

A study on tourist satisfaction in the Xinbeitou Hot Spring Area, Taiwan

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Abstract

This study investigates tourist satisfaction in the Xinbeitou Hot Spring Area of northern Taiwan using a questionnaire survey with 406 valid responses. Findings indicate that young, well-educated visitors primarily seek relaxation and social bonding. High satisfaction was reported for environmental ambiance and hot spring quality, while lower ratings were given to souvenirs, pricing transparency, and activity diversity. Significant differences in satisfaction were found across age, education, occupation, and residence, but not income. The results highlight Xinbeitou's strengths in wellness tourism and suggest enhancements in cultural programming, retail quality, and service design to improve visitor experiences and destination competitiveness.

Keywords: Tourist satisfaction, Hot spring tourism, Xinbeitou, Visitor experience, Recreational activities, Wellness destination

1. Introduction

The Tatun Volcano Group (TVG) covers approximately 300 km² in the northernmost region of Taiwan, located just 10 kilometers north of the capital city, Taipei. Magmatic activity within the TVG is believed to have occurred under an extensional stress regime associated with post-collisional tectonics between the Philippine Sea Plate and the East Asian continental margin. This volcanism is contemporaneous with the opening of the southwestern section of the Okinawa Trough, as noted by Wang et al. (1999), Chang et al. (2003), Shyu et al. (2005), and Chen et al. (2010). Recent studies suggest the potential for ongoing volcanic activity in the area. Significant hydrothermal processes continue to discharge large amounts of thermal energy (Chen, 1970). Additionally, the presence of highly acidic hot springs, with pH values ranging from approximately 1 to 3, has been documented (Liu et al., 2011; Ohsawa et al., 2013). Hot springs are formed when groundwater is geothermally heated and rises to the Earth's surface. Beitou, located at the foothills of the dormant Yangmingshan volcanic range (also known as Mt. Yangming), lies atop the Datun volcanic system. This region hosts the highest concentration of hot springs in Taiwan, making it a prominent geothermal tourism destination.

Beitou, the northernmost district of Taipei City, began its development as a hot spring destination in 1896 with the establishment of Taiwan's first hot spring hotel, Tenguen, founded by Japanese entrepreneur Hirada Gengo.

The area's hot springs are primarily sourced from Thermal Valley and Longfeng (also spelled Longfong) Valley near Xingyi Road. Visitors can enjoy three distinct types of hot springs in Beitou: green sulfur, white sulfur, and iron sulfur. In 1999, Taiwan's Tourism Bureau under the Ministry of Transportation designated the year as the "Taiwan Hot Spring Tourism Year," and subsequently enacted the Hot Spring Act on June 3, 2003. These initiatives supported hot spring operators in obtaining water quality certifications, encouraged sustainable management practices, and promoted the overall development of hot spring tourism. With more than a century of development, the hot springs of Xinbeitou attract over one million visitors annually, earning it a place among Taiwan's top four hot spring destinations. The unique appeal of Xinbeitou lies in its blend of geothermal resources, historic streetscapes, cultural heritage, and local culinary delights. In recent years, the addition of high-end hotels has revitalized this historic mountain retreat, which remains easily accessible from downtown Taipei.

2. Literature Review (Section Heading)

Wang (2013) identified the Beitou Library as the most attractive recreational resource in the Xinbeitou Hot Spring Area, followed by the Hot Spring Museum and the Beitou Museum of Cultural Relics. In terms of overall tourism appeal, visitors most strongly agreed that Xinbeitou is characterized by its beautiful natural scenery, distinctive historical sites, and unique ecological features. Chang (2019) conducted a study focusing on Southeast Asian tourists visiting the Xinbeitou Hot Spring Area and found that most arrived via the Mass Rapid Transit (MRT) system. The primary motivation for their visit was to experience the hot springs, with hot spring bathing being the most commonly reported activity, followed by visits to Thermal Valley. Among the dimensions of tourism attractiveness, hot spring service facilities and natural and cultural resources received the highest satisfaction ratings. The dimension most strongly associated with visitors' perceived well-being was the emotional response of feeling "happy and relaxed." Revisit intention was most prominently expressed through agreement with the statement, "I would recommend the Xinbeitou Hot Spring Area to my friends and family," indicating a strong potential for positive word-of-mouth and destination loyalty. Despite the growing popularity of Xinbeitou as a tourism destination, research on the satisfaction levels of Taiwanese domestic tourists remains limited. Therefore, the purpose of this study is to examine visitor satisfaction in the Xinbeitou Hot Spring Area. The findings of this research are intended to provide practical insights and references for policymakers and industry stakeholders in the future planning and sustainable management of the area.

