation between Maternal stress

   a) Maternal expectation ( $r = 0.26$, $p < 0.001$)

   b) Birth weight of the Neonates ( $r = 0.62$, $P < 0.0001$)

6.9.4 There is no significant co-relation between Maternal acceptance

   a. Maternal stress ( $r = -0.12$, $p > 0.05$)

   b. Maternal expectation ( $r = 0.12$, $P > 0.05$)

   c. Birth Weight of the Neonates ( $r = 0.12$, $p > 0.05$)

6.9.5 There is significant co-relation between Birth weight of the Neonates and Maternal expectation ( $r = 0.11$, $p < 0.001$)

6.9.6 There is significant difference in the Reflexes between

   a) Kerala and Bahrain Term Neonates ( ‘t’ value = 4.444, $P < 0.0001$)

   b) Kerala and Bahrain Normal delivered Term Neonates ( ‘t’ value=1.03, $P < 0.3050$)

   c) Kerala and Bahrain caesarean delivered Term Neonates
      (‘t’ value=5.13, $P < 0.001$)
d) Term and Preterm normal delivered Neonates born in Kerala (‘t’ value = 5.76, P < 0.01)

e) Term and Preterm caesarean delivered Neonates born in Kerala (‘t’ value = 6.19, P < 0.01)

f) Caesarean and Normal delivered term neonates of Kerala and Bahrain (‘t’ value = -5.61, P < 0.0001)

g) Caesarean and Normal delivered, term neonates of Kerala (‘t’ value = 1.99, P < 0.0001)

h) Caesarean and Normal delivered term Neonates of Bahrain (‘t’ value = 6.16, P < 0.0001)

i) Caesarean and Normal delivered Pre-term Neonates of Kerala (‘t’ value = 6.15, P < 0.0001)

6.9.7 There is no significant difference between

a) Male and Female term Neonates of Bahrain and Kerala in exhibiting the Neonatal reflexes (‘t’ value = 2.222, P > 0.5 N.S)

b) Male and Female term Neonates of Bahrain (‘t’ value = 2.83, P > 0.5 N.S)
c) Male and Female normal delivered term Neonates of Baharin

('t' value = 0.69, P>0.5 N.S)

d) Male and female caesarean delivered term Neonates of Baharin

('t' value = 5.88, P>0.5 N.S)

e) Male and Female term Neonates of Kerala ('t' value = 0.62, P>0.5 N.S)

f) Male and female normal delivered term Neonates born in Kerala

('t' value = 1.76, P>0.5 N.S)

g) Male and Female caesarean delivered term Neonates born in Kerala

('t' value = 0.46, P>0.5 N.S)

h) Male and female normal delivered preterm neonates born in Kerala

('t' value = 0.43, P>0.5 N.S)

i) Male and female caesarean delivered preterm neonates born in Kerala

('t' value = 0.44, P>0.5 N.S)

6.9.8 There is no significant difference found between

d) Maternal stress of Bahrain and Kerala term Neonates ('t' value = -0.83, P>0.5 N.S)
e) Maternal expectation of Bahrain and Kerala term Neonates (‘t’ value = 0.058, P>0.5 N.S)

f) Maternal acceptance of Bahrain and Kerala term Neonates (‘t’ value = 0.50, P>0.5 N.S)

6.10 CONCLUSIONS

6.10.1 There is a positive relation between Maternal stress and Neonatal reflex, the more is the maternal stress the neonates takes more time in exhibiting the reflexes.

6.10.2 Maternal expectation is not found to be related to the reflex of the Neonates.

6.10.3 Post natal Maternal factors like Maternal acceptance in the present study is not related to the Neonatal reflexes.

6.10.4 Birth weight does not affect the Neonatal reflexes.

6.10.5 There is a positive relation between maternal stress and maternal expectation. The expectation has effect on the stress as more expectation makes the mothers more stressed.
6.10.6 Maternal expectation is not related to the Maternal acceptance. The mothers accepted to the situation once the child is born whatever their expectation was.

6.10.7 Maternal stress has effect on the birth weight of the Neonates. Mother's with higher Maternal stress gave birth to lower birth weight Neonates.

6.10.8 Maternal expectation effects the birth weight. Higher Maternal expectation has been found to be a factor for low birth weight.

6.10.9 There is no relation between Maternal acceptance and birth weight.

6.10.10 The caesarean delivered term Neonates of Bahrain took more time to exhibit the reflexes compared to the Kerala counter parts whereas there was no difference between the normal delivered term Neonates born in Bahrain and Kerala.

