



Mothers' caregiving resources and practices for children under 5 years in the slums of Hyderabad, India: a cross-sectional study

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ABSTRACT

Background: The extended care model of the United Nations Children's Fund (UNICEF) identifies knowledge/beliefs, nutritional status, mental health, control of resources/autonomy, workload/time constraints and social support as important caregiver resources for childcare. The aim of this paper is to examine the role of mothers' caregiving resources in child-care practices in slums.

Methods: A cross-sectional study was conducted in 10 slums of Hyderabad, to appraise the caregiving practices and health status of children under 5 years. Data were collected from 506 households, selected through multistage stratified random sampling, and data relating to 451 children aged 6–59 months were analysed. Four caregiving practices were studied: psychosocial stimulation, as assessed by the Home Observation Measurement of the Environment inventory; hygienic care rated by spot-check observation; and meal frequency and dietary diversity based on maternal recall. The role of the mother's caregiving resources was examined using bivariate and multivariate logistic regression analyses.

Results: More than 50% of the children received good psychosocial stimulation and close to 60% had good hygienic care. About 75% of the children aged 6–23 months had the recommended minimum meal frequency and 13% had the recommended dietary diversity. Mother's media exposure (odds ratio [OR] 2.25, 95% confidence interval [CI] 1.35–3.77), participation in household budgeting (OR 2.19, CI 1.25–3.83) and husband's support (OR 2.04, CI 1.28–3.24) were predictors of psychosocial stimulation. Mother's younger age (OR 1.11, CI 1.04–1.18), poor media exposure (OR 1.95, CI 1.15–3.29), dissatisfaction with life (OR 1.84, CI 1.05–3.24), workload (OR 1.79, CI 1–3.18) and having no money for their own use (OR 1.52, CI 0.95–2.45) placed children at higher odds for receiving poor hygienic care. Leisure time (OR 2.75, CI 1.25–6.06) and participation in budgeting (OR 1.97, CI 1–3.86) were predictors of meal frequency.

Conclusion: Mother's workload, poor media exposure, dissatisfaction with life, lack of husband's support and absence of economic autonomy are constraints to good child care in slums.

Key words: caregiving practices, caregiving resources, dietary diversity, hygienic care, meal frequency, psychosocial stimulation, slum

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INTRODUCTION

Caregiving practices or behaviours are proximal aspects of a child's environment which influence their growth and development. The United Nations Children's Fund (UNICEF) extended child-care framework (Fig. 1)¹ highlights caregiver

characteristics as important caregiving resources. Studies on national data from India and Ethiopia, and research from Accra,^{2,3,4} indicate that caregiver characteristics/resources affect caregiving practices for children. The World Health Organization (WHO) underscores the need for research on the nature and determinants of child care.¹ India has witnessed a