3. Methodology

We conducted a survey of tourists at the Xinbeitou hot spring area, a significant hot spring destination in northern Taiwan. The survey was systematically conducted on weekends in December 2024, targeting visitors at the study site. Weekends were selected due to the peak influx of visitors during this time. We employed purposive sampling to gather a sample of 450 tourists, resulting in 406 completed questionnaires. With a response rate of 90%, deemed acceptable for social science research, our data collection process was effective.

Prior to the formal survey, a pilot test was conducted to assess the reliability of the questionnaire. Data from a total of 406 valid responses were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including means and standard deviations, were used to evaluate tourists' travel characteristics and overall satisfaction. Independent samples t-tests were employed to examine whether significant differences in satisfaction levels existed based on tourists' gender and marital status. Additionally, one-way analysis of variance (ANOVA) with Scheffé's post hoc comparisons was conducted to explore differences in satisfaction across demographic variables such as age, educational level, and travel purpose.

4. Results and Discussions

Of the 450 questionnaires collected from visitors to the Xinbeitou Hot Spring Area, 406 were deemed valid and suitable for analysis. Table 1 presents the respondents' socio-demographic characteristics, including gender, marital status, age, education level, occupation, place of residence, monthly income, and disposable income. Among the respondents, 44.3% were male and 55.7% were female. The majority of visitors (60.6%) were between the ages of 16 and 25, indicating a predominantly young demographic. A high level of educational attainment was observed, with 80.3% holding at least a university degree. Students represented the largest occupational group, accounting for 52.0% of the sample. In terms of income, 64.5% reported a monthly income of less than NT\$30,000, while 39.5% indicated a monthly disposable income exceeding NT\$5,001. Notably, 90.9% of the respondents were residents of northern Taiwan, underscoring the area's appeal as a regional tourism destination.

Table 1. Profile of respondents

Tourist demographics	Percentage (%)	Tourist demographics	Percentage (%)
Gender		Occupation	
Male	44.3%	Student	52.0%
Female	55.7%	Service industry	18.5%
Marital status		Military, public and educational personnel	8.4%
Unmarried	77.8%	Industry	3.9%
Married	22.2%	Agriculture, Forestry, Fishing, and Animal Husbandry	0.0%
Age		Business	4.2%
16-25	60.6%	Housekeeping	2.5%
26-35	19.2%	Self-Employment	5.2%
36-45	8.9%	Retired	1.2%
46-55	6.9%	Others	4.2%
56-65	3.9%	Monthly income	
Above 66	0.5%	Below NT\$30,000	64.5%
Education level		NT\$30001~40000	16.7%
Below Junior high school	1.0%	NT\$40001~50000	7.6%
Junior high school	1.5%	NT\$50001~60000	2.2%
Senior high school	13.5%	Above NT\$60001	8.9%
Specialized school	3.7%	Monthly disposable income	
College	70.4%	Below NT\$1000	10.3%
Master or doctorate degree	9.9%	NT\$1001~3000	19.7%
Place of residence		NT\$3001~4000	12.8%

Northern Taiwan	90.9%	NT\$4001~5000	14.8%
Central Taiwan	4.7%	Above NT\$5001	42.4%
Southern Taiwan	1.7%		
Eastern Taiwan	1.2%		
Taiwan outlying islands	0.7%		
Others	0.7%		

Table 2 presents data on tourists’ travel characteristics, including information sources, purposes of visit, travel companions, modes of transportation, visit frequency, and expected duration of stay. The findings reveal that the most common source of information among respondents was word-of-mouth recommendations from friends and family (40.4%), followed by online sources (26.6%). This suggests that despite the widespread availability of digital travel information, personal recommendations continue to exert a strong influence on travel decisions. Among the 406 valid responses collected, the majority of visitors (53.7%) indicated that their primary purpose for visiting the Xinbeitou Hot Spring Area was to relax and relieve stress. This was followed by 30.3% of respondents who aimed to strengthen emotional connections with family and friends. Regarding travel companions, 38.7% visited with colleagues or friends, 30.3% with family members, and 17.0% as couples. These results suggest that the Xinbeitou Hot Spring Area is perceived as an ideal destination for relaxation and fostering social or familial bonds. In terms of transportation, the most commonly used mode was the Mass Rapid Transit (MRT) system, accounting for 35.2% of visitors, followed by private cars (29.1%) and motorcycles (24.9%). This pattern likely reflects the area’s accessibility and proximity to central Taipei. With regard to visit frequency, 38.7% of respondents were first-time visitors, while 27.8% were on their second visit, and 15.3% reported having visited five times or more. Although first-time visitors made up the largest group, the relatively high rate of repeat visitation suggests strong visitor appreciation and satisfaction with the destination.

