

Research Analysis on Family Caregiving for Infants and Toddlers Aged 6–36 Months in Tianhe District, Guangzhou

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Abstract: *Objective:* To understand the current status and influencing factors of family caregiving for infants and toddlers aged 6–36 months in Tianhe District, Guangzhou City, with the aim of better comprehending the physiological and psychological needs of infants and toddlers, and assisting families in developing effective intervention measures and support strategies. *Methods:* In November 2024, a random sample of 311 infants and toddlers aged 6–36 months from the permanent resident population in Tianhe District, Guangzhou City, was selected. Caregivers were surveyed using a questionnaire regarding family caregiving practices for infants and toddlers. The Kruskal-Wallis's test, Mann-Whitney test, and multiple linear regression analysis were employed to examine the influencing factors of family caregiving for infants and toddlers. *Results:* The findings indicate that the quality of family caregiving is significantly influenced by the educational level of the parents ($p < 0.001$) and the annual household income ($p < 0.001$). Work-family conflict showed a significant negative correlation with the quality of family caregiving ($\beta = -0.239, p < 0.001$), while family atmosphere demonstrated a significant positive correlation with the quality of family caregiving ($\beta = 0.225, p < 0.001$). *Conclusion:* In Tianhe District, Guangzhou City, the quality of infant and toddler caregiving is determined by a combination of key factors, including annual household income, parental educational background, work-family conflict, and family atmosphere. These elements collectively form the core determinants of caregiving practices for infants and toddlers.

Keywords: Infants and toddlers, Family caregiving, Work-family conflict

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1. Introduction

Based on scientific research in early childhood development and the pressing caregiving challenges faced by families, the socialization process of infants and toddlers begins within the family ^[1,2]. The family is the most crucial microsystem for children under three years old ^[3]. Stable and supportive relationships with parents help foster a sense of trust, promote social and emotional development, and facilitate the building of positive

relationships with others. Parents also need support to provide a healthy start in life for their children.

In 2019, the “General Office of the State Council issued the Guiding Opinions on Promoting the Development of Care Services for Infants and Toddlers Under the Age of Three, which emphasized the principle of “family-led care with institutional support”^[4]. The core aim is to offer scientific parenting guidance to families and provide necessary services to those with caregiving difficulties^[5]. Against this background, this study investigates the caregiving status of infants and toddlers aged 6–36 months in Tianhe District, Guangzhou, to provide evidence-based support for family caregiving strategies.

2. Method

2.1. Participants

This study employed stratified random sampling to select families with infants and toddlers aged 6–36 months from the permanent resident population in Tianhe District, Guangzhou.

2.1.1. Inclusion criteria

Infants and toddlers who had resided in the district for more than six months.

2.1.2. Exclusion criteria

- (1) Infants and toddlers with congenital diseases;
- (2) Caregivers with hearing or communication impairments.

A total of 311 questionnaires were distributed. After rigorous screening to remove cases with age mismatches or non-resident caregivers, 308 valid responses were obtained for analysis.

2.2. Questionnaire design

A self-designed questionnaire was used, based on guidelines from the Outline for the Development of Chinese Women and Children and the Health Care Guidelines for Children Under Age Three^[6].

It covered multiple dimensions, including:

- (1) Basic child information: gender, age in months, feeding methods, etc.
- (2) Family caregiving details: caregiver identity such as parents, grandparents, nannies, education level, household income.
- (3) Work-Family Conflict Scale (WFCS): Has good reliability (Cronbach’s $\alpha = 0.89$), to evaluate the caregiver’s experience of work-family conflict^[7].
- (4) Health monitoring: including immunization status, growth and development indicators.

Questionnaires were distributed both online (via Wenjuanxing platform) and offline (through community clinics and kindergartens). All forms were completed under the guidance of trained investigators to ensure data accuracy.

2.3. Statistical analysis

Data were analyzed using SPSS version 26.0. Since the demographic variables were non-normally distributed, medians and interquartile ranges [M (P25, P75)] were used for descriptive statistics. Group comparisons were conducted using the Kruskal-Wallis H test and the Mann-Whitney U test. Multiple linear regression was applied to identify influencing factors. A one-tailed test with $p < 0.05$ was considered statistically significant.

3. Results

3.1. Demographic characteristics

A total of 311 questionnaires were distributed, of which 308 were valid. Among the caregivers, 84.7% were parents, and 8.1% were grandparents or nannies. The gender distribution of infants and toddlers was 48.1% male and 51.9% female. Regarding education, 42.5% of fathers and 40.3% of mothers held a bachelor's degree or higher. In terms of annual household income, 24.9% of families earned ¥50,000–100,000, and 12.9% earned more than ¥1,000,000 (refer to **Table 1**).

