Chapter 7

SUMMARY
AND
CONCLUSION
(Recommendations)
SUMMARY
The present study is a longitudinal study which has been carried over a period of two years covering urban children with the aim to obtain empirical information about growth and development during the first two years of life. A sample of 350 children was selected randomly and followed every 3 months for a period of 2 years for study of Growth and Development pattern amongst Kashmiri children. Weight and Crown Heal Length were recorded for growth assessment and various items of developmental milestones as described under DDST II were carried out to assess development of children under study. The final analysis has been made on 194 children who complied throughout the study and had a regular follow up.

The main findings of the study have been summarized under three main headings.

A. General Characteristics
B. Growth
C. Development

A) General Characteristics

The general characteristics of families of the children under study showed that the mean age of mothers was 27.97 years and that of fathers was 31.82 years. Majority of the mothers were in 25-30 years age group and maximum fathers were in 30-35 years age group. 57.7% of mothers of the sample group were matriculates and above compared to 80.9% fathers. 52.4% fathers were either class III employees or doing...
business while as 78.9% mothers were housewives. 49% of families had income of 86,000 or more per annum.

Majority of children (64.9%) belonged to first or second birth order and 60.8% of children were born within 3 years of previous birth. 90.7% of children were born in hospital and 84.6% were delivered by doctors. Majority (95.8%) were full term babies.

52.6% of these children were exclusively breast fed while 46.9% had received mixed feeds. 83% had been weaned between 4 to 6 months after birth and 17% had delayed weaning. 91.7% were completely immunized. Majority of children had not suffered any prolonged or serious illness likely to influence growth or development.

B) Growth

The average weight of new born (around birth) was 2.97 ± 0.49 kgs and the average CHL was 49.17 ± 3.17 cms. The assessment of weight and CHL at quarterly intervals during first and second year revealed that the overall weight and CHL of children at 6 months was 6.48 ± 1.05 kgs and 62.64 ± 4.37 cms respectively. At 12th month it was 8.72 ± 1.31 kgs and 71.71 ± 4.38 cms respectively thus confirming the fact that weight of children had doubled by 6 months and tripled by 12 months of age. However, with respect to CHL there was only 46% (45.84%) increase up to 12 months from the base value (birth value).

The second year of life in the present study shows that mean weight and CHL at 18 months was 10.21 ± 1.53 kgs and 78.54 ± 4.32 cms respectively. At 24th months the values were 11.29 ± 1.59 kgs and 82.70 ± 4.21 cms for weight and CHL respectively. These values were almost comparable to national averages reported by NIN and were better than ICMR. Thus a 4 fold increase (quadruple effect) of weight change was seen by 24 months of age though CHL showed only 68.19% increase from the base value (birth value) in comparison to usual 75% increase reported in various standards.
The rate of growth for weight parameter was very fast i.e., 87.83% in first three months. Thereafter, there is a steady slowing down of growth in the next six months ranging between 18.67% to 13.39% which in the second year of life shows further slowing at a consistent rate. Similar pattern of growth rate increase is seen for crown heal length.

Comparison of different percentile values of Weight and CHL with NCHS and AIIMS standards have revealed that the values in the present study at birth fall below NCHS for both boys and girls and continue to remain throughout the first and second year of life and the overall values correspond roughly to 25th percentile of NCHS values. The percentile values of weight once compared to the values of north Indian children (upper SES computed at AIIMS) show that the children in present study were initially lower to AIIMS percentile values up to six months of age but then the gap narrowed by 12 months of age and thereafter even overshoot in the last six months of second year for weight The percentile value for CHL once compared to the values of North-Indian children (upper SES computed at AIIMS) did not show any consistent pattern in the first three months but thereafter shows a similar pattern as was seen for weight showing thereby that our children have the potential to catch up under favorable environment

The growth of children in relation to various socio-medical factors showed that the mean weight and CHL among male and female children had a significant difference during first nine months of life with males having better mean weight and CHL compared to their counter parts. However, this difference was minimal at 12 months of age and from 15 months of age there was no significant difference in the weight and CHL. Even the percentile values showed similar pattern which was more evident in respect of CHL than weight in children.
In respect of feeding and weaning it was seen that there is clear cut difference in the weight and CHL at 12th and 24th months of age. The weight was definitely better amongst children who were exclusively breast fed compared to children who were on mixed feeding in the first year. It was interesting to note that the majority of children (83%) had been weaned normally. Weight and CHL at 12th and 24th months was significantly better amongst children weaned appropriately (6 to 9 months) compared to children with delayed weaning.