Table 2. Profile of tourist travel characteristics

Tourist travel characteristics	Percentage (%)	Tourist travel characteristics	Percentage (%)
Information sources		Modes of transportation	
Friends and family	40.4%	Riding a motorcycle	24.9%
Travel brochure	10.1%	Taking a car	29.1%
Online information	26.6%	Taking a tour bus	6.4%
Newspapers and magazines	6.2%	Taking a taxi	0.5%
Television broadcast	4.7%	Taking the subway	35.2%
Travel agency	2.7%	Taking a public bus	2.7%
Passing by incidentally	4.2%	Others	1.2%
During class	2.5%	Frequency of visits	

Others	2.7%	Once	38.7%
Purposes of visit		Twice	27.8%
Relax and relieve stress	53.7%	Three times	12.6%
Promote emotional bonds among family and friends	30.3%	Four times	5.7%
Learn more knowledge	2.2	Five times or more	15.3%
Satisfy curiosity	10.8%	Expected duration of stay	
Others	3.0%	1-2 hours	8.4%
Travel companions		2-4 hours	40.9%
Traveling alone	9.1%	Half-day (4-8 hours)	41.4%
Family travel	30.3%	One day (8 hours or more)	9.4%
Traveling with colleagues or friends	38.7%		
Off-campus visit	1.2%		
Group travel	2.2%		
Couples' travel	17.0%		
Others	1.5%		

An analysis of the 25 items measuring recreational satisfaction revealed that visitor responses predominantly fell within the "satisfied" category (Table 3), indicating an overall favorable evaluation of the recreational experience in the Xinbeitou Hot Spring Area. The mean scores across all items ranged from 3.12 to 3.60, reflecting a moderately high level of satisfaction among the surveyed population.

The five highest-rated aspects were: (1) the overall environmental ambiance (M = 3.96), (2) the bathing environment (M = 3.84), (3) the quality of hot spring resources (M = 3.83), (4) the scenery (M = 3.81), and (5) the natural environment (M = 3.80). These findings emphasize the significance of natural and environmental elements in shaping a positive visitor experience, consistent with prior studies highlighting the role of nature-based features in wellness tourism destinations.

In contrast, the five lowest-rated aspects included: (1) to offer opportunities to engage in a variety of supplementary recreational activities (M = 3.57), (2) this activity enhanced my understanding of the historical evolution (M = 3.46), (3) store products are reasonably priced, with clear and transparent price labeling (M = 3.41), (4) hot spring-related activities (M = 3.37), and (5) souvenirs (M = 3.12). These results suggest that while the core thermal and environmental elements of the destination are highly satisfactory, supplementary features such as cultural interpretation, activity diversity, and retail experience are comparatively underdeveloped.

Overall, the findings reinforce Xinbeitou's strong positioning as a wellness and nature-based destination, driven by its natural assets and soothing ambiance. However, to enhance overall destination competitiveness and visitor satisfaction, efforts should be directed toward diversifying recreational offerings, strengthening cultural and interpretive content, improving pricing transparency, and upgrading the quality of souvenir products. Such enhancements can contribute to a more comprehensive and engaging visitor experience that aligns with evolving tourist expectations in the wellness tourism sector.

T-test analysis revealed statistically significant differences between male and female visitors in their perceptions of certain aspects of the Xinbeitou Hot Spring Area. Female respondents reported higher satisfaction than their male counterparts with both the natural environment ($M_{\text{male}} = 3.70$; $M_{\text{female}} = 3.89$) and the photo- and video-friendly environment that enables tourists to capture memorable moments ($M_{\text{male}} = 3.59$; $M_{\text{female}} = 3.78$). These gender-based differences may reflect differing preferences and behavioral tendencies, with female visitors typically placing greater emphasis on aesthetic and emotionally resonant elements of the environment—such as scenic beauty and opportunities for photography.

