Proceedings of Business and Economic Studies, 2026, Volume 9, Issue 6
http://ojs.bbwpublisher.com/index.php/PBES
Online ISSN: 2209-265X
Print ISSN: 2209-2641

Research on Differentiated Characteristics and Collaborative Optimization of Child-Friendly Facility Demands in Parent-Child Tourism in Chongqing

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Abstract: Driven by demographic structural changes and an upgrade in quality consumption, the parent-child tourism market is transitioning from extensive supply to refined services. Child-friendly facilities are key carriers for enhancing the parent-child tourism experience, with their demands showing significant differentiation across various family structures. Existing research often treats "families" as homogeneous entities, overlooking the demand variations arising from differences in family structures. This study takes Chongqing, a mountain city, as a case study, focusing on four types of families: those with multiple children, intergenerational combinations, single-parent families, and dual-income core families. It employs a mixed-methods approach to reveal the differentiated patterns of demand for child-friendly facilities, identifying four core issues such as supply-demand mismatch and inadequate terrain adaptation. Based on these findings, optimization paths are proposed from four dimensions, including facility layout and service design, providing practical guidance for the high-quality development of parent-child tourism in Chongqing and similar mountainous cities.

Keywords: Parent-child tourism; Child-friendly facilities; Demand differentiation; Collaborative optimization

Online publication: July 15, 2026

1. Introduction

The report of the 20th National Congress of the Communist Party of China explicitly proposes to "promote the in-depth integration and development of culture and tourism," with refined and humanized tourism services being an inherent requirement for the high-quality development of the industry [1]. With the implementation of the "three-child" policy and the deepening of population aging, family forms are becoming increasingly diverse, and parent-child tourism has emerged as a core force driving cultural and tourism consumption. Chongqing, known as the "Mountain City," attracts a large number of parent-child tourists with its unique terrain and cultural resources. However, the city's hilly topography poses special challenges for the construction of child-

friendly facilities [2].

Currently, the construction of child-friendly facilities for parent-child tourism in Chongqing tends to be "supply-oriented," neglecting the demand variations among different families, such as those with multiple children and intergenerational combinations [3]. This has resulted in low utilization rates of facilities and low tourist satisfaction.

Theoretically, existing research primarily focuses on universal facility standards for child-friendly cities or scenic spots, such as Cao *et al.*'s attention to inclusive design of community public playgrounds under grandparenting [4], and Zhong *et al.*'s exploration of the relationship between parent-child tourism and children's growth [5,6]. However, there is a scarcity of research on the differentiated demands for child-friendly facilities from the perspective of family structure typology. Practically, Chongqing has yet to establish a standard system for child-friendly facilities that caters to the diverse needs of different families, with the issue of inadequate adaptation of facility construction to the mountainous terrain being particularly prominent.

Therefore, clarifying the facility demand characteristics of different family structures and resolving supply-demand conflicts hold significant theoretical and practical implications for the transformation and upgrading of parent-child tourism in Chongqing.

2. Current situation survey of child-friendly facilities in parent-child tourism in Chongqing

2.1. Online text analysis

This study employed Python web crawling tools to collect user reviews, travelogues, and social media updates related to "parent-child travel in Chongqing" from mainstream platforms such as Ctrip, Dianping, Weibo, and Mafengwo, spanning from January 2024 to December 2025. The data collection process strictly adhered to platform rules. After cleaning the collected texts by removing advertisements, meaningless repetitions, and information unrelated to parent-child facilities, a total of 98,500 valid characters were obtained, encompassing 1,459 reviews, 84 travelogues, and 917 social media updates.

ROST CM6 software was utilized to conduct word frequency analysis and semantic network analysis on these valid texts. The statistical results of high-frequency words (**Table 1**) revealed that terms such as "safety," "climbing slopes," "inconvenience of strollers," "crowdedness," "steps," "rest areas," "nursing rooms," "protection," "adaptability," "multiple children," and "intergenerational" emerged as core concerns. These words collectively accounted for 41.2% of the total word frequency, initially uncovering key contradictions in the facilities concerning "terrain adaptability," "spatial layout," "safety guarantees," and "functional adaptability." Semantic network analysis indicated a strong correlation between "inconvenience of strollers" and "numerous steps" and "steep ramps," a close connection between "safety concerns" and "children running around" and "lack of protection," and a significant association cluster between "poor experience" and "crowdedness" and "few rest areas." These findings also provided clear directions for subsequent questionnaire surveys and in-depth interviews.

