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Objective: *To study the maternal child-rearing behaviors, parental attributes and socio-economic status of the family and to analyze their association with positive deviance in the developmental status of preschool children between 1-5 years of age. **Design:** Cross-sectional. **Setting:** Rural community. **Methods:** A total of 260 children and their mothers were evaluated. Weight and height-for-age indices were used to assess growth. ICMR Developmental Screening Test was used to assess psychosocial development. Bhatia's Performance Test was used to assess maternal intelligence. Narayan Rao's Rating Scale was used to assess socio-economic status and a child-rearing interview schedule developed and pretested for the purpose of the study to assess maternal child-rearing practices and behaviors. **Results:** Stepwise multiple regression with psychosocial development as dependent variable indicated significant associations between specific maternal behavioral categories and psychosocial development of 1-5 year old children. Children, whose mothers were responsive to their needs, were consistent in their interaction with them and were also emotionally stable during specific child rearing situations were those identified as "positive deviants" with regard to their development. Other factors, which were significantly associated with positive deviance in children, were paternal literacy and nuclear type of family. Significant differences were observed between genders. **Conclusions:** The data generated from the study could identify the important factors that were associated with "positive deviance" in the development of children. These factors can be useful components for parental counseling in clinical practice and as educational material in community programmes such as the ICDS and self-help groups at the village level.*

Key words: *Child-rearing, Growth, Positive deviance, Psychosocial development.*

THE synergistic role of the family's socio-economic environment, child rearing practices and nutrition and health status of the child are important aspects that can alter the direction of a child's growth and developmental trajectory. Results using multivariate analysis indicated the positive influence of maternal age, IQ, socio-economic status and paternal involvement in care on children's DQs and nutritional status(1,2). Bhogle(3) observed that development of children is regulated by many factors including social class and rearing practices prevalent within subcultures.

In the early 1970's, Wray(4) and Greaves(5) introduced the concept of "positive deviance" in growth and development. Greaves recommended that it would be worthwhile to identify "women who can cope; who do manage to rear healthy and active children", although "belonging to the same backward communities" in which most other women fail to cope. Mata(6) observed that "maternal technology" which pertains to practices, behaviors, traditions etc. might be a distinct determinant of the malnutrition complex. Since growth (nutrition) and development are inter-linked, rearing practices pertinent for one may also be relevant to the other in a holistic relationship. Positive deviance can be viewed as one of several inter-related adaptations to limited availability of resources(7). Therefore, caregivers who behave and interact positively and

consistently even when faced with multiple socio-economic deprivations, tend to rear children with better growth and development. They are, therefore, different from mothers who fail to cope positively with child rearing under similar conditions.

However, available literature on child-rearing practices is piece-meal and has not been systematically examined in relation to growth or development of young children. A study was, therefore, conducted to identify specific maternal child-rearing behaviors and other associated factors that could lead to positive deviance in developmental status of socio-economically-backward rural preschool children. The findings of the study are presented in this communication.

Subjects and Methods

A cross-sectional study was conducted in a randomly selected village in Medak district, an underdeveloped region in Telangana, Andhra Pradesh. The village consisted of 550 households with a majority of families engaged in agricultural labor for wages. All families with children between 1-5 years were contacted for inclusion in the study. Age of the children was assessed by examining the birth certificates when available, or by using a local events calendar for interviewing mothers. By this method it was possible to assess age to the nearest month and even fortnight for the younger children.

Assessment

Data on psychosocial development of children was collected using the ICMR Developmental Screening Test(8). Narayan Rao's Socio-economic Status Rating Scale(9) was used to collect information about the family socio-economic status (SES). The scale assesses details about the caste, education, occupation and income of family members. Data on height/length and weight of children were collected using standard equipment and methods. For children below the age of two years, length was measured using an infantometer. For older children, height was measured by the standard anthropometric rod. The instruments were checked everyday before use as a measure of quality control. Nutritional status was assessed by comparing individual heights and weights of children against the NCHS reference standards(10). Maternal intelligence was assessed using Bhatia's Performance Test(11) and, child rearing practices in terms of behaviors of mother were assessed using a specially developed and pre-tested 48 item interview schedule covering feeding, weaning, toilet training, play, sleep and discipline areas. The research team consisting of a senior psychologist, a post-graduate in child development and two field technicians trained in anthropometry tested mothers and children.