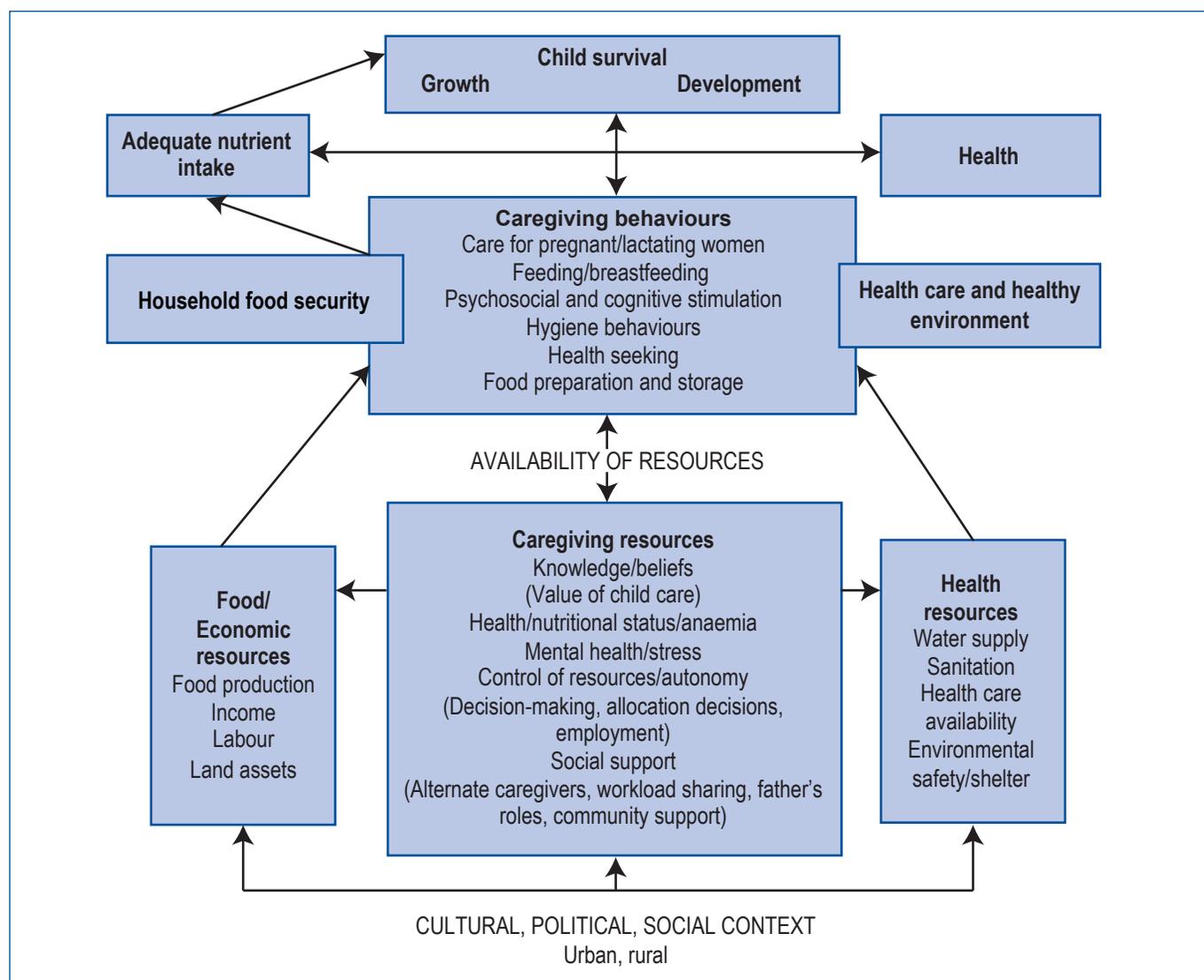


Figure 1: The extended model of care (UNICEF)

Source: WHO, 2004¹

remarkable growth of its urban population and consequently of slums. As per the 2011 Census, one-sixth of all urban households (17.4%) in India are slum households.⁵ A recent study has shown that growth in populations living in urban slum conditions increases infant and child mortality rates in developing countries.⁶ Studies have shown that the health and nutritional status of children of the urban poor in India are similar or worse than children in rural areas, and that they also receive inadequate care.^{7,8,9} Hyderabad is a fast-growing metropolitan city in India, with 31.8% of all households in the municipal corporation area residing in slums.⁵

The purpose of this paper is to identify the role of mothers' caregiving resources on caring practices for children under 5 years in the slum settlements of Hyderabad, India. It is expected that even when poverty and a hazardous environment predispose to undernutrition and ill-health, good caregiving practices will optimize the use of existing resources. It is hypothesized that the mother's caregiving resources will be significant predictors of child-care practices in slums.

METHODS

A cross-sectional survey was conducted in 10 slums of Hyderabad, India, from December 2012 to April 2013, to appraise the caregiving practices, nutritional status and development of children under 5 years of age. Most recent surveys by the Greater Hyderabad Municipal Corporation have estimated the slum population in Hyderabad to be 2 million in listed slums.¹⁰ The population of unlisted slums is estimated at roughly 0.6 million. Data were collected from 506 households with at least one child under 5 years whose mother was alive and staying with the child. If there was more than one child, the last born was selected for data collection. Data from children aged 6–59 months were used. Informed verbal consent was taken from all respondents. Approval from the research and development department of the Tata Institute of Social Sciences was obtained prior to initiation of the study.

The sample size for the child-health survey was estimated as 506, based on the 32.4% prevalence of stunting in Hyderabad

slum populations reported in the National Family Health Survey-3 (NFHS-3), with confidence level at 95%, 5% margin of error and a design effect of 1.5. There were 451 children aged 6 months and above in this sample, whose data were studied for this paper.

Multistage stratified random sampling was done, ensuring proportional representation of the population from the central as well as peripheral areas of the city and slums, from the government list of slums and unlisted slums. First, three municipal wards from the central region and two wards from the peripheral regions were randomly selected. Ten slums were randomly picked from selected wards: six slums (four listed [two per ward], two unlisted [one per ward]) from the central region; and four slums (three listed [two per ward and one random], one unlisted [random from three wards]) from the peripheral regions of the city. If unlisted slums were not present in the selected wards, the ones located nearby were included. About the same number of households (51 listed/50 unlisted) from each slum were included to reach the sample size of 506.

In order to select mother-child dyads from the slums, a lane was randomly selected to begin the survey and households with under-fives were enrolled in the study. Once the first lane had been surveyed, eligible households from the adjacent lane were approached and so on until the required number for each slum was reached. Children who were acutely ill or had congenital defects, and those whose mothers had migrated to the city in the past 6 months or were not willing to participate in the study were excluded.

The details of household, child and mother characteristics were obtained from personal interviews with the mother. A semistructured interview schedule was developed based on the caregiver and household determinants of child health reported in the literature. The tool was pretested in 25 households. All interviews were conducted in local languages.

The caregiving practices studied were psychosocial stimulation, hygienic care, meal frequency and dietary diversity. Psychosocial stimulation refers to the extent that the environment provides physical stimulation through sensory input, as well as emotional stimulation provided through an affectionate bond between the caregiver and the child.¹¹ It was measured by the Home Observation Measurement of the Environment-Short Form (HOME-SF), a standardized inventory for measuring the quality of a child's home environment.¹²

HOME-SF is a modification of the HOME inventory^{12,13} and comprises observation and mother reports measuring emotional support and cognitive stimulation provided to children. It has four parts, one part each for: children under 3 years, those between the ages of 3 and 5 years, ages 6-9 years, and 10 years and older. In the present study, the first two parts were used with slight modifications for the slum population, after translation into the local languages. Hygienic care was assessed by a spot-check observation of 13 hygiene aspects, namely: cleanliness of the mother; the child's hands and body; the child's bottom; the child's play area; the house;

the compound; the cooking and serving vessels; observation of whether the child had any underwear; whether drinking-water was kept covered; whether there was any stagnant water in and around the house; whether there was any soap near the hand-washing area; whether there was any detergent near the utensil-washing area; and asking how stool last passed by the child was disposed of. Each positive observation was scored one and a total score was calculated. For assessing feeding practices, the mother was asked to list all foods and liquids consumed by the child in the previous 24 hours.