Table 1. Statistics of high-frequency words related to child-friendly facilities in parent-child tourism in Chongqing (top 30)

Rank	High-frequency term	Frequency	Rank	High-frequency term	Frequency	Rank	High-frequency term	Frequency
1	Safety	896	11	Baby care room	215	21	Protection	103

Rank	High-frequency term	Frequency	Rank	High-frequency term	Frequency	Rank	High-frequency term	Frequency
2	Slope climbing	763	12	Queuing	208	22	Convenience	98
3	Stroller inconvenience	689	13	Play facilities	196	23	Multiple children	95
4	Crowdedness	612	14	Education	187	24	Intergenerational	91
5	Stairs	578	15	Interaction	179	25	Single parent	89
6	Rest area	453	16	Hygiene	168	26	Nuclear family	86
7	Children	427	17	Adaptability	156	27	Signage	83
8	Family	398	18	Science popularization	149	28	Accessibility	81
9	Scenic spot	356	19	Service	137	29	Temporary childcare	78
10	Play	321	20	Cleanliness	124	30	Culture	75

2.2. Questionnaire survey and data analysis

2.2.1. Questionnaire design and distribution

Based on the analysis of online texts and referencing Li *et al.*'s research scale on parent-child tourism [7], the "Questionnaire on the Demand for Child-Friendly Facilities in Chongqing Parent-Child Tourism" was designed. The questionnaire mainly consists of three parts: The first part covers basic family information, including family structure types (clearly distinguishing four categories: A, B, C, and D), children's ages, travel frequency, etc.; The second part employs a Likert five-point scale (1 = not at all important, 5 = very important) to measure the perceived importance of the needs of the four types of families across four dimensions: basic convenience facilities, safety support facilities, educational and entertainment facilities, and service support facilities [8]; The third part consists of open-ended questions to collect specific suggestions from families regarding child-friendly facilities.

Using quota sampling, a total of 1,300 questionnaires were distributed from September to October 2025 at popular parent-child attractions in Chongqing, including Hongya Cave, Chongqing Zoo, Happy Valley, Xiannv Mountain, and the Three Gorges Museum, targeting families of types A, B, C, and D. During the survey, trained investigators provided on-site guidance to ensure the quality of questionnaire completion. Ultimately, 1,238 questionnaires were collected, and after screening and removing invalid questionnaires (due to logical contradictions or incomplete filling), 1,215 valid questionnaires were obtained, with an effective rate of 93.5%. The sample composition was as follows: 304 questionnaires (25.0%) from multi-child families of type A, 303 questionnaires (24.9%) from intergenerational families of type B, 208 questionnaires (17.1%) from single-parent families of type C, and 400 questionnaires (32.9%) from dual-income nuclear families of type D. The sample size was balanced and consistent with the actual distribution of family structures in Chongqing, demonstrating good representativeness.

2.2.2. Reliability and validity testing

SPSS 25.0 was used to test the reliability and validity of the questionnaire data. The results showed that the overall Cronbach's α coefficient of the questionnaire was 0.923, with α coefficients of 0.876 for the basic convenience facilities dimension, 0.854 for the safety support facilities dimension, 0.837 for the educational and entertainment facilities dimension, and 0.842 for the service support facilities dimension, all exceeding the critical value of 0.8, indicating good reliability of the questionnaire. Exploratory factor analysis (EFA) was conducted to test validity, with a KMO value of 0.896 and a Bartlett's test of sphericity $\chi^2=7862.354$ ($p<0.001$),

indicating suitability for factor analysis. Four common factors were extracted, with a cumulative variance explanation rate of 68.73%, and all item factor loadings were greater than 0.6, indicating good structural validity of the questionnaire.

2.2.3. Data analysis results

One-way analysis of variance (ANOVA) was used to test the differences in the needs for child-friendly facilities across the four dimensions among the four types of families. The results showed significant differences among the four types of families in the dimensions of basic convenience facilities ($F = 42.357$, $P < 0.001$), safety support facilities ($F = 38.624$, $P < 0.001$), educational and entertainment facilities ($F = 29.785$, $P < 0.001$), and service support facilities ($F = 35.219$, $P < 0.001$).