In contrast, no statistically significant differences were observed in visitor satisfaction with tourism resources and service facilities based on marital status. This suggests that satisfaction with core tourism offerings—such as infrastructure, amenities, and general service quality—is broadly consistent across individuals regardless of relationship status. The findings underscore the value of incorporating gender-sensitive design and marketing strategies in tourism development, while also highlighting the universal appeal of foundational tourism resources.

Table 3. The results of tourist recreational experience satisfaction

Tourism resources and service facilities	Mean	SD
The cultural heritage	3.60	0.74
The scenery	3.81	0.71
The natural environment	3.80	0.69
The photo- and video-friendly environment for tourists to capture memorable moments.	3.79	0.76
To offer a tranquil retreat from the hustle and bustle of urban life.	3.68	0.89
The experience contributes positively to my life satisfaction and personal happiness.	3.79	0.76
The overall environmental ambiance	3.96	0.71
The quality of hot spring resources	3.83	0.80
The bathing environment	3.84	0.76
The facilitates social interaction and enhances interpersonal relationships	3.73	0.76
To offer opportunities to engage in a variety of supplementary recreational activities.	3.57	0.78
Souvenirs	3.12	0.78
Hot spring-related activities	3.37	0.79
Environmental design and spatial arrangement	3.61	0.76
The hot spring culture	3.65	0.78

To provide educational information related to hot spring bathing	3.62	0.80
This activity enhanced my understanding of the historical evolution	3.46	0.90
The various visitor services and facilities provided by the Hot Spring Museum	3.63	0.77
To provide a calming environment conducive to reflection and mental relaxation	3.72	0.86
The spatial facilities are well-developed spatial infrastructure, including pedestrian-friendly zones and accessible facilities for individuals with disabilities	3.65	0.78
Store products are reasonably priced, with clear and transparent price labeling	3.41	0.79
Service staff possess sufficient professional knowledge to effectively address customer inquiries and resolve issues	3.62	0.74
The tourism environment is safe and secure for visitors	3.84	0.80
The region features a unique and well-preserved natural ecosystem	3.70	0.79
Tourist site signage is clear and well-marked	3.74	0.76

A one-way analysis of variance (ANOVA) was performed to examine the relationship between visitor satisfaction with tourism resources and service facilities and the demographic variables of age, educational level, place of residence, occupation, and monthly income. ANOVA testing revealed statistically significant differences in visitor satisfaction across age groups for two items: “opportunities to participate in a variety of supplementary recreational activities” and “the range of visitor services and facilities provided by the Hot Spring Museum” (Table 4). No significant differences were identified for the remaining survey items. These differences may be attributed to age-related variations in recreational preferences and service expectations. Younger visitors may prefer more diverse, interactive, and dynamic activity options, while older visitors may place greater emphasis on accessibility, comfort, and the quality of interpretive services offered by institutions such as the Hot Spring Museum. In contrast, the absence of significant differences for other aspects of the experience—such as environmental conditions and basic service infrastructure—suggests a shared and consistent perception of the core elements of the destination across all age groups. These findings highlight the importance of tailoring certain recreational and interpretive offerings to the preferences of different demographic segments while maintaining high standards in universally valued aspects of the visitor experience.

Table 4. Analysis of Visitor Satisfaction with Tourism Resources and Service Facilities by age group, with Scheffé Post Hoc Comparisons

Age	Tourism resources and service facilities	F ratio	P ratio	Scheffé post hoc comparison
1. 16-25 years old	The cultural heritage	0.63	0.68	

2. 26-35 years old 3. 36-45 years old 4. 46-55 years old 5. 56-65 years old 6. 66 years old and older	The scenery	0.66	0.66	
	The natural environment	0.40	0.85	
	The photo- and video-friendly environment for tourists to capture memorable moments	0.53	0.75	
	To offer a tranquil retreat from the hustle and bustle of urban life	0.70	0.63	
	The experience contributes positively to my life satisfaction and personal happiness	0.64	0.67	
	The overall environmental ambiance	0.78	0.56	
	The quality of hot spring resources	1.93	0.09	
	The bathing environment	2.02	0.08	
	The facilitates social interaction and enhances interpersonal relationships	1.26	0.28	
	To offer opportunities to engage in a variety of supplementary recreational activities	2.57*	0.03	1 □ 5,6
	Souvenirs	1.53	0.18	
	Hot spring-related activities	1.52	0.18	
	Environmental design and spatial arrangement	0.68	0.64	
	The hot spring culture	1.15	0.33	
	To provide educational information related to hot spring bathing	1.88	0.10	
	This activity enhanced my understanding of the historical evolution	1.15	0.33	
	The various visitor services and facilities provided by the Hot Spring Museum	3.00*	0.01	5,6 □ 1
	To provide a calming environment conducive to reflection and mental relaxation	0.63	0.67	
	The spatial facilities are well-developed spatial	0.37	0.87	