The growth in relation to literacy status of mothers has shown a significant difference in the weight and CHL at 12th and 24th months of age. The mean weight and CHL being better in case of children born to literate mothers than with those of children born to illiterate mothers.

The child’s growth in relationship to family income showed that weight and CHL at the end of first year had lower mean values for children belonging to low income group in comparison to children belonging to high income group. Similar pattern was also observed at the end of 24 months age. The differences at the end of second year were more conspicuous rather than at the end of first year.

Even the birth order of the child has shown significant effect on the weight and CHL at the end of first and second year of life. The first and second born child being advantageous of having better weight and CHL as compared to babies with higher birth order. In respect of birth spacing, weight and CHL of children who’s mother had practiced spacing > 3 years was significantly better that the children who’s mothers gave birth to another baby within 3 years.

The growth of the children belonging to housewives showed significantly lower weight and CHL at 12th month and 24th months of age in comparison to children belonging to working mothers.
C) Development

The present study has also analyzed various developmental milestones of children under four major groups e.g. Gross Motor, Fine Motor, Language and Socio-personal. In Language 15 items, Under Gross-Motor 20 items, under Fine-motor 13 items, and in respect of Socio-personal 16 items were studied.

In gross-motor development, it was observed that the age of attainment of milestones was definitely late than the age of attaining the same milestones under Denver Development Screening Test (DDST). The usual age of ‘lifting head’ for a short span of time in first month viz., .78 ± .23 months and keeping ‘head steady’ at 3.97 ± .79 months was comparable to the reported Indian figures of 1-2 months and 4 months respectively. In respect of ‘sitting without support’ the age of achievement i.e. 6.83 ± 1.17 months compared well with WHO-ICMR study and ‘standing without support’ at the age of 12.31 ± 1.50 months was also comparable to WHO-ICMR study.

On the whole, average age for attainment of Gross-Motor milestones were comparable to the age of attainment of milestones reported by PBST. It was interesting to note that various gross motor milestones attained in the present study during second year of life were more close to PBST values than the milestones achieved in the first year of life.

Comparing the fine-motor milestones of the present study with DDST, it was again seen that our children attained most of the milestones little late than the ages reported in DDST and the mean age of attainment being almost similar to PBST values. However, the difference in the mean ages were not as obvious as under Gross-Motor milestones. The attempt to ‘Grasp rattle’ was at 4.06 ± 1.26 compared to 3.5 months and ‘reaching an object’ was at 4.73 ± 1.24 months compared to 4 months. In case of attempt to ‘scribble’ there was great age difference in attainment age i.e., our children scribbled at 16.5 ± 3.51 months compared to age of 13.5 months.
With regard to socio-personal development, our children attained milestones quite late in comparison to DDST but the ages still correspond to average age of attainment under PBST. Studies at AIIMS well baby clinic have shown that infants ‘regards face’ by one month and gave ‘social smile’ at the end of second month, which is comparable to the average age of our children. In case of ‘imitating activities’ our children are slightly late (14.6 ± 2.02 months) compared to children from AIIMS (12 months).

In respect of language milestones, the average age of attainment for different items appearing during first 12 -15 months showed definite delay in our children when compared with Indian studies. During second year of life most of the language milestones are comparable with the average ages seen amongst Baroda children. Once compared with western standards, there is no uniform pattern, some items are attained at earlier age whereas others are delayed. Our children ‘vocalized’ at 1.72 ± .44 months as compared to 1.4 months, ‘turn head to rattle sound’ by 4.24 ± 1.29 months in comparison to 3.9 months as reported by Phatak. In case of saying ‘Dada-Mama’ our children achieve this milestone by 10.79 ± 1.53 months as compared to 9 months and utter two words by 15.04 months in comparison to 14 months.

Comparison of 3rd and 97th percentiles values on various items of development with that of mean age values of 3rd and 97th percentiles reported by Simplified Baroda Development Screening Test popularly known as TDSC showed that there is a mixed pattern of age range for some of the items. Our children had similar pattern of (3rd and 97th) percentile values for different items attained up to first 6 months and thereafter there was a difference in age for attaining these development milestones. In some items our children are early starters showing thereby an age shift to the left while in other developmental items, our children are late starters and there by an age shift to the right.
The age at which a given percent of population can pass an item showed large variation for their attainment in the present study. When compared to one of the Western study Frankenburng it was observed that in certain items the age at which 25% of our children could pass an item, at the same age comparatively 75% to 90% of Western children could pass these items, thereby confirming that our children definitely attain milestones at a later age than Western children. In few items one could see that the age at which 50% of our children had passed a test, it corresponded to the age at which 90% of the Western pattern could pass the same test. For some items even though in the initial few months, percentage of children passing a particular item at a given age was comparable to Western study, yet later on it took them more time in terms of age to attain the next item.