Further analysis of specific differences through post-hoc multiple comparisons (LSD method) revealed that multi-child families of type A scored the highest in the demand for educational and entertainment facilities (such as all-age playgrounds and science popularization interactive facilities) (4.43 ± 0.51); intergenerational families of type B scored the highest in the demand for safety support facilities (such as guardrails and rest areas) (4.58 ± 0.49); single-parent families of type C scored the highest in the demand for service support facilities (such as temporary childcare and safety monitoring) (4.39 ± 0.54); and dual-income nuclear families of type D scored relatively high in the demand for basic convenience facilities (such as nursing rooms and barrier-free access) (4.37 ± 0.48).

2.3. In-depth interviews and non-participant observation

2.3.1. In-depth interviews

To deepen the quantitative research findings, this study conducted in-depth interviews with 32 groups of different types of parent-child families (8 groups each of types A, B, C, and D) and 12 industry practitioners (4 attraction operation managers, 3 travel agency product managers, and 5 parent-child homestay operators). The interviews were semi-structured, with the family interview outline focusing on pain points in facility use, core needs, and improvement suggestions; and the practitioner interview outline focusing on difficulties in facility planning, operational challenges, and industry trends. Each interview lasted 30-60 minutes, was recorded with the consent of the interviewees, and was promptly transcribed into text after the interview, ultimately forming approximately 120,000 words of interview data.

The interview results showed that multi-child families of type A generally reported that “existing playgrounds are mostly designed for a single age group, making it difficult for siblings to participate simultaneously, and the educational content lacks hierarchy”; elderly individuals in intergenerational families of type B repeatedly mentioned that “children run frequently in the attraction, lacking necessary protective facilities, raising concerns about collision risks, and the distance between rest areas is too large, making it difficult to maintain physical strength”; single-parent families of type C indicated that “there is a lack of temporary childcare points and convenient storage facilities, making it impossible to take care of both rest and shopping when bringing children alone, and the safety monitoring coverage is incomplete”; and dual-income nuclear families of type D hoped to “increase personalized guided tour services and nursing room configurations to enhance the convenience and flexibility of tourism.”

2.3.2. Non-participant observation

Non-participant observation was conducted at five typical case sites in Chongqing, including the Chongqing

Zoo, Hongya Cave, Happy Valley, Xiannv Mountain, and the Three Gorges Museum, with a cumulative observation duration of at least three days at each site, covering different time periods on weekends, holidays, and weekdays.

The observation content included the types, quantities, layouts, usage, and maintenance status of child-friendly facilities, with a focus on recording the facility usage behaviors and interaction processes of the four types of families. The observations revealed that the number of nursing rooms in the core visiting areas of the Chongqing Zoo was insufficient, with families of types A and D having to wait in line for 15–20 minutes during peak periods, and some nursing rooms lacked basic equipment such as bottle warmers and diaper changing tables. The park had many stairs connecting various animal enclosures, lacking convenient stroller-specific ramps, often requiring strollers to be carried up and down the stairs, resulting in significant physical exertion; the core visiting route from the 11th floor to the 1st floor of Hongya Cave had a stair slope of 25°, lacking stroller-specific passages, forcing families of types B and D to carry young children or shoulder strollers; the hiking routes in Xiannv Mountain had rest areas spaced too far apart, causing elderly individuals in families of type B to frequently stop midway due to physical exhaustion; the educational and entertainment facilities in the Three Gorges Museum lacked age-stratified design, only suitable for children aged 3–6, with children aged 7–12 in families of type A commonly experiencing boredom and waiting; and families of type C had no temporary childcare points in all attractions, requiring parents to carry their children with them at all times when dining or using the restroom. The observation results corroborated the findings from online text analysis and questionnaire surveys, achieving triangular validation.

3. Core issues with child-friendly facilities in Chongqing's parent-child tourism

3.1. Supply-demand mismatch: Facility supply fails to meet family needs

Currently, the construction of child-friendly facilities in Chongqing's parent-child tourism exhibits a significant "one-size-fits-all" phenomenon, severely neglecting the heterogeneous needs of families. Questionnaire surveys and interviews indicate that the core needs of the four types of families differ significantly, yet facility supply lacks targeted adaptation [9].