infrastructure, including pedestrian-friendly zones and accessible facilities for individuals with disabilities			
Store products are reasonably priced, with clear and transparent price labeling	1.67	0.14	
Service staff possess sufficient professional knowledge to effectively address customer inquiries and resolve issues	1.46	0.20	
The tourism environment is safe and secure for visitors	0.60	0.70	
The region features a unique and well-preserved natural ecosystem	1.88	0.10	
Tourist site signage is clear and well-marked	1.59	0.16	

*P < 0.05

Statistically significant differences in satisfaction were observed across visitors with different educational backgrounds regarding several aspects of tourism resources and service facilities (Table 5). These included: cultural heritage, souvenirs, environmental design and spatial arrangement, the provision of a calming environment conducive to reflection and mental relaxation, well-developed spatial infrastructure including pedestrian-friendly zones and accessible facilities for individuals with disabilities, and the presence of a unique and well-preserved natural ecosystem.

Scheffé’s post hoc comparisons revealed that visitors with a junior high school education reported significantly higher satisfaction with souvenirs compared to those with less than a junior high school education, as well as those with university or graduate-level education. Conversely, visitors with graduate-level education or higher expressed significantly lower satisfaction with the environmental design than those with junior high school, senior high/vocational school, and university-level education. Furthermore, respondents with less than a junior high school education reported significantly lower satisfaction with the range of services and facilities provided by the Hot Spring Museum compared to those holding university degrees or above. These educational differences in satisfaction may stem from varying expectations, levels of exposure, and evaluative criteria. Visitors with higher education levels may have greater aesthetic awareness or more extensive prior experience with comparable attractions, leading to more discerning or critical assessments—particularly in areas such as spatial design and interpretive infrastructure. In contrast, visitors with lower educational attainment may have fewer reference points or limited familiarity with service benchmarks, which could shape more favorable or less nuanced perceptions, especially in relation to complex facilities such as museums.

Table 5. Analysis of Visitor Satisfaction with Tourism Resources and Service Facilities by educational level, with Scheffé Post Hoc Comparisons

Educational level	Tourism resources and service facilities	F ratio	P ratio	Scheffé post hoc comparison
1. Below Junior high school 2. Junior high school 3. Senior high school 4. Specialized school 5. College 6. Master or doctorate degree	The cultural heritage	2.54*	0.03	
	The scenery	1.26	0.28	
	The natural environment	1.65	0.15	
	The photo- and video-friendly environment for tourists to capture memorable moments	1.90	0.09	
	To offer a tranquil retreat from the hustle and bustle of urban life	0.42	0.86	
	The experience contributes positively to my life satisfaction and personal happiness	1.13	0.34	
	The overall environmental ambiance	1.88	0.10	
	The quality of hot spring resources	1.23	0.30	
	The bathing environment	2.06	0.07	
	The facilitates social interaction and enhances interpersonal relationships	1.99	0.08	
	To offer opportunities to engage in a variety of supplementary recreational activities	1.15	0.34	
	Souvenirs	5.07*	0.00	2 □ 1,5,6
	Hot spring-related activities	1.75	0.12	
	Environmental design and spatial arrangement	4.89*	0.00	6 □ 2,3,5
	The hot spring culture	0.62	0.68	
	To provide educational information related to hot spring bathing	1.34	0.25	
	This activity enhanced my understanding of the historical evolution	1.33	0.25	
	The various visitor services and facilities provided by the Hot Spring Museum	1.16	0.33	
	To provide a calming environment conducive to	2.50*	0.03	

	reflection and mental relaxation			
	The spatial facilities are well-developed spatial infrastructure, including pedestrian-friendly zones and accessible facilities for individuals with disabilities	2.74*	0.02	
	Store products are reasonably priced, with clear and transparent price labeling	1.95	0.09	
	Service staff possess sufficient professional knowledge to effectively address customer inquiries and resolve issues	1.84	0.10	
	The tourism environment is safe and secure for visitors	2.10	0.07	
	The region features a unique and well-preserved natural ecosystem	3.24*	0.01	2 □ 6
	Tourist site signage is clear and well-marked	1.66	0.14	