Table 1. Basic demographic characteristics

Variable	Category	Frequency	Percentage
Primary Caregiver	Parents	261	84.7
	Maternal grandparents	12	3.9
	Nanny	13	4.2
	Others	14	4.5
Child's Gender	Male	148	48.1
	Female	160	51.9
Father's Education	Junior high school or below	26	8.4
	High school	63	20.5
	Junior college	88	28.6
	Bachelor's degree or above	131	42.5
Mother's Education	Junior high school or below	22	7.1
	High school	61	19.8
	Junior college	101	32.8
	Bachelor's degree or above	124	40.3
Annual Household Income	Less than ¥100,000	45	14.6
	¥100,000–¥300,000	78	25.2
	¥300,000–¥500,000	69	22.3
	¥500,000–¥1,000,000	77	24.9
	Over ¥1,000,000	40	12.9

3.2. General family caregiving practices

The survey revealed several important aspects of child health practices among caregivers. With regard to complementary feeding, 21.1% of children were introduced to complementary foods before 4 months of age, 16.9% between 4 and 6 months, and 21.8% between 6 and 8 months. In terms of vitamin D supplementation, 39.4% of caregivers reported initiation within 14 days of birth, 18.2% between 14 and 30 days, 20.5% between 1 and 12 months, 18.2% after 12 months, while 24.0% reported never providing supplementation. For regular health check-ups, only 27.3% consistently conducted growth and development monitoring, whereas 21.8% never engaged in such practices. With respect to vaccination, just 19.5% of children were reported to have received all scheduled immunizations on time. Regarding oral health practices, 23.1% of children began tooth brushing

with the eruption of the first tooth, 26.3% after the full eruption of upper and lower teeth, and 26.9% only during tooth replacement. Sleep quality assessments indicated that 49.0% of children experienced poor nighttime sleep, while 51.0% were reported to sleep well. For emergency knowledge, 18.2% of caregivers had never heard of cardiopulmonary resuscitation (CPR) and 20.5% demonstrated good mastery; similarly, 19.8% had never heard of the Heimlich maneuver, while 22.7% reported good mastery. Finally, in terms of safety device use, only 23.7% of families demonstrated good adherence to child safety seat or helmet use, whereas 26.6% and 26.9% reported poor and relatively poor usage, respectively (refer **Table 2**).

Table 2. General distribution of infant and toddler home care practices

Variable	Category	Frequency	Percentage
Introduction of Complementary Foods	Before 4 months	65	21.1
	4–6 months	52	16.9
	6–8 months	67	21.8
Timing of Vitamin D Supplementation	Never supplemented	74	24
	After 12 months of age	56	18.2
	Within 1–12 months of age	63	20.5
	Within 14–30 days after birth	56	18.2
	Within 14 days after birth	59	19.2
Regular Growth Monitoring at Health Institutions	Never	67	21.8
	Occasionally (< 50% of the time)	75	24.4
	Mostly (> 50% of the time)	82	26.6
	Always	84	27.3
Immunization Status	Never vaccinated on time	67	21.8
	Vaccinated but not on schedule	58	18.8
	Less than half on time	60	19.5
	More than half on time	63	20.5
	Fully on time	60	19.5
When Child Began Brushing Teeth	After permanent teeth eruption	83	26.9
	After both upper and lower teeth erupted	81	26.3
	After more than three teeth erupted	73	23.7
	After first tooth erupted	71	23.1
Nighttime Sleep Quality (6–36 months)	Poor sleep quality	151	49
	Good sleep quality	157	51
Caregiver's Knowledge of Infant CPR	Never heard of it	56	18.2
	Heard but not proficient	71	23.1
	Poor proficiency	58	18.8
	Good proficiency	63	20.5
	Good proficiency	60	19.5

Table 2 (Continued)

Variable	Category	Frequency	Percentage
Caregiver's Knowledge of Infant Heimlich Maneuver	Never heard of it	61	19.8
	Heard but not proficient	51	16.6
	Poor proficiency	68	22.1
	Good proficiency	58	18.8
	Good proficiency	70	22.7
Use of Child Safety Seats or Helmets	Poor	82	26.6
	Relatively poor	83	26.9
	Average	70	22.7
	Good	73	23.7

3.3. Gender and household registration vs. family caregiving

Mann-Whitney U tests revealed no statistically significant differences in caregiving quality based on the child's gender ($p = 0.353$) or household registration status ($p = 0.444$) (refer **Table 3**). Kruskal-Wallis tests showed that both paternal and maternal education levels were significantly associated with caregiving quality ($p < 0.001$). The average caregiving scores increased progressively with higher education levels.