Multi-child families of type A have a strong demand for educational and entertainment facilities for all age groups, but existing facilities are mostly designed for children aged 3–6, lacking specialized facilities for infants and toddlers (0–3 years old) and school-age children (7–12 years old) [10]. The educational content is highly homogeneous, making it difficult to meet the hierarchical needs of multi-child families. Additionally, family restrooms are cramped, accommodating only one child at a time, and some facilities do not offer preferential policies for multiple children, requiring additional fees for each extra child.

Intergenerational families of type B have the most prominent demand for safety protection facilities and rest areas, but the guardrails in children's activity areas within attractions are sparsely set, with some water areas and steep slope regions lacking protective facilities. The number of rest areas is insufficient, and most are ordinary seats without considering the suitability for the elderly and children, lacking composite rest spaces with caregiving functions [11]. Moreover, the travel routes have steep slopes without assistance facilities, resulting in significant physical exertion for the elderly and children.

Single-parent families of type C have an urgent demand for safety guarantees and service support, but safety monitoring within attractions is incomplete, with no emergency call buttons in marginal areas. There is a lack of temporary care points and convenient storage facilities, making it impossible for single-parent families

to take care of both rest and shopping when bringing children alone. Social interaction facilities are insufficient, leaving children without peers of the same age [12].

Dual-income nuclear families of type D have a high demand for basic convenience facilities, but the coverage rate of nursing rooms is less than 40%, mostly concentrated in the entrance areas of attractions, with severe shortages in core visiting areas and marginal regions. The equipment configuration is incomplete, with nearly 30% of nursing rooms lacking hot water supply and having damaged diaper changing tables unrepaired [13]. The design of barrier-free access is unreasonable, with ramp slopes exceeding 15° (the safe slope threshold for stroller pushing) and some older attractions even lacking barrier-free access.

3.2. Inadequate terrain adaptation: Mountain city characteristics not effectively addressed

The topographical features of Chongqing as a "mountain city" (characterized by dense stairs, steep slopes, and complex terrain) are the core contributing factors to the contradictions in the use of child-friendly facilities. In network text analysis, negative terms such as "tiring climbs," "inconvenient strollers," and "numerous stairs" appeared a cumulative total of 2,029 times, becoming the primary topographical factor affecting the parent-child tourism experience.

3.2.1. Prominent accessibility obstacles

Non-participant observation revealed that most attractions did not fully consider terrain connectivity in facility planning: In older urban attractions like Hongya Cave and Ciqikou, the core visiting routes are densely packed with stairs, lacking stroller-specific passages, forcing families of types B and D to frequently lift strollers, resulting in significant physical exertion. In mountainous attractions like Xiannv Mountain and Jinfo Mountain, the hiking routes have steep slopes without assistance facilities, causing elderly individuals in families of type B to frequently stop midway due to physical exhaustion, and making it even more difficult for multi-child families of type A to climb slopes while caring for multiple children [14]. Some attractions have significant elevation differences between parking lots and core visiting areas, lacking convenient shuttle facilities, requiring all four types of families to carry heavy luggage uphill, resulting in a poor experience.

3.2.2. Imbalanced layout

Due to terrain limitations, child-friendly facilities are mostly concentrated in flat areas of attractions, with severe shortages in steep and marginal regions, forming a supply pattern of "core congestion and marginal vacancy," further exacerbating usage contradictions among the four types of families [15].

3.3. Homogenized services: Lack of personalization and innovation

The service content of child-friendly facilities in Chongqing's parent-child tourism exhibits a high degree of homogenization, lacking personalized design for families of types A, B, C, and D, and failing to meet differentiated needs. Guided tour services in attractions mostly use unified scripts, lacking hierarchy, being too profound for young children and too superficial for school-age children. Interactive projects are mostly simple handicrafts and game experiences, lacking deep integration with Chongqing's local culture and failing to consider the participation ability differences among the four types of families [16].

Multi-child families of type A reported that existing interactive projects are mostly single-person participation modes, lacking team projects suitable for sibling collaboration, leaving some children as mere spectators.