The mother's caregiving resources (Table 1) were selected based on UNICEF's extended care model (Fig. 1). Maternal literacy and media exposure were included as proxies of the mother's knowledge and beliefs, and body mass index (BMI) indicated nutritional status. Questions were asked about the mother's happiness and general satisfaction with married life, the financial situation of the family, her own health, and the child's health and care. A composite score derived by principal component analysis was used as a proxy for measuring the mother's lack of stress and mental health. Control of resources or financial autonomy of the mother was assessed by asking whether she was currently employed, had money that she alone could decide how to use, and whether she participated in family budgeting. The mother's workload was assessed by the amount of leisure time available per day and social support obtained from the husband in helping to care for the child and in home tasks. The mother's age was also included in the resources list, as older age has been proven to be advantageous for child care. Based on previous research, several covariates were considered as potential confounders of the relationship between the mother's resources and caregiving practices; these are listed and explained in Table 1.

Psychosocial stimulation was evaluated by computing the summated scores of each child derived from the HOME-SF inventory. As the maximum score varies by age (6-35 months, 36-60 months), HOME score quartiles of each group were calculated separately and children were grouped as having high, moderately high, medium or poor HOME scores. Total scores obtained for each child for hygienic care fell into three groups and children were categorized as having good, average or poor hygiene. Minimum meal frequency and dietary diversity are two important indicators proposed by WHO to assess infant and young child feeding of children aged 6-23 months.¹⁴ Hence, for this study, the feeding behaviours of only 248 out of 451 children aged 6-23 months were considered. For breastfed children, the following were considered the minimum requirements: a meal frequency of two times if the child was 6-8 months, and three times if 9-23 months. For non-breastfed children, a frequency of four times for all ages was considered the minimum needed. For calculating dietary diversity, a score based on seven food groups was created. The food groups used for calculation were grains, roots, tubers; legumes and nuts; dairy products; flesh foods; eggs; vitamin A-rich fruits and vegetables; and other fruits and vegetables. For each food group, one point was added to make a final score out of seven; scores more than or equal to four are considered adequate by WHO standards.

Table 1: Characteristics of children, households and mothers

Characteristics of children and households			Caregiving resources of mothers		
	Number	Percentage		Number	Percentage
Age of child (months)			Mother's age (years; mean=24.83 [SD 3.921])		
6–11	89	19.7	<20	14	3.1
12–23	159	35.3	20–25	200	44.3
24–35	87	19.3	>25	237	52.5
36–47	72	16			
48–59	44	9.8	Literacy		
Sex of child			Literate	263	58.3
Male	271	60.1	Illiterate	188	41.7
Female	180	39.9	Media exposure ^a		
Child's birth order			Good	156	34.6
1 or 2	340	75.4	Average	167	37
3+	111	24.6	Poor	128	28.4
Preceding birth interval (months)			Body mass index (kg/m ²)		
≥24	245	54.3	<18.5	110	24.4
First born	136	30.2	≥18.5	341	75.6
<24	70	15.5	Satisfaction with life		
Father's literacy			Yes	362	80.3
Literate	311	69	No	89	19.7
Illiterate	140	31	Current employment		
Father's occupation			Yes	76	16.9
Service/skilled labourer	289	63.4	No	375	83.1
Unskilled labourer	165	36.6	Has money that she alone can use		
Food security ^b			No	139	30.8
Good	223	49.4	Yes	312	69.2
Medium	166	36.8	Participates in family budgeting		
Poor	62	13.7	No	143	31.7
Wealth index ^c			Yes	308	68.3
First/second quintile	184	40.8	Leisure time/day		
Third/fourth/fifth quintile	267	59.2	2 h or more	367	
Family type			<2 h	84	18.6
Nuclear	304	67.4	Support from husband		
Joint	147	32.6	Yes	223	49.4
No. of people sleeping per room (crowding)			No	228	50.6
2–3	157	34.8			
4+	294	65.2			
Toilet facilities					
Improved	331	73.4			
Open field	120	26.6			
Source of drinking-water					
Piped to yard	134	29.7			
Public tap/tanker truck	317	70.3			
Type of slum					
Listed	323	71.3			
Unlisted	128	28.4			

SD: standard deviation

^a Mothers were asked how often they were able to read a newspaper or magazine, listen to the radio, watch television and watch films at the cinema, and they were expected to respond as almost every day, at least once a week, less than once a week or not at all; for watching films at the cinema, they were expected to respond as almost every week, at least once a month, less than once a month or not at all. Using principal component analysis (PCA), mass media exposure scores were derived, which were further divided into tertiles to categorize the scores as good, average or poor exposure.

^b Food security was assessed by asking five questions selected from the Household Food Insecurity (Access) scale on the food situation of the past 1 month and tertiles of scores were calculated.

^c Wealth index was calculated as described in National Family Health Survey-3 (NFHS-3), by using PCA to take into account data on source of drinking-water, source of non-drinking water, toilet facilities, electricity, and household possession of car, moped/scooter/motorcycle, telephone, refrigerator, colour television, electric cooler, bicycle, electric fan, radio/transistor, sewing machine, black and white television, computer, water pump, mattress, pressure cooker, chair, sofa set, cot/bed, table and clock/watch; the type of cooking fuel; main material of construction for the floor, roof and wall; type of windows; number of family members per sleeping room; number of family members with a bank or post-office account; and house ownership.