6.10.11 Gestation period is a factor influencing the neonatal reflexes. The pre-term neonates took more time when compared to the term neonates in exhibiting the reflexes.

6.10.12 Mode of delivery in general is found to affect the neonatal reflexes. The caesarean delivered neonates took more time in exhibiting the
reflexes irrespective of the gestation period that is the term and the
pre-term showed a mark difference when they were delivered by the
caesarean section.

6.10.13 Gender was found to have no affect on the reflexes irrespective of
the gestation period, mode of delivery, birth weight or the culture
whether it is in Bahrain or in Kerala hence it can be concluded that
gender is not a factor influencing the reflexes

6.10.14 Maternal factors like Maternal stress, Maternal expectations and
Maternal acceptance showed no significant difference hence it can
be concluded that the culture Kerala and Bahrain has no impact on
the Maternal factors and such variables are purely individualistic.

6.11. Problems faced by the Investigator

Since the subject of study was neonates, it was very difficult for the
investigator to convince the parents and some times even the hospital
authorities to conduct the study. One hospital in Trivandrum insisted that
the study should be conducted only in the front of the parents. Initially the
preterm neonates were also considered in the sample from Bahrain but it was
not possible to get the permission to study the preterm. The study was cross
sectional and since most of the expectant mothers of Bahrain did not speak English the investigator confronted some difficulties while communicating with them.

It was not easy to collect questionnaire duly filled from expectant mothers for most of them either forget to bring it or were not prompt in visiting the hospital. The percentage of return of the questionnaire was very low in spite of the continuous and constant persuasion of the investigator throughout the session. As a result out of 950 questionnaires distributed in all the selected hospitals only 420 were returned duly filled.

Since there were two samples to be studied that is the mothers and their respective neonates, due to the early delivery or unpredictable dates of delivery the investigator found it difficult to get the neonate sample. Another problem was that of getting equal number of neonates with regard to gestation period, mode of delivery, gender from Kerala and Bahrain. And these factors made the study time consuming.

Another difficulty faced by the investigator was due to the lack of earlier studies it gave a hard time to the investigator in collecting the literature.
6.12. Suggestion and General recommendation for Further Research

The present study gives room for a number of related researches on neonates, how the reflexes differs and what are the causes for the difference exhibited by them. Prenatal factors other than Maternal stress and expectation can be studied to see the influence on the reflexes. Medical science can take over this area to see the affect of medicines given to the pregnant women and how it affects the neonates in respect to the reflexes exhibited. Mode of delivery and its impact on the Neonates especially the reflexes also can be studied elaborately in the medical science.

Since this study is a cross cultural study including Bahrain and Kerala, it is recommended that more different cultures should be taken in to account for further studies. A long term study to see the affect of Neonatal reflexes on the later development is also recommended to emphasize the importance of Neonatal reflexes. A similar study could be conducted with large sample in order to get more authenticity for the results.

6.12. Implication of the present study

The present study highlights the prenatal and perinatal factors influencing the neonatal reflexes. Maternal stress, gestation period and
mode of delivery influence the neonatal reflexes. Since it was a cross
culture study it also shows the difference in the reflexes shown by the
caesarean delivered neonates of Bahrain and Kerala whereas there was no
difference in the reflexes shown by the normal delivered neonates. Hence it
can be concluded that culture has no effect if the child is born by the normal
delivery. The finding of the present study may raise doubts about the
increasing number of caesarean sections performed for convenience for the
mother and in some private hospitals the management insists on caesarean
delivery to the gynecologists for their profit. Thus through this study the
investigator urgently calls the attention of especially the gynecologists and
the mothers who don’t give second thought about caesarean delivery when it
is not essential.

Maternal Factors like stress, acceptance and expectation when
compared between the mothers of Bahrain and Kerala showed no significant
difference, hence these factors are purely individual and the culture has no
influence. Maternal stress and its relation to neonates is an area, which can
help the parents to be. The relationship between the neonates and maternal
factor can bring out more novel information for the counselors, parents and
all those who deal with children. The effect of gestation period on neonatal
responses can help the gynecologists, pediatricians, neonatologist and mothers to know more about the influences of the same. It is important for health care providers to better understand the impact of maternal stress and its outcomes. Hence this investigation will be of immense help for the Expectant mothers.