Intergenerational families of type B indicated that the pace of interactive projects is too fast, making it difficult for the elderly to keep up, and lacking interaction opportunities between children and grandparents. Single-parent families of type C hoped for more flexible and convenient service modes, such as short-term custody and emergency support, but such services are rarely provided. Dual-income nuclear families of type D expected more customized projects, such as themed research studies and private guided tours, but existing services are mostly generic, lacking personalization [17].

The service schedule also lacks flexibility, with the opening hours of most child-friendly facilities in attractions (such as nursing rooms and temporary care points) consistent with the attraction's business hours, failing to consider the early departure and late return travel patterns of the four types of families, leaving some families unable to access necessary services due to facility closures.

3.4. Lack of management coordination: Facility efficiency not fully unleashed

The construction and management of child-friendly facilities involve multiple departments, including culture and tourism, urban management, transportation, and construction. Currently, Chongqing lacks an effective cross-departmental coordination mechanism, resulting in scattered facility layouts, inconsistent standards, and disconnected information, limiting overall efficiency [18].

In the planning phase, the culture and tourism department is responsible for the tourism function design of attractions, while the construction department is responsible for infrastructure construction. The lack of effective communication between the two leads to a disconnect between facility construction and the needs of the four types of families. For example, some attraction infrastructure construction fails to consider the needs of multi-child and intergenerational families, lacking composite rest spaces and multi-child activity areas. The children's activity areas planned by the culture and tourism department are difficult to adapt to the mountain city terrain due to the lack of technical support from the construction department [19].

In the operation phase, relevant entities such as attractions, transportation, and accommodation lack coordinated linkage. The barrier-free facilities within attractions are disconnected from external transportation access points, requiring the four types of families to transfer multiple times from parking lots to attraction entrances. Accommodation facilities and attraction child-friendly facilities do not share information, making it difficult for families to obtain complete facility information in advance, affecting travel decisions [20].

In the management phase, there is a lack of unified facility standards and supervision mechanisms. The construction standards and service norms for child-friendly facilities vary significantly among different attractions, with some attractions constructing facilities perfunctorily, failing to meet safety standards. Industry authorities lack regular supervision and inspection, making it difficult to promptly rectify issues such as facility damage and service deficiencies, which seriously affect the facility usage experience of the four types of families.

4. Collaborative optimization paths for child-friendly facilities in Chongqing's parent-child tourism

4.1. Implementing precision facility layout guided by family typology

Abandon the "one-size-fits-all" supply model and conduct a precision facility layout based on the differentiated needs of the four types of families, combined with the topographical characteristics of the mountain city.

For multi-child families of type A, set up dedicated "all-age children's activity areas" within attractions, divided into anti-slip play areas for 0–3-year-olds, interactive areas for 3–6-year-olds, and science

popularization areas for 7–12-year-olds [21], equipped with play facilities and science popularization equipment suitable for different age groups [22]. Develop multi-child collaboration projects, such as Bayu culture-themed adventure games and natural exploration team tasks, to promote sibling interaction. Expand the space of family restrooms, set up multi-child handwashing stations and shared storage cabinets, and introduce "multi-child family discount packages," offering free or half-price access to some facilities for the second child, reducing travel costs for multi-child families [23].

For intergenerational families of type B, strengthen the configuration of safety protection and rest facilities: Install high-density guardrails (height ≥ 1.2 meters) in children's activity areas, water areas, steep slopes, and other dangerous areas, and set up conspicuous safety warning signs. Set up one "elderly and child-friendly composite rest area" every 300 meters on popular visiting routes, equipped with specialized seats for the elderly, child safety seats, health and wellness drinking water equipment, and emergency medicine kits. Issue "peace of mind wristbands" to children, embedded with positioning functions, to facilitate real-time tracking by grandparents. Optimize the design of attraction travel routes, reduce steep slopes and long-distance walking, and install assistance conveyor belts and gentle slopes at key sections to reduce physical exertion for the elderly and children. Provide child-friendly tableware and soft food adaptation services in dining areas to meet the dietary needs of the elderly and children.