The data further gives a rough pattern of group differences revealing that if the mean age of passing 25 percent children verses 75 percent passing is compared from our study with that of Western study, a difference of one month to one and a half month age could be observed in the items attained in first year and the difference goes to 2 months in items attained in next 6 –12 months and nearly reached to 2-3 months for rest other items.

The data was further analyzed in relation to various socio-medical variables, to see if there is any impact of these factors on the average age of attainment of randomly chosen few developmental milestones from Gross-Motor, Fine Motor, Language and Socio-personal groups.

At the outset it was seen that the males in most of the ‘Gross motor’ milestone were early attainder than females although only 2 milestones were statistically significant i.e. ‘chest-up-arm support’ and ‘kicking of ball forward’. With regard to ‘language’ and ‘socio-personal’ milestones girls were early attainder but the difference did not prove to be significant statistically. However, in case of ‘fine motor’ milestones
males achieved some items i.e., ‘reaching objects’, ‘regarding raisin’, ‘taking raisin’ and ‘dumping raisin’ earlier than the females, while as females were early attainers with respect to ‘grasping rattle’, ‘hands together’, ‘passing cube’, ‘thumb finger grasp’, ‘scribbling’ and ‘looking for yarn’. But these differences were insignificant.

With regard to literacy status of mother it was found that children of literate mothers had attained various Gross Motor, Fine Motor, Language and Socio-personal milestones earlier than the children of illiterate mothers. The differences in the mean values were significant except for items like ‘kicking ball forward’, ‘drinking from cup’ and ‘using spoon’.

In relation to feeding and weaning it was interesting to note that children whether breast fed or artificially fed had no difference in attaining the milestones. However, those weaned at an appropriate age (6-9 months) had attained milestones earlier than those who had delayed weaning and these difference were significant statistically except for the item ‘drinking from cup’, where the difference was insignificant, although the children with appropriate weaning age did attain the milestone earlier.

The children belonging to working mothers showed mean age of attainment of some of the milestones significantly earlier, whereas other items were attained little later. The significantly different items attained earlier were ‘Standing Momentarily’, ‘Walking Well’, ‘Laughing’, ‘Turning To Voice’, ‘Dada Mama’, ‘Grasping Rattle’, ‘Hands Together’ and ‘Feeding Self’ and others were insignificantly different. Although most of the items were attained earlier by children of working mothers.

In relation to birth order it was mainly the ‘motor milestone’ and the ‘socio-personal’ milestones which showed significantly earlier mean age of attainment amongst the first and second birth order compared to the later birth orders.
The birth weight had significant impact on attainment of most of the milestones especially in children born with > 2.8 kgs of birth weight whose age of attainment was much earlier than children born with birth weight < 2.8 kgs and the maximum delay in attainment of various milestones was among the children with weight < 2.5 kgs.

Further, it was observed that income did not play any significant role in achieving various developmental milestones. The mean ages between different income groups with respect to attainment of ‘Gross-Motor’, ‘Fine-Motor’, ‘Language’ and ‘Socio-Personal’ development were hardly different to each other.
CONCLUSION

AND

RECOMMENDATIONS
Present study has revealed that growth and its patterns in Kashmiri urban children in first two years of life are quite comparable to North Indian children. Our children have the potential to catch up the growth under favourable conditions. Feeding and weaning practices, maternal literacy and working status are important determinates of growth. The development has shown a great deal of variation with average age of attainment in various items of milestones. Majority of these ages are comparable to Indian values where as for some items our children are late attainers but this in no means indicates that they are abnormal children. The age range of achievement of all milestones lies within 3rd and 97th percentile values. Better initial birth weight (growth), gender difference (male child) maternal literacy and working mothers along with appropriate weaning practices of children was advantageous for attainment of developmental milestones.

To improve and sustain better growth and development of our children it is recommended that better antenatal and post-natal services with improved child caring and rearing practices coupled with maternal sensitization to child's physical and psychological needs, better home environment with learning opportunities and improvement in female literacy would go a long way in improving the growth and development of these children. This involves a multi-disciplinary approach of improvement of health care services, empowerment of women, encouraging female literacy and improvement of socio-economic status through integrated programme directed towards mother and children. Extension services from home science department can play an important role in planning, organizing, and implementing various activities/programmes directed in this direction.