*P □ 0.05

Statistically significant differences in satisfaction were observed among tourists from different places of residence with respect to hot spring-related activities, the range of services and facilities provided by the Hot Spring Museum, and the clarity of signage for tourist attractions (Table 6). These variations in satisfaction may be attributed to differences in familiarity, expectations, and prior tourism experiences across regions. Visitors from nearby areas may hold more specific expectations shaped by previous visits or local knowledge, while those traveling from more distant regions are likely to depend more heavily on on-site information and signage for wayfinding and interpretation. Furthermore, regional cultural preferences and differing benchmarks for service quality may also contribute to the observed disparities in satisfaction levels.

Table 6. Analysis of Visitor Satisfaction with Tourism Resources and Service Facilities by place of residence, with Scheffé Post Hoc Comparisons

Place of residence	Tourism resources and service facilities	F ratio	P ratio	Scheffé post hoc comparison
1. Northern Taiwan	The cultural heritage	0.81	0.54	
	The scenery	1.28	0.27	
2. Central Taiwan	The natural environment	1.11	0.35	
3. Southern Taiwan	The photo- and video-friendly environment for	1.91	0.09	

4. Eastern Taiwan 5. Taiwan outlying islands 6. Others	tourists to capture memorable moments			
	To offer a tranquil retreat from the hustle and bustle of urban life	0.46	0.81	
	The experience contributes positively to my life satisfaction and personal happiness	0.84	0.52	
	The overall environmental ambiance	1.28	0.29	
	The quality of hot spring resources	0.83	0.53	
	The bathing environment	0.63	0.68	
	The facilitates social interaction and enhances interpersonal relationships	1.43	0.21	
	To offer opportunities to engage in a variety of supplementary recreational activities	1.05	0.39	
	Souvenirs	0.78	0.56	
	Hot spring-related activities	2.35*	0.04	
	Environmental design and spatial arrangement	1.13	0.34	
	The hot spring culture	1.37	0.24	
	To provide educational information related to hot spring bathing	1.78	0.12	
	This activity enhanced my understanding of the historical evolution	1.69	0.14	
	The various visitor services and facilities provided by the Hot Spring Museum	2.64*	0.02	
	To provide a calming environment conducive to reflection and mental relaxation	1.75	0.12	
	The spatial facilities are well-developed spatial infrastructure, including pedestrian-friendly zones and accessible facilities for	1.78	0.12	

	individuals with disabilities			
	Store products are reasonably priced, with clear and transparent price labeling	0.49	0.78	
	Service staff possess sufficient professional knowledge to effectively address customer inquiries and resolve issues	0.47	0.80	
	The tourism environment is safe and secure for visitors	0.39	0.85	
	The region features a unique and well-preserved natural ecosystem	1.07	0.38	
	Tourist site signage is clear and well-marked	2.39*	0.04	

*P < 0.05

Tourists with different occupations exhibited statistically significant differences in their actual experiences of cultural and historical sites, the natural environment, the hot spring bathing environment, opportunities to engage in alternative recreational activities, and the clarity of signage for tourist attractions (Table 7). These differences may stem from the varying leisure preferences, lifestyle patterns, and travel motivations associated with different occupational groups. For instance, individuals in physically demanding or routine-intensive jobs may place higher value on restorative environments such as hot springs or natural settings, while those in creative or academic professions might be more attentive to cultural heritage and interpretive signage. Occupational background can also influence familiarity with tourism infrastructure and expectations regarding service quality, thereby shaping the perceived quality of the experience.

Table 7. Analysis of Visitor Satisfaction with Tourism Resources and Service Facilities by occupation, with Scheffé Post Hoc Comparisons