For single-parent families of type C, improve safety guarantees and service support facilities: Set up temporary care points at core locations within attractions, providing professional caregivers and supporting short-term custody services [24]. Install safety monitoring throughout the attraction, add emergency call buttons and child safety fences, and arrange security personnel to patrol marginal areas regularly. Increase storage facilities and shared equipment rental points, providing rental services for strollers, child seats, camping equipment, etc., to reduce travel burdens for single-parent families. Regularly organize parent-child social activities, such as parent-child handicrafts and group games, to provide social opportunities for children and facilitate exchanges among parents, creating a mutual support atmosphere.

For dual-income nuclear families of type D, optimize the configuration of basic convenience facilities: Increase the density of nursing room layouts, setting up one nursing room every 500 meters in core visiting areas, equipped with bottle warmers, diaper changing tables, infant care beds, and hot water supply. Install vertical elevators and gentle slopes (slope ≤ 10°) [25] at key nodes within attractions (entrances, core visiting areas, exits) to ensure convenient passage for strollers. Set up parent-child shuttle buses between parking lots and core visiting areas to reduce climbing distances [26]. Introduce "efficient parent-child visiting routes," providing personalized guided tour services that can customize guided tour content and pace based on children's ages and interests. Develop research study projects integrated with Chongqing's local culture, such as Sichuan opera face painting and hotpot culture experiences, to enhance educational value and allow children to learn while playing.

4.2. Innovating characteristic child-friendly facilities adapted to mountainous terrain

Transform the challenges of mountain city terrain into unique experiences and create a child-friendly facility system that combines adaptability and uniqueness.

4.2.1. Optimizing the design of terrain-adaptive facilities

Install powered conveyor belts on long slope sections to facilitate the ascent of strollers and the elderly; add handrails and auxiliary ramps on both sides of stairs to enhance passage safety; utilize terrain elevation

differences to create tiered children's activity spaces, such as mountain slides and stepped gardens, which are both terrain-adaptive and fun.

4.2.2. Creating mountain city-specific experience facilities

Drawing inspiration from the design concepts of Chongqing's cable cars and the Crown Escalator, transform some passage facilities into sightseeing projects. For example, install mini sightseeing cable cars in scenic areas to not only solve terrain passage issues but also provide unique overhead views for families with children; develop facilities such as waterfront family trails and riverside children's parks, leveraging Chongqing's resources of "two rivers and four shores" to highlight the characteristics of a mountain-water city.

4.2.3. Strengthening terrain-adaptive maintenance of facilities

Regularly inspect the safety of ramps, stairs, and protective facilities, increasing maintenance frequency due to the wear-and-tear characteristics of mountainous terrain; promptly investigate potential hazards after extreme weather conditions such as heavy rain and high temperatures to ensure the stable operation of facilities under complex terrain conditions.

4.3. Developing layered parent-child tourism service products

Based on the differentiated needs of families, develop layered and personalized service products to address the issue of service homogenization.

4.3.1. Layered design of courses and activities

Similar to school curricula, design guidebooks, audio explanations, and research task cards with varying themes and depths for children of different age groups. For younger children, focus on fun and interactive activities (such as natural sound identification and plant touch interactions); for school-age children, emphasize in-depth science popularization through deep research activities (such as research on Chongqing's history and culture and exploration of geological landforms); design "tiered" activities for families with multiple children to ensure an appropriate experience for children of different ages.

4.3.2. Flexible and innovative service models

Introduce "time-segmented services," specifically setting "slow-paced sightseeing periods" for Type B families to avoid peak crowds and allow the elderly and children to stroll leisurely; provide "family-customized" services, offering personalized facility reservations, route planning, and activity arrangements based on the differing needs of the four types of families; develop "family collaboration task packages" to encourage family members to participate together and enhance interactive experiences [27]; set up "mobile service stations" to provide drinking water, emergency medications, facility consultations, and other services on a circuit basis within scenic areas to meet the immediate needs of the four types of families.

4.3.3. Incorporating local cultural elements

Integrate local elements such as Bayu culture, Three Gorges culture, and mountain city folklore into service content, and develop characteristic parent-child activities in Chongqing, such as Sichuan opera face painting, hot pot culture experiences, and model building of stilted houses; increase explanations of local culture in guide services to allow children to experience the charm of regional culture during their travels and achieve the dual

goals of education and cultural inheritance.

4.4. Establishing a collaborative management mechanism involving multiple entities

Break down departmental barriers and industry divisions to establish a collaborative management mechanism involving "government leadership, enterprise subject, and social participation" to enhance the overall effectiveness of facilities.