Table 3. Comparison of childcare practices by gender and residency status

Variable	Mann-Whitney U	Wilcoxon W	Z	Asymptotic Sig. (2-tailed)
Gender	11116	22142	-0.928	0.353
Residency Status	11243	24123.5	-0.765	0.444

Similarly, household income had a significant effect on caregiving quality ($H = 130.65$, $p < 0.001$), with caregiving scores increasing along with income levels. Families with income above ¥1,000,000 had the highest average ranks, while those below ¥100,000 had the lowest (refer **Table 4**).

Table 4. Comparison of childcare practices by parental education and household income

Group	Mean Rank	Kruskal-Wallis H	df	Asymptotic Sig.
Father: Junior high or below	71.52	73.509	3	0.00**
Father: High school	101.19			
Father: Junior college	155.7			
Father: Bachelor's or above	195.8			
Mother: Junior high or below	60.48	63.612	4	
Mother: High school	109.29			
Mother: Junior college	154.98			
Mother: Bachelor's or above	193.03			
Income: < ¥100,000	73.56	130.65		

Table 4 (Continued)

Group	Mean Rank	Kruskal-Wallis H	df	Asymptotic Sig.
Income: ¥100,000–¥300,000	101.76			
Income: ¥300,000–¥500,000	154.72			
Income: ¥500,000–¥1,000,000	210.92			
Income: > ¥1,000,000	238.11			

3.4. Regression analysis: Factors affecting family caregiving

A multiple linear regression model was constructed to examine the factors influencing caregiving quality. The model yielded an R^2 value of 0.251, suggesting that approximately 25.1% of the variance in caregiving quality could be explained by the included predictors (Refer **Table 5**). Among the independent variables, work–family conflict demonstrated a significant negative effect on caregiving quality ($\beta = -0.239$, $p < 0.001$), whereas family atmosphere exerted a significant positive effect ($\beta = 0.225$, $p < 0.001$). Multicollinearity diagnostics indicated no concerns, as all variance inflation factor (VIF) values were below 5. The Durbin–Watson statistic was 0.791, supporting the assumption of independence of residuals. Based on the estimated coefficients, the regression equation was expressed as: Caregiving Quality = $22.874 - 0.239 \times \text{Work-Family Conflict} + 0.225 \times \text{Family Atmosphere}$

Table 5. Analysis of factors associated with childcare practices

Variable	Regression Coefficient	<i>t</i> -value	Significance	VIF
Constant	22.874	5.77	0.00**	
Work-Family Conflict Scale	-0.239	-5.474		1.035
Family Atmosphere Scale	0.225	7.336		
F-value	51.026			
Adjusted R^2	0.251			
Durbin-Watson	0.791			

4. Discussion

Family caregiving is an essential support for infant and toddler growth, profoundly affecting their physiological, psychological, and cognitive development ^[8]. Cai Yingna et al. found that family nurturing quality significantly impacts infant development, further emphasizing the role of family caregiving in early development ^[9]. Yin Chunlan, Xi Xiangyun et al. found that families have certain guidance needs for infant nurturing, indicating that family members, especially parents and grandparents, need more support and guidance to improve their nurturing abilities ^[10]. Meanwhile, the choice of infant care methods directly affects infant growth.

4.1. Relationship between general family factors and infant nurturing

This study involved 308 infants and toddlers in Tianhe District, Guangzhou, investigating family caregiving situations including complementary food addition, vitamin D supplementation, regular growth and development monitoring, vaccination, and infant nighttime sleep. According to the “Health Care Guidelines for Infants

and Toddlers Under 3 Years Old (Trial), teeth cleaning should begin when the first deciduous tooth erupts; complementary foods should be added from 6 months; full-term infants should start receiving 400 IU of vitamin D daily under medical guidance within days after birth to promote growth and development; caregivers should regularly take infants for health management under the National Basic Public Health Service Project for children aged 0–6 years, with infants under 1 year monitored at 1 week after discharge, 1 month, 3 months, 6 months, 8 months, and 12 months, and toddlers aged 1–3 years monitored at 18 months, 24 months, 30 months, and 36 months to detect health issues such as emaciation, overweight, obesity, developmental delay, anemia, vitamin D deficiency leading to rickets, eye diseases, hearing impairments, and dental caries early, find causes, and intervene promptly ^[11].

The survey results found that infant care work in Tianhe District, Guangzhou still has significant room for improvement in several key areas. There are still issues with insufficient vitamin D supplementation compliance, inadequate regular growth monitoring implementation, low vaccination timeliness, lack of oral care during deciduous tooth eruption, significant sleep quality differentiation, significant deficiencies in safety rescue capabilities, and low prevalence of child safety devices. From the perspective of nurturing subjects, knowledge-behavior transformation barriers are the primary cause. Although most interviewed parents know the importance of vitamin D supplementation, the actual regular supplementation rate is only 19.2%.