Logistic regression analysis was done to determine the predictors of child-care practices. The role of mother's caregiving resources was tested using bivariate and multivariate logistic regression. For regression analyses, scores in the two lower quartiles were considered as unsatisfactory outcomes (<62% of the total score) for psychosocial stimulation, and for hygienic care the two lower tertiles ($\leq 69\%$ of the total hygiene score) were considered unsatisfactory. As dietary diversity including four groups or more was infrequent in slum children, analysis was done for factors facilitating consumption of at least three food groups. In the bivariate analysis, the association of caregiving practices with each dependent variable was assessed. All variables of interest with a probability value less than 0.30 on bivariate analysis were included in the multivariate analysis. Two models were examined: one with caregiving resources alone, and another controlling for potentially confounding child and household characteristics. The analyses were done using SPSS version 15.0.

RESULTS

Out of 451 children, 248 (55%) were aged 6–23 months, 271 (60%) were male children, 111 (25%) were third or more in birth order, and 70 (16%) had less than 24 months of preceding birth interval. Sixty-nine per cent (311) had fathers who were literate, and 37% (165) had fathers who were unskilled labourers. Most of the children (304 [68%]) belonged to nuclear families. Out of the 451 households, 267 (59%) belonged to the three lower quintiles of the wealth index, 228 households (51%) had doubtful food security and 120 (27%) did not have any toilet. Seventy per cent (317) of households depended on a public tap or tanker trucks for drinking water, and 294 (65%) households were crowded and had to accommodate four or more persons in a sleeping room. About 28% of families were residing in unlisted slums (Table 1).

Regarding the mother's caregiving resources, the mean age of the mothers was 24.8 ± 3.9 years. About 42% (188) were illiterate, only 156 (35%) had good exposure to the media, and 110 (24%) had a BMI of less than 18.5 kg/m^2 . Despite living in slums, 80% (362) of mothers were generally satisfied and happy with their lives. Out of 451 mothers, only 76 (17%) were employed, 312 (69%) had money of their own that they alone could decide how to use, and 308 (68%) participated in family budgeting. Eighty-four (19%) mothers did not get even 2 hours leisure time per day, and 228 (51%) did not receive any support from their husbands in child care or home tasks (Table 1).

Caregiving practices

Table 2 shows the psychosocial stimulation and hygienic practices of children under 5 years in the slums of Hyderabad, India. Classification of children aged 6–35 months and 36–59 months based on their HOME scores are listed, along with range and mean scores. Among 451 children aged 6–59 months, 122 children (27%) received high cognitive and psychosocial stimulation (78–100% of total scores) at their homes. While another 26% (117) received moderately high levels (65–78% of total scores) of stimulation, the remaining 45% (212) received only poor-to-medium levels (28–61% of total scores)

of stimulation in their homes. The hygiene scores of 185 (41%) households were not satisfactory (range 1–9; 8–69% of total scores). Among 248 children aged 6–23 months, 74% (183) received at least the minimum number of feeds/meals required; however, the quality of feeds or dietary diversity of 87% (215) of children was suboptimal (fewer than four food groups) and 55% (137) of children had a diet of items from fewer than three food groups.

Bivariate analysis

Table 3 presents the results of bivariate analyses examining the association between the mothers' caregiving resources and caregiving practices for children. All mothers' characteristics except BMI and employment status were associated with psychosocial stimulation. BMI, participation in budgeting and support from husbands were the only factors not associated with hygienic care. Mothers' literacy, media exposure and satisfaction with life had very strong ($P < 0.01$) associations, and having money for own use had moderately strong ($P < 0.05$) associations with psychosocial stimulation and hygienic care. As to feeding practices for children under 24 months, not many maternal factors demonstrated association. While mothers' participation in budgeting ($P < 0.1$) and amount of leisure time per day ($P < 0.05$) were associated with meal frequency, media exposure and BMI were weakly associated with dietary diversity ($P < 0.1$).

Table 4 presents the results of bivariate analyses, testing the association of child and household characteristics with caregiving practices. Child's birth order, preceding birth interval, father's literacy, occupation, food security, wealth index, toilet facilities, source of drinking water, type of slum and crowding were strongly associated with psychosocial stimulation ($P < 0.01$). In the same way, all the above characteristics except birth order and crowding ($P < 0.05$), along with family type, were strongly associated ($P < 0.01$) with hygienic care. Child's age ($P < 0.01$); family type, food security and toilet facilities ($P < 0.05$) were found to influence a child's meal frequency. Child's age ($P < 0.01$), wealth index, crowding and source of drinking water ($P < 0.05$) were the factors associated with dietary diversity for children aged 6–23 months.

Multivariate analysis

In model 1 of the multivariate logistic regressions, where all maternal resource variables were included, adjusting for their combined effects on child care, maternal literacy (OR 2.04), media exposure (OR 3.09), participation in family budgeting (OR 1.75) and support from the husband (OR 1.46) retained associations with psychosocial stimulation. Model 2 shows ORs derived after adjusting for the confounding child and household variables, and all except maternal literacy proved to be predictors of psychosocial care: media exposure (OR 2.42; 95% confidence interval [CI] 1.51–3.88), participation in family budgeting (OR 2.19; 95% CI 1.25–3.83) and support from the husband (OR 2.04; 95% CI 1.28–3.24) (Table 5). The association with mothers' leisure time was not significant ($P < 0.1$) when child and household factors were controlled.