4.4.1. Establishing a cross-departmental collaboration platform

Led by the Chongqing Municipal Culture and Tourism Commission, collaborate with departments such as planning, construction, transportation, and urban management to establish a special working group for the construction of child-friendly facilities in parent-child tourism. Formulate the "Chongqing Construction Specifications for Child-Friendly Facilities in Parent-Child Tourism," clarifying facility construction standards, layout requirements, and service norms; establish a regular communication mechanism to coordinate the entire process of facility planning, construction, and operation, ensuring effective alignment between facilities and terrain, needs, and transportation.

4.4.2. Promoting industry entity collaboration and linkage

Facilitate information sharing and service linkage among relevant entities such as scenic areas, transportation, accommodation, and catering. Add a "child-friendly" section to smart tourism platforms like "One-Click Tour Chongqing," integrating and displaying information on child-friendly facilities, reservation services, and adaptation suggestions for scenic areas, hotels, and restaurants; promote cooperation between scenic areas and transportation departments to launch parent-child tourism special lines and optimize shuttle services between parking lots and scenic area entrances; encourage hotels and scenic areas to offer "parent-child packages" to achieve seamless connections between accommodation and sightseeing.

4.4.3. Strengthening supervision and feedback mechanisms

Establish a child-friendly facility evaluation system involving industry authorities, third-party institutions, and parent-child families. Regularly conduct facility satisfaction surveys and link evaluation results to scenic area ratings and policy support; open online and offline feedback channels to promptly collect improvement suggestions from the four types of families and practitioners, establishing a closed-loop mechanism of "feedback-processing-rectification-publicity" to continuously optimize facilities and service quality.

4.4.4. Increasing policy support

Include the construction of child-friendly facilities in the scope of special fund support for Chongqing's cultural and tourism industry development, providing financial subsidies to scenic areas for facility construction and upgrade projects that meet standards [28]; encourage cooperation between universities, research institutions, and enterprises to conduct research on the adaptability of child-friendly facilities and provide technical support for facility optimization; strengthen publicity for child-friendly facilities through channels such as social media and tourism brochures to create a "family-friendly" tourism atmosphere.

5. Conclusion and outlook

This study focuses on four types of families, revealing the differentiated patterns of demand for child-friendly facilities. It identifies four major issues in Chongqing's parent-child tourism child-friendly facilities, including mismatches between supply and demand and inadequate terrain adaptation. The study proposes optimization paths such as precise layout, characteristic facilities, tiered services, and collaborative management, enriching relevant research findings and providing practical references for similar cities.

Future research can further explore the following directions: First, expand the research scope to include parent-child destinations in Chongqing's districts and counties, comparing the demand differences and optimization paths for child-friendly facilities between urban and rural areas to support the development of comprehensive parent-child tourism across the region. Second, introduce quantitative research methods to construct a relational model between the demand for child-friendly facilities and tourism satisfaction, quantifying the impact weights of different facility dimensions, such as the extent to which safety and convenience facilities influence the experience, to make facility optimization more targeted. Third, focus on the application of smart technologies, exploring practical paths for artificial intelligence, big data, and other technologies in the planning, operation, and management of child-friendly facilities, such as using big data to analyze family travel hotspots for precise facility layout and employing intelligent monitoring to identify facility safety hazards in real-time, promoting the transformation of child-friendly facilities towards smartization.

Notes

(1) Type A multi-child families refer to parent-child families with ≥2 children; Type B intergenerational combined families refer to families where grandparents and grandchildren participate in tourism together; Type C single-parent families refer to parent-child families where a single parent travels with children; Type D dual-income nuclear families refer to parent-child families where both parents are employed and have only one child.

(2) Terrain adaptability refers to the degree of match between child-friendly facilities and Chongqing's mountainous terrain, including the alignment of facility layout with the terrain and the adaptability of facility use to the terrain.

Funding

The Master's Graduate Innovation Program of Chongqing University of Science and Technology, "Research on Development Strategies for Parent-Child Tourism in China Driven by Dual Factors of Demographic Structural Changes and Evolving Consumption Concepts" (Project Approval Number: YKJCX2521030)

Disclosure statement

The author declares no conflict of interest.

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