Occupation	Tourism resources and service facilities	F ratio	P ratio	Scheffé post hoc comparison
1. Student	The cultural heritage	2.62*	0.01	
2. Service industry	The scenery	1.37	0.21	
3. Military, public and educational personnel	The natural environment	2.30*	0.02	
4. Industry	The photo- and video-friendly environment for tourists to capture memorable moments	0.89	0.52	
5. Agriculture, Forestry, Fishing,	To offer a tranquil retreat from the hustle and bustle of urban life	1.85	0.07	

and Animal Husbandry 6. Business 7. Housekeeping 8. Self-Employment 9. Retired 10. Others	The experience contributes positively to my life satisfaction and personal happiness	0.79	0.61	
	The overall environmental ambiance	1.08	0.38	
	The quality of hot spring resources	1.87	0.06	
	The bathing environment	2.71*	0.01	
	The facilitates social interaction and enhances interpersonal relationships	2.31	0.02	
	To offer opportunities to engage in a variety of supplementary recreational activities	2.69*	0.01	
	Souvenirs	0.08	0.69	
	Hot spring-related activities	1.02	0.42	
	Environmental design and spatial arrangement	0.93	0.49	
	The hot spring culture	1.06	0.39	
	To provide educational information related to hot spring bathing	1.19	0.30	
	This activity enhanced my understanding of the historical evolution	1.61	0.12	
	The various visitor services and facilities provided by the Hot Spring Museum	1.06	0.40	
	To provide a calming environment conducive to reflection and mental relaxation	0.83	0.58	
	The spatial facilities are well-developed spatial infrastructure, including pedestrian-friendly zones and accessible facilities for individuals with disabilities	1.49	0.16	
Store products are reasonably priced, with clear and transparent price labeling	1.39	0.20		

	Service staff possess sufficient professional knowledge to effectively address customer inquiries and resolve issues	0.98	0.45	
	The tourism environment is safe and secure for visitors	0.82	0.59	
	The region features a unique and well-preserved natural ecosystem	1.05	0.40	
	Tourist site signage is clear and well-marked	2.06*	0.04	

*P < 0.05

No statistically significant differences in satisfaction with tourism resources and service facilities were found among tourists with different monthly income levels (Table 8). This finding may indicate that satisfaction with tourism resources and service facilities is influenced more by the quality of the visitor experience than by income level. It suggests that the attractions and services offered appeal broadly across income groups, possibly due to their accessibility, universal appeal, or standardized service delivery. Moreover, tourists across different income brackets may share similar expectations when visiting the same destination, particularly if the site promotes inclusive experiences and offers equitable access to facilities.

Table 8. Analysis of Visitor Satisfaction with Tourism Resources and Service Facilities by monthly income, with Scheffé Post Hoc Comparisons

Monthly income	Tourism resources and service facilities	F ratio	P ratio	Scheffé post hoc comparison
1. Below NT\$30,000	The cultural heritage	1.86	0.12	
	The scenery	0.56	0.69	
2. NT\$30001~40000	The natural environment	0.80	0.53	
	The photo- and video-friendly environment for tourists to capture memorable moments	0.13	0.97	
3. NT\$40001~50000	To offer a tranquil retreat from the hustle and bustle of urban life	0.48	0.75	
	The experience contributes positively to my life satisfaction and personal happiness	0.25	0.91	
4. NT\$50001~60000	The overall environmental ambiance	0.32	0.87	
	The quality of hot spring resources	0.64	0.63	
5. Above NT\$60001	The bathing environment	0.28	0.90	

The facilitates social interaction and enhances interpersonal relationships	2.06	0.07	
To offer opportunities to engage in a variety of supplementary recreational activities	0.63	0.65	
Souvenirs	0.31	0.86	
Hot spring-related activities	0.68	0.60	
Environmental design and spatial arrangement	1.75	0.14	
The hot spring culture	0.81	0.52	
To provide educational information related to hot spring bathing	1.07	0.37	
This activity enhanced my understanding of the historical evolution	0.59	0.67	
The various visitor services and facilities provided by the Hot Spring Museum	0.36	0.84	
To provide a calming environment conducive to reflection and mental relaxation	1.39	0.24	
The spatial facilities are well-developed spatial infrastructure, including pedestrian-friendly zones and accessible facilities for individuals with disabilities	1.51	0.20	
Store products are reasonably priced, with clear and transparent price labeling	0.35	0.84	
Service staff possess sufficient professional knowledge to effectively address customer inquiries and resolve issues	0.45	0.77	
The tourism environment is safe and secure for visitors	0.58	0.68	

	The region features a unique and well-preserved natural ecosystem	0.91	0.46	
	Tourist site signage is clear and well-marked	0.77	0.55	

*P < 0.05

There were no statistically significant differences in satisfaction with tourism resources and service facilities among tourists with different levels of monthly disposable income (Table 9). This result suggests that satisfaction with tourism resources and service facilities is not strongly influenced by tourists’ levels of disposable income. One possible explanation is that the destination offers a consistent and accessible visitor experience regardless of spending capacity, minimizing disparities in perceived value. Additionally, the standardized pricing, inclusive design, and quality of public services may help ensure equitable satisfaction across income groups. It is also possible that visitors prioritize experiential quality over monetary expenditure when evaluating their overall satisfaction.