Table 2: Caregiving practices for children aged 6–59 months in the slums of Hyderabad, India

Caregiving practice	Number (%)	Range	Mean (SD)
Psychosocial stimulation			
Children aged 6–35 months (<i>N</i> = 335) (maximum score 18)			
High HOME score (first quartile)	91 (27.2)	14–18	15.37 (1.29)
Moderately high HOME score (second quartile)	93 (27.8)	12–13	12.52 (0.5)
Medium HOME score (third tertile)	83 (24.8)	10–11	10.53 (0.5)
Poor HOME score (fourth quartile)	68 (20.3)	5–9	7.96 (1.37)
Total	335	5–18	11.87 (2.82)
Children aged 36–59 months (<i>N</i> = 116) (maximum score 23)			
High HOME score (first quartile)	31 (26.7)	18–23	19.61 (1.43)
Moderately high HOME score (second quartile)	24 (20.7)	15–17	15.96 (0.91)
Medium HOME score (third tertile)	37 (31.9)	11–14	12.57 (1.21)
Poor HOME score (fourth quartile)	24 (20.7)	6–10	8.08 (1.35)
Total	116	6–23	14.22 (4.33)
Children aged 6–59 months (<i>N</i> = 451)			
High HOME score (first quartile)	122 (27.1)		
Moderately high HOME score (second quartile)	117 (25.9)		
Medium HOME score (third tertile)	120 (26.6)		
Poor HOME score (fourth quartile)	92 (20.4)		
Total	451 (100)		
Hygienic care			
Children aged 6–59 months (<i>N</i> = 451) (maximum score: 13)			
Good	266 (59)	10–13	11.57 (1.1)
Average	141 (31.3)	6–9	7.63 (1.1)
Poor	44 (9.8)	1–5	3.7 (1.09)
Total	451	1–13	9.57 (2.85)

HOME: Home Observation Measurement of the Environment; SD: standard deviation

With respect to hygienic care, mothers' age (OR 1.1), literacy (OR 2.31), media exposure (OR 1.95), satisfaction with life (OR 2.14) and leisure time per day (OR 2) maintained associations in model 1. When all covariates were included in the analysis (model 2), maternal literacy showed no significance. Maternal age (OR 1.11; 95% CI 1.04–1.18), media exposure (OR 1.95; 95% CI 1.15–3.29), satisfaction (OR 1.84; 95% CI 1.05–3.24) and leisure time (OR 1.79; 95% CI 1–3.18) were significant predictors of hygiene. Interestingly, the mother having her own money demonstrated a non-significant association ($P < 0.1$) when child and household factors were controlled. Table 6 shows the multivariate analysis results relating to the feeding practices of children under 2 years. In model 1, leisure time/day (OR 2.47; 95% CI 1.2–5.07) demonstrated a significant association with meal frequency. Association of participation in budgeting was not significant ($P < 0.1$). None of the maternal factors was significantly associated with children's dietary diversity except for media exposure and BMI, which showed a non-significant association ($P < 0.1$). In model 2, available leisure time (OR 2.75; 95% CI 1.25–6.06) and participation in

budgeting (OR 1.97; 95% CI 1–3.86) demonstrated significant associations with children's meal frequency. Except for BMI demonstrating a weak association (OR 1.7; 95% CI 0.92–3.13), none of the maternal factors was associated with dietary diversity. The child's preceding birth interval and household wealth index were associated with psychosocial stimulation; birth order, wealth index and source of drinking water were associated with hygienic care; family type and the child's age were associated with meal frequency; and the child's age was significantly associated with dietary diversity.

DISCUSSION

This study was intended to identify the maternal resources or characteristics that influence caregiving practices and to evaluate their relative importance while controlling for household and child factors.

Psychosocial and cognitive stimulation is an important child-rearing practice directly related to child development and this

Table 3: Association of mothers' caregiving resources with caregiving practices for children: bivariate analyses using logistic regression

Caregiving resource of the mother	Psychosocial stimulation		Hygienic care		Meal frequency		Dietary diversity	
	Good, % (N = 239)	OR (95% CI)	Good, % (N = 266)	OR (95% CI)	Minimum, % (N = 183)	OR (95% CI)	≥3 food groups, % (N = 111)	OR (95% CI)
Mother's age (continuous variable)		1.028 (0.98–1.08)		1.08*** (1.03–1.14)		1.05 (0.97–1.14)		1.02 (0.96–1.1)
Literacy								
Literate	63.5	2.8*** (1.9–4.13)	70.3	3.13*** (2.12–4.64)	76.4	1.38 (0.78–2.45)	46.6	1.21 (0.72–2.01)
Illiterate ^a	38.3		43.1		70		42	
Media exposure								
Good	73.7	3.87*** (2.53–5.92)	75.6	3.08*** (2–4.75)	75.6	1.15 (0.63–2.11)	52.3	1.6* (0.94–2.7)
Average/poor ^a	42		50.2		72.8		40.7	
BMI (kg/m ²)								
<18.5 ^a	49.1	1.23 (0.8–1.89)	53.6	1.34 (0.87–2.06)	71.4	1.18 (0.63–2.2)	35.7	1.68* (0.95–2.98)
≥18.5	54.3		60.7		74.7		48.3	
Satisfaction with life								
Yes	56.6	2.11*** (1.31–3.4)	63.8	2.72*** (1.69–4.38)	74.1	1.11 (0.53–2.32)	46.3	1.46 (0.74–2.87)
No ^a	38.2		39.3		72.1		37.2	
Employed								
Yes	44.7	0.67 (0.41–1.1)	47.4	0.57** (0.35–0.93)	69	0.76 (0.33–1.77)	55.2	1.61 (0.74–3.5)
No ^a	54.7		61.3		74.4		43.4	
Has own money to use								
No ^a	45.3	1.561** (1.04–2.33)	51.8	1.54** (1.02–2.34)	73.7	1.01 (0.55–1.86)	42.1	1.17 (0.68–2.02)
Yes	56.4		62.2		73.8		45.9	
Participates in budgeting								
No ^a	42.7	1.84*** (1.23–2.75)	58.7	1.02 (0.68–1.52)	66.7	1.74* (0.97–3.1)	39.1	1.43 (0.84–2.43)
Yes	57.8		59.1		77.6		47.8	
Leisure time/day								
2+ h	40.5	1.86** (1.15–3.01)	46.4	1.87*** (1.16–3.02)	59.5	2.24** (1.12–4.49)	43.7	0.78 (0.4–1.51)
<2 h ^a	55.9		61.9		76.7		50	
Support from husband								
Yes	59.2	1.64*** (1.13–2.38)	61	1.18 (0.81–1.72)	76.4	1.32 (0.75–2.32)	42.5	0.83 (0.5–1.37)
No ^a	46.9		57		71.1		47.1	