Analysis

Data on psychosocial development was analyzed by computing Motor Quotient, Mental Quotient and Developmental Quotient (DQ) for each child by converting raw scores into Z scores.

The SES data on caste, education, occupation, type of family and income of the parents was scored and analyzed individually to retrieve more meaningful data on each aspect.

Intelligence quotient was calculated for each mother as per the instructions in the manual(11). The scores of individual mothers were used for analysis. Data were tabulated separately for boys and girls of 1-5 years age group.

Each question in the maternal child-rearing behavior schedule had been structured providing two or three alternative answers following pre-testing. These alternatives were scored 1,2 or 3 depending on the number of alternatives to each question. Maternal child rearing behaviors were

scored and analyzed individually and classified under three behavioral categories, viz., responsiveness, consistency and emotional stability. These care behaviours have been found by other researchers to be related to positive deviance with regard to the nutritional status of preschoolers(7).

The variables found significantly associated using the univariate analysis were included in the multiple regression analysis to observe interrelationships. The number and type of variables associated with the development of boys and girls 1-5 years of age were significantly different. The results are therefore presented according to gender.

Step-wise multiple regression analytical technique was applied using the children's motor, mental and total developmental scores as dependent variables. Child's height and weight for age, child-rearing behaviors of mothers, SES (caste, parental education, income, occupation and type of family) and maternal IQ scores were included as independent variables. A total of 39 variables were included in the correlation matrix. The R2 value and F ratio depicting the significance of the model were computed.

Results

A total of 260 preschool children 1-5 years of age and their parents were covered out of 269 families listed during an earlier enumeration. Nine children could not be traced because their families had either migrated or they had been out of station on four occasions when contacted for assessment. A majority of families in the study village were poor agricultural laborers (72%). A few families possessed more than 5 acres of land (5%). The remaining families included skilled workers, such as basket weavers, blacksmiths, etc.

Table I lists the variables identified to be significantly associated with positive deviance on univariate analysis. Table II depicts the significant child rearing practices that influenced the motor, mental and overall developmental quotients of 1-5 years old boys and girls.

Table I - List of Variables Significantly Associated with Positive Deviance (Univariate Analysis)

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Responsivity
M breastfed C on demand
M gives food whenever C demands it
M complies to C's request for food even if in hurry to go to work or is tired
M soothes/strokes C while breast feeding
M soothes C to sleep if he awakens at night
M checks play-things for sharp edges before giving them to child for play
Consistency
M gradually stops breastfeeding by giving solid foods
M teaches to eat neatly if C messes with food
M teaches C about personal hygiene/cleanliness during toilet training
M encourage C to indicate toilet needs
M teaches C to go a reasonable distance from home for toilet needs
M insists/scolds C to wash hands before eating
M scolds C for putting dirty hands in drinking water pot but also tells why
M insists that C plays only in front of the house and not far

Emotional Stability

M never uses physical punishment when C is naughty
 M gets angry but also explains why, if C smashes a valuable article
 M not anxious about peer group influence on C
 M does not feel her C is deprived compared to other children

Nutritional and Social Variables

Weight for age, Height for age, Family type, Family caste, Maternal literacy, Paternal literacy, Maternal occupation, Paternal occupation, Maternal IQ, Maternal age, Birth-order of child, Organization of home, Mass media exposures, Exposure to town.

*M = Mother, C = Child.