Meanwhile, families show obvious lag in infant oral care, with 76.9% of families starting tooth cleaning only after the third tooth erupts, which deviates from the guideline requirement of “cleaning begins with the first deciduous tooth,” suggesting that the timeliness and continuity of oral care in family’s needs strengthening. The good rate of child safety seat use is only 23.7%, possibly limited by economic burden and installation technical barriers. This phenomenon forms a paradox with the regional economic development level, reflecting insufficient depth of safety awareness popularization. For the above situations, this study proposes multi-level intervention strategies: First, construct a three-dimensional health education network of “hospital-community-family,” develop personalized nurturing guidance systems based on artificial intelligence, and enhance caregivers’ scientific literacy through scenario simulation training; Second, optimize child health service supply models, implement flexible appointment systems, extend weekend reception hours, and establish green channels for vaccination catch-up; Third, include vitamin D supplements in basic public health service packages and enhance accessibility through distribution at community pharmacies; Fourth, strengthen scientific oral care promotion through community activities to improve caregivers’ awareness of oral care importance and mastery of correct operational skills; Fifth, implement subsidy policies for child safety device purchases and conduct public welfare projects in conjunction with enterprises; Sixth, develop dynamic monitoring apps for infant sleep quality and provide real-time intervention suggestions combined with wearable devices.

Analysis of collected data indicates that caregivers’ educational level has significant differences in infant care quality, possibly related to how educational background enhances scientific parenting knowledge acquisition ability and information discrimination level. Meanwhile, family care level differs with income, indicating that economically better-off families can provide higher quality care resources and environments for infants.

These finding echoes existing research conclusions, such as Hong Xiumin’s research finding that high-income families often provide more comprehensive and detailed infant care. Additionally, it points out that mothers with higher education pay more attention to children’s early development and are more willing to send children to childcare institutions for professional care and early education. This is consistent with our research results, further confirming the important influence of parental education and income on family infant care.

Therefore, improving parents' educational level and family economic conditions are effective ways to improve infant care quality. Government and society should increase support for low-income families and highly educated families by providing economic assistance, educational resources, etc., to promote balanced development of infant care services. Especially in the rural revitalization strategy, rural parents' continuing education projects should be strengthened to compensate for insufficient economic capital through an "educational compensation" mechanism.

4.2. Relationship between work-family conflict, family atmosphere and infant nurturing

Modern society's occupational pressures profoundly impact parenting practices. Research results show that work-family conflict negatively correlates with infant care quality, meaning greater work-family conflict leads to lower infant care quality. This finding emphasizes the importance of parents' balance between work and family for infants' healthy growth. When parents face greater work pressure and time conflicts, they may be unable to provide sufficient attention and care for infants, affecting their physical and mental development. Conversely, family atmosphere positively correlates with infant care quality. This indicates that a warm, harmonious, loving family atmosphere can provide a good growth environment for infants, helping them form positive character traits and healthy psychological states. In such families, infants receive more love and support, thus enjoying higher quality care. Hong Xiumin, Shi Zhilei, and other authors' research indicates that greater work-family conflict may lead to less parental investment in infant care, resulting in lower care quality. When the family atmosphere is harmonious and positive, infants feel more love and support, and their care quality improves accordingly ^[12,13]. This is basically consistent with our survey results.

In families facing higher work-family conflicts, infant care is often not detailed and comprehensive enough. In families with good family atmospheres, infants not only receive better material care but also sufficient emotional satisfaction, helping them form healthy psychology and personality. Meanwhile, comparing with several other studies, we conducted in-depth analysis from the aspects of work-family conflict and family atmosphere. Regarding work-family conflict, our research is consistent with most research conclusions, all pointing out its negative impact on infant care quality; regarding family atmosphere, although different studies differ in details, they all emphasize its positive role overall. Based on these findings, we propose the following guiding opinions:

- (1) Promote family-friendly policies at the institutional design level, including implementing parenting guidelines, establishing community temporary infant care centers and other public service facilities, and reducing work-family role conflicts through policy support.
- (2) Advocate responsibility sharing mechanisms among family members, establish visualization tools for parenting task allocation, set daily family emotional communication time, enhance family cohesion through parent-child activities, and create a harmonious, positive atmosphere.
- (3) Encourage enterprises to support parenting plans and provide services such as time management training and remote work options for working parents.

Additionally, the two standardized assessment tools used in this study, the Work-Family Conflict Scale and Family Atmosphere Scale, and have important practical value in family function diagnosis and parenting guidance. These two scales can objectively reflect families' actual situations in work and atmosphere, providing targeted guidance and suggestions for families. Through regular use of these two scales for assessment, caregivers can timely identify potential risks in family system operation and implement targeted intervention strategies based on assessment feedback, effectively improving infant nurturing quality.

5. Summary and outlook

This study reveals the multidimensional influence mechanism of the family system on infant care quality, confirming that work-family conflict constitutes a significant obstacle factor, while family atmosphere, caregiver education level, and economic foundation play positive support.

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