CI: confidence interval; OR: odds ratio; *: $P < 0.1$; **: $P < 0.05$; ***: $P < 0.01$.

^a Reference group.

has been corroborated by studies on HOME scores and child development.^{15,16} HOME scores assess the quality and quantity of support for and stimulation provided to children at home. It has been proved that psychosocial stimulation also promotes children's growth and nutrition.¹⁷ Hygiene practices also play an important role in the health and nutrition of children by reducing infections and promoting appetite, and thereby food intake. A slum study in Kenya demonstrated that good hygiene behaviour reduced the risk of diarrhoea.¹⁸

The present study establishes the mother's exposure to media and economic autonomy as beneficial for psychosocial stimulation and hygienic care. The media exposes mothers to modern child-care practices and reinforces the importance of hygiene, play, toys and parental involvement in care. For women who live in slums and who barely move out of their homes (the few employed women went to nearby workplaces), television is the most accessed (73%) medium and opens windows to the outer world. It familiarizes the women with the practices and lives of

Table 4: Association of child and household characteristics with caregiving practices for children: bivariate analyses using logistic regression

Characteristics of the child and household	Psychosocial stimulation		Hygienic care		Meal frequency		Dietary diversity	
	Satisfactory, % (N = 239)	OR (95% CI)	Good, % (N = 266)	OR (95% CI)	Minimum, % (N = 183)	OR (95% CI)	≥3 groups, % (N = 111)	OR (95% CI)
Age of the child (continuous variable)	1.004 (0.99–1.02)		1.01 (0.99–1.02)		1.13*** (1.06–1.21)		1.2*** (1.06–1.19)	
Birth order								
Birth order 1 or 2	57.6	2.15*** (1.39–3.34)	63.2	2.02*** (1.31–3.12)	73.2	0.86 (0.42–1.78)	46.5	1.42 (0.75–2.67)
Birth order 3+ ^a	38.7		45.9		76		38	
Birth interval (months)								
First born	64	2.83*** (1.56–5.13)	62.5	1.4 (0.78–2.52)	76.5	1.01 (0.41–2.49)	50.6	1.14 (0.53–2.45)
≥24	51	1.66* (0.96–2.85)	58.4	1.18 (0.69–2.02)	71.2	0.77 (0.33–1.78)	40	0.74 (0.36–1.54)
<24 ^a	38.6		54.3		76.3		47.4	
Father's literacy								
Literate	61.4	3.05*** (2.01–4.63)	68.2	3.41*** (2.25–5.17)	76.7	1.65 (0.9–3.01)	43.8	0.87 (0.5–1.51)
Illiterate ^a	34.3		38.6		66.7		47.2	
Father's occupation								
Service/skilled	60.5	2.3*** (1.55–3.4)	67.1	2.51*** (1.69–3.72)	74.2	1.06 (0.59–1.89)	45.8	1.12 (0.67–1.88)
Unskilled ^a	40		44.8		73.1		43	
Food security								
Good	64.1	2.46*** (1.68–3.59)	71.7	2.92*** (1.98–4.32)	79.9	1.98** (1.12–3.52)	49.3	1.49 (0.9–2.47)
Poor ^a	42.1		46.5		66.7		39.5	
Wealth index								
1st/2nd quintile	77.2	5.93*** (3.87–9.06)	81	5.46*** (3.51–8.48)	79.4	1.66* (0.92–3.02)	52.9	1.76** (1.05–2.93)
3rd/4th/5th quintile ^a	36.3		43.8		69.9		39	
Family type								
Nuclear ^a	49	1.64** (1.1–2.45)	54.3	1.85*** (1.22–2.8)	68.5	2.36** (1.22–4.58)	42.6	1.29 (0.76–2.18)
Joint	61.2		68.7		83.7		48.8	
No. of people sleeping per room (crowding)								
2–3 per room	67.5	2.52*** (1.68–3.77)	66.9	1.67** (1.11–2.5)	79.3	1.58 (0.85–2.94)	54	1.78** (1.05–3.02)
4+ per room ^a	45.2		54.8		70.8		39.8	
Toilet facilities								
Improved	58.3	2.25*** (1.47–3.45)	67.1	3.52*** (2.27–5.44)	78	2.16** (1.18–3.98)	47.8	1.6 (0.9–2.86)
Open field ^a	38.3		36.7		62.1		36.4	
Drinking water								
Piped	65.7	2.1*** (1.38–3.2)	79.9	3.94*** (2.45–6.34)	77.5	1.34 (0.72–2.5)	53.8	1.71** (1–2.92)
Public tap/truck ^a	47.6		50.2		72		40.5	
Type of slum								
Listed	57.3	1.84*** (1.21–2.78)	65.6	2.62*** (1.72–3.98)	76.3	1.54 (0.84–2.82)	45.8	1.15 (0.66–2.01)
Unlisted ^a	42.2		42.2		67.6		42.3	

CI: confidence interval; OR: odds ratio; *: $P < 0.1$; **: $P < 0.05$; ***: $P < 0.01$.