Table II - Child Rearing and Other Factors Significantly Associated with the Development of 1-5 Years Old Children

	Maternal child rearing behaviors			Other factors
	Responsiveness	Consistency	Emotional stability	
Motor Q				
<i>Boys</i> (R2 = 20.5 %)	<ul style="list-style-type: none"> • M breastfed on demand • M gives food whenever C asks 	<ul style="list-style-type: none"> • M scolds C for putting dirty hands in drinking water pot but also tells why 	<ul style="list-style-type: none"> • M gets angry but also explains why, if C smashes a valuable article 	<ul style="list-style-type: none"> • Nuclear family
<i>Girls</i> (R2 = 27.14 %)	<ul style="list-style-type: none"> • M breastfed on demand • M gives food whenever C asks 	<ul style="list-style-type: none"> • M teaches C about personal cleanliness during toilet training 	—	—
Mental Q				
<i>Boys</i> (R2 = 23.16 %)	<ul style="list-style-type: none"> • M breastfed on demand • M soothes C while breastfeeding 	<ul style="list-style-type: none"> • M insists that C plays only near the home 	<ul style="list-style-type: none"> • Mother never uses physical punishment when C is naughty 	
<i>Girls</i> (R2 = 35.14 %)	<ul style="list-style-type: none"> • M breastfed on demand 	<ul style="list-style-type: none"> • M gradually stops breastfeeding by giving solid foods 	—	<ul style="list-style-type: none"> • Father literate
Dev Q				
<i>Boys</i> (R2 = 24.36 %)	<ul style="list-style-type: none"> • M breastfed on demand • M gives food whenever C asks 	<ul style="list-style-type: none"> • M scolds C for putting dirty hands in drinking water pot but also tells why 	<ul style="list-style-type: none"> • M gets angry but also explains why, If C smashes a valuable article. 	<ul style="list-style-type: none"> • Nuclear Family

Girls (R2 = 32.86 %)	• M breastfed on demand	• M gradually stops breastfeeding by giving solid foods	—	• Father literate
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M = Mother; C = Child.

Responsiveness to Child's Cues

Maternal responsiveness in terms of breast feeding on demand was the most significant variable ($p < 0.05$) associated with positive deviance in motor, mental and overall development of both boys and girls. Responsiveness to 'children's request for food' by providing it 'without making the child wait' was also significant ($p < 0.05$) for positive deviance in motor development of boys and girls, and for overall development of boys. In addition, maternal responsiveness in terms of soothing while breastfeeding was observed to be significant ($p < 0.05$) for the mental development of boys.

Consistency

Variables, which assessed the consistency of child rearing responses in relation to positive deviance in developmental status, were different for boys and girls. Maternal consistency in disciplining by 'scolding for putting dirty hands in the drinking water pot' and 'allowed only to play near the home' were significant ($p < 0.05$) for the motor and mental development of boys. For girls, significant variables for positive deviance in motor and mental development included, 'teaching personal cleanliness' and 'gradual weaning from breast milk by introducing other foods' ($p < 0.05$).

Emotional Stability

The variables assessing maternal emotional stability which were significantly ($p < 0.05$) associated with positive deviance in motor and mental development of boys included, 'mother gets angry but also explains why when child smashes a valuable article' and 'mother never uses physical punishment even when child is naughty'. Maternal emotional stability did not have any positive contribution to the development in girls.

Other Variables

Amongst boys, belonging to a nuclear type of family was significantly ($p < 0.05$) associated with positive deviance in the motor and overall development. Father's literacy was significantly ($p < 0.05$) associated with positive deviance in the mental and overall developmental status of girls.

It must however be noted that maternal and other social factors at best only explained about a third of the variation. It is obvious that other factors, not studied, had an equally important contribution to positive deviance during child development.

Discussion

Poor quality child care puts children's development at risk for poorer cognitive scores and lesser ratings of social and emotional adjustment. However, child care is not a uniform intervention and should not be discussed as such, a point that has been emphasized by many researchers(12,13). Just as all home environments are not the same, child care environments are not all the same and some are better for children than others.

The child-rearing behaviors of mothers significant for the positive deviance in developmental status of 1-5 years old boys and girls were studied under three categories namely, 'responsiveness to child's cues', 'consistency in disciplining' and 'emotional stability'. These behavioral categories were found to be significant in several studies on positive deviance in nutritional status of infants and preschoolers(7,14-17). Greenspan described the psychological developmental agenda of the infant between birth and two-and-a-half years which, according to him, was also linked to the nutritional agenda over the same period(18). Although malnutrition and retardation of the psychological milestones have been associated, it is assumed that human development follows a species-typical path and most of the stages of development are not culture-specific. Their expression however may be defined by the culture. There are specific tasks and capacities of infants and young children, which develop during infancy and preschool age. These include: (i) mother and infant attachment achieved through breast feeding and frequent affectionate nursing, (ii) reciprocal communication leading to supplementary feeding, (iii) behavioral organization and initiative as child starts to feed self by eating adult food, and (iv) representational capacity when the child is able to understand cultural rules and behaves appropriately(18).

The results of the present study confirm the significant association between nutrition and development. Responsiveness to child's cues of hunger by breastfeeding or providing food on demand rather than on a schedule was significantly associated with children's development irrespective of gender. Further, it appears that boys require more affectionate interactions and expressions of attachment than girls for attaining developmental milestones, thus suggesting the greater vulnerability of boys to emotional deprivation and psychosocial maladjustment. Neither the study data nor the literature permits further assumptions or probabilities to account for these gender differences. In-depth studies are required to further interpret gender differences.

The gradual process of weaning from the breast for girls indicates maternal reciprocity and consistency in responding. It also shows positive interpretation and action taken by mothers on the non-verbal signals of the child's need for extra food. This behavior was significantly associated with positive deviance in mental and overall development of girls but not of boys. It however, does not mean that boys were not weaned gradually. It is possible that they are routinely weaned gradually and hence this behavior is not discriminative. But among girls, this may not be a routine and hence of greater significance. This behavior could therefore discriminate between girls who were given solid foods gradually from those who were not with regard to positive deviance in their development. Another explanation could be the existent cultural practice of breastfeeding boys for a longer period compared to girls. Hence, the reference period for weaning may be different for boys and girls.

Consistency in disciplining the child is also known to be associated with positive deviance. The behaviors in this context were different for boys and girls. Explaining adult actions to children, which they can understand, seems to promote their development. Mother's insistence that children play near the house was significantly associated with positive deviance in the mental development of boys. It is known that between the ages of 9-24 months, the toddler becomes more active and goal-directed in play and exploration(18). Allowing the child to play and explore, albeit near the home, indicates maternal concern for the child's safety during this period as well as provision of play opportunities. Mothers tend to use teaching and training more commonly for rearing girls for future 'gender appropriate' roles, unlike boys who are more often subjected to disciplining strategies.

Emotional stability which means exercising restraint during critical situations, which provoke anger, is also known to be associated with positive deviance. The behaviors in this category were significantly associated with the development of boys. Mothers who never used physical punishment whatever the provocation and/or also explained the reasons for their anger tended to rear boys who were positively deviant in mental development. Some earlier studies have observed that verbal instructions and physical demonstrations of what is wrong before the fact, instead of

harshly punishing wrong behavior after it occurs, was linked to better growth of children(16,19). From the results of the present study, it seems to be true for development as well.

Social variables such as type of family and paternal literacy were also significantly associated with positive deviance in the development of children. Being reared in a nuclear family was significant for boys but not for girls. Father being literate was significant for girls. It is possible that under constraints of limited resources, boys in nuclear families could manage to get food, attention and other benefits required for positive development. For girls, fathers who were literate made a difference (possibly because they did not discriminate between boys and girls) and probably facilitated the provision of food and other benefits (paternal literacy may mean better economic status) due to better awareness.

The results of this study indicate that provision of food (including breast milk) to children on demand, disciplining and training children without resort to physical abuse but meaningful dialogue and bringing up children in an environment free of gender discrimination is associated with positive deviance in child development. The information generated from such studies can be of value in parental counselling and in the development of meaningful educational strategies for mothers of the under three-year-olds in the ICDS and other self help groups involved in empowering parents.

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Competing interests: None stated.

Key Messages

- Positive deviance refers to children who were found to possess normal growth and development even though they were reared in deprived families.
- In children between 1-5 years, positive deviance in development is associated with availability of adequate nutrition, discipline and training through meaningful parent-child dialogue and an environment free of gender discrimination.

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