^a Reference group

their counterparts in higher socioeconomic groups, and these subsequently affect their behaviour. Exposure to television and radio were found to be more effective than community events in raising awareness about hand-washing in Ghana.¹⁹ Media exposure has also proved to be an important factor for good feeding practices for children in India,² Ethiopia³ and Sri Lanka²⁰ and this underscores it as an important resource for women.

Autonomy in financial matters gives women the freedom to allocate money for items they consider important. Involvement in the family budget allows a woman to allocate resources for child-care equipment, and having money in her hand will allow her to use it for items such as soap when they are needed rather than depending on her husband. It will instil a sense of accountability in the mother that will positively affect the quality of child care. This is supported by a study proving that women's autonomy is beneficial for children's nutrition.²¹

Table 5. Predictors of satisfactory psychosocial stimulation and good hygienic care for children aged 6–59 months in the slums of Hyderabad, India: logistic regression (multivariate with alternative models)

Mothers' caregiving resources	Psychosocial stimulation				Hygienic care			
	Model 1 ^b , OR (95% CI)	P value	Model 2 ^c , OR (95% CI)	P value	Model 1 ^b , OR (95% CI)	P value	Model 2 ^c , OR (95% CI)	P value
Mother's age	–		–		1.10 (1.04–1.17)	0.00	1.11 (1.04–1.18)	0.00
BMI (kg/m ²)								
≥18.5					1.16 (0.72–1.87)	0.55	1.23 (0.74–2.06)	0.42
<18.5 ^a	–		–					
Literacy								
Literate	2.04 (1.34–3.13)	0.00	1.03 (0.62–1.71)	0.92	2.31 (1.51–3.54)	0.00	1.25 (0.76–2.06)	0.38
Illiterate ^a								
Media exposure								
Good	3.09 (1.95–4.88)	0.00	2.25 (1.35–3.77)	0.00	2.42 (1.51–3.88)	0.00	1.95 (1.15–3.29)	0.013
Average/poor ^a								
Satisfaction with life								
Yes	1.36 (0.81–2.3)	0.25	1.1 (0.62–1.96)	0.75	2.14 (1.27–3.61)	0.00	1.84 (1.05–3.24)	0.03
No ^a								
Leisure time/day								
2+ h	2.03 (1.09–3.78)	0.25	1.89 (0.97–3.68)	0.06	2 (1.17–3.42)	0.011	1.79 (1 – 3.18)	0.048
<2 h ^a								
Has money of their own to spend								
Yes	1.1 (0.7–1.82)	0.72	0.96 (0.55–1.67)	0.88	1.36 (0.87–2.13)	0.18	1.52 (0.95–2.45)	0.08
No ^a								
Participates in budgeting								
Yes	1.75 (1.06–2.89)	0.03	2.19 (1.25–3.83)	0.006	–		–	
No ^a								
Employed								
Yes	1.14 (0.6–2.3)	0.69	1.18 (0.59–2.37)	0.64	–		–	
No ^a								
Support from husband								
Yes	1.46 (0.97–2.2)	0.07	2.04 (1.28–3.24)	0.00	–		–	
No ^a								
Covariates: child, household characteristics								
Birth interval (months)								
First born			1.69 (0.77–3.72)	0.19			–	
≥24			2.14 (1.11–4.13)	0.02			–	
<24 ^a								
Birth order								
1/2			1.54 (0.89–2.67)	0.13			2.02 (1.16–3.51)	0.013
3+ ^a								
Father's literacy								
Literate			1.44 (0.68–1.91)	0.20			1.62 (0.95–2.76)	0.07
Illiterate ^a								
Father's occupation								
Service/skilled			1.16 (0.69–1.95)	0.58			0.94 (0.56–1.56)	0.81
Unskilled ^a								
Wealth index								
1st/2nd quintile			3.97 (2.24–7.05)	0.00			2.19 (1.25–3.83)	0.006
3/4/5th quintile ^a								
Family type								
Nuclear ^a			1.14 (0.68–1.91)	0.63			1.2 (0.72–2)	0.49
Joint								

Mothers' caregiving resources	Psychosocial stimulation			Hygienic care				
	Model 1 ^b , OR (95% CI)	P value	Model 2 ^c , OR (95% CI)	P value	Model 1 ^b , OR (95% CI)	P value	Model 2 ^c , OR (95% CI)	P value
No. of people sleeping per room (crowding)								
2–3			1.67				0.96	
4+ ^a			(0.94–2.98)	.08			(0.59–1.57)	0.86
Toilet								
Improved			1.2				1.53	
Open field ^a			(0.68–2.12)	0.53			(0.89–2.65)	0.13
Drinking-water								
Piped			1.02				2.11	
Not piped ^a			(0.59–1.77)	0.93			(1.2–3.71)	0.01

CI: confidence interval; OR: odds ratio.

^a Reference category; ^b Model 1: regression model with mother's caregiving resources alone; ^c Model 2: full model including child and household variables; –: not included in the regression models as these variables were not significant in bivariate analyses.

Support by the husband, shown to be a positive factor for psychosocial stimulation, is a morale booster for women, providing companionship and extra time, and thereby improving the quality of child care. Its effect was shown to be larger in the second model, reiterating that if child and family characteristics remain constant, support by the husband is an important determinant of the quality of child care. Socioeconomic status and parental education have been found to be consistently associated with HOME, both in this and earlier studies.^{17,22} Maternal literacy was not significant in this study, probably because the stimulation activities assessed are associated with a higher level of education, which is not the case in slums.

Mother's age, dissatisfaction with life and workload were also found to affect hygienic care. With each added year of maternal age, the odds of hygienic care being good increased 1.11 times. Very young women might not be physically and mentally ready for the additional responsibilities of child care and societal expectations of family life. Similarly, high workload deprives mothers of the much-needed time and energy for child care. When the mother feels happy or satisfied with life, it reflects the absence of stress and anxiety, and psychological well-being. The mother's mental health or presence of a mental disorder has been established as an important determinant of childhood infections and nutrition in countries including India, and the pathway for mental health to child health and nutrition will be through child care.^{23,24} The mother's satisfaction with life was found to be beneficial for hygiene in this study, and this suggests to the possibility of infections when satisfaction is lacking.

Minimum meal frequency and dietary diversity are indicators that measure the quantity and quality of complementary feeding of children 6–23 months old, which is the age when major growth problems occur. It was interesting that different sets of maternal resources were found to be connected with the two indicators in the bivariate analyses; this indicates that quantity and quality are decided by different maternal capabilities.

While age, literacy, workload, support by the husband and participation in budgeting showed a connection with meal frequency; media exposure, BMI, satisfaction, employment and participation in budgeting were loosely connected with dietary diversity. This is probably because dietary quantity needs time and support to use the food already available, while quality requires a conscious initiative from the mother. The multivariate analyses found workload and budget participation to be associated with meal frequency, but it did not find any maternal factor associated with dietary diversity. Financial autonomy has been proven to be beneficial for child feeding.²⁵

It was very hard for employed women in slums to find time for child care. Unsurprisingly, children belonging to nuclear families were at higher odds for not having minimum meals, which underscores the need for community support systems for working mothers in slums.

This study of a representative sample from the slum population of Hyderabad investigated caring practices of a fairly large age group of children (6–59 months). A major limitation was that there was only one observation set for all practices.

In order for the care received by slum children to be improved, their mothers should be exposed to the media and have more financial autonomy. Health messages through media and context-specific empowerment programmes might also help. Encouraging the husband's involvement in child care and mobilizing community support systems for slum women will also be beneficial.

A focus on caregiving practices without concern for resources might lead to the unfortunate result of accusing the mothers of inadequate child care, rather than recognizing a lack of resources available to them. Policy-makers will find the above-mentioned measures less capital intensive and more effective in building a resurgent slum populace.

Table 6. Predictors of minimum meal frequency and dietary diversity (≥ 3 food groups) in children aged 6–23 months in the slums of Hyderabad, India: logistic regression analysis (multivariate with alternative models)

Mothers' caregiving resources	Meal frequency				Dietary diversity			
	Model 1 ^b , OR (95% CI)	P value	Model 2 ^c , OR (95% CI)	P value	Model 1 ^b , OR (95% CI)	P value	Model 2 ^c , OR (95% CI)	P value
Mother's media exposure								
Good								
Average/poor ^a	–		–		1.61 (0.94–2.75)	0.085	1.26 (0.71–2.25)	0.43
BMI (kg/m ²)								
<18.5 ^a								
≥ 18.5	–		–		1.67 (0.94–2.3)	0.083	1.7 (0.92–3.13)	0.09
Satisfaction with life								
Yes								
No ^a	–		–		1.27 (0.63–2.57)	0.5	1.4 (0.66–2.97)	0.38
Employed								
Yes								
No ^a	–		–		1.59 (0.71–3.52)	0.26	1.75 (0.75–4.1)	0.2
Participates in budgeting								
No ^a								
Yes	1.66 (0.91–3.03)	0.098	1.97 (1–3.86)	0.049	1.32 (0.76–2.28)	0.33	1.31 (0.73–2.35)	0.37
Mother's age	1.05 (0.97–1.14)	0.23	1.06 (0.97–1.17)	0.21	–		–	
Literacy								
Literate								
Illiterate ^a	1.43 (0.8–2.57)	0.23	1.08 (0.52–2.24)	0.83	–		–	
Leisure time/day								
2+ h								
<2 h ^a	2.47 (1.2–5.07)	0.014	2.75 (1.25–6.06)	0.012	–		–	
Support from husband								
Yes								
No ^a	1.21 (0.68–2.18)	0.52	1.20 (0.63–2.3)	0.58	–		–	
Covariates: child, household characteristics								
Father's literacy								
Literate								
Illiterate ^a			1.44 (0.67–3.12)	0.35			–	
Family type								
Nuclear ^a								
Joint			2.9 (1.36–6.2)	0.006			–	
Child's birth order								
1 or 2								
3+ ^a			—				1.08 (0.53–2.21)	0.84
Age of the child			1.15 (1.07–1.24)	0.00			1.12 (1.06–1.19)	0.00
Food security [†]								
Good								
Poor ^a			1.65 (0.86–3.17)	0.13			1.36 (0.77–2.4)	0.29
No. of people sleeping per room (crowding)								
2–3								
4+ ^a			1.32 (0.65–2.67)	0.44			1.68 (0.94–2.3)	0.08
Type of slum								
Listed								
Unlisted ^a			1.05 (0.5–2.2)	0.91			1.14 (0.62–2.08)	0.67

CI: confidence interval; OR: odds ratio.

^a Reference category; ^b Model 1: regression model with mother's caregiving resources alone; ^c Model 2: full model including child and household variables; –: not included in the regression models as these variables were not significant in bivariate analyses.

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