Table 9. Analysis of Visitor Satisfaction with Tourism Resources and Service Facilities by disposable income, with Scheffé Post Hoc Comparisons

Monthly disposable income	Tourism resources and service facilities	F ratio	P ratio	Scheffé post hoc comparison
1. Below NT\$1000	The cultural heritage	0.43	0.79	
	The scenery	0.57	0.69	
2. NT\$1001~3000	The natural environment	0.83	0.51	
	The photo- and video-friendly environment for tourists to capture memorable moments	1.45	0.22	
3. NT\$3001~4000	To offer a tranquil retreat from the hustle and bustle of urban life	0.16	0.96	
	The experience contributes positively to my life satisfaction and personal happiness	0.65	0.63	
4. NT\$4001~5000	The overall environmental ambiance	1.33	0.26	
	The quality of hot spring resources	0.68	0.61	
5. Above NT\$5001	The bathing environment	0.64	0.64	
	The facilitates social interaction and enhances interpersonal relationships	0.62	0.65	
	To offer opportunities to engage in a variety of	1.10	0.36	

supplementary recreational activities			
Souvenirs	1.21	0.31	
Hot spring-related activities	2.02	0.09	
Environmental design and spatial arrangement	0.77	0.55	
The hot spring culture	0.53	0.71	
To provide educational information related to hot spring bathing	0.77	0.55	
This activity enhanced my understanding of the historical evolution	1.14	0.34	
The various visitor services and facilities provided by the Hot Spring Museum	0.38	0.82	
To provide a calming environment conducive to reflection and mental relaxation	0.69	0.60	
The spatial facilities are well-developed spatial infrastructure, including pedestrian-friendly zones and accessible facilities for individuals with disabilities	0.48	0.75	
Store products are reasonably priced, with clear and transparent price labeling	2.16	0.07	
Service staff possess sufficient professional knowledge to effectively address customer inquiries and resolve issues	1.36	0.25	
The tourism environment is safe and secure for visitors	0.82	0.51	
The region features a unique and well-preserved natural ecosystem	0.26	0.91	
Tourist site signage is clear and well-marked	0.65	0.63	

*P < 0.05

4.1 Implementations

The findings of this study offer several practical implications for tourism stakeholders in the Xinbeitou Hot Spring Area. Destination managers should prioritize enhancing the variety and quality of supplementary recreational activities to meet the expectations of younger visitors and repeat tourists. Improvements in pricing transparency and the development of culturally distinctive, high-quality souvenirs could further enrich the visitor experience. Public and private sectors are encouraged to collaborate in strengthening interpretive services at key attractions such as the Hot Spring Museum. Additionally, tailored marketing strategies that consider the demographic preferences—particularly those related to age, education, and occupation—can help increase visitor satisfaction and loyalty. By addressing these aspects, tourism planners can better align service provision with evolving tourist needs, thereby promoting sustainable growth and destination competitiveness.

4.2 Limitations and Future Research Recommendations

Despite the valuable insights gained from this study, several limitations should be acknowledged. First, the use of purposive sampling and data collection limited to weekends may affect the generalizability of the findings, as weekday visitors or international tourists might exhibit different satisfaction patterns. Second, the study relied on self-reported data, which are subject to response bias and may not fully capture tourists' actual behaviors or perceptions. Third, the cross-sectional nature of the survey does not account for seasonal variations or changes in visitor satisfaction over time. Future research could adopt longitudinal designs, include broader sampling frames, and explore qualitative approaches to gain deeper insights into visitor motivations and experiences.

5. Conclusions

This study confirms that the Xinbeitou Hot Spring Area delivers a generally positive visitor experience, particularly in its natural ambiance, hot spring quality, and accessible urban location. Most tourists are young, educated individuals traveling for leisure and stress relief. Statistically significant differences in satisfaction were identified based on age, educational attainment, occupational background, and region of origin, reflecting diverse visitor expectations and preferences. In contrast, satisfaction levels did not vary significantly with income, suggesting the destination's inclusive appeal across economic groups. However, the relatively low satisfaction with certain aspects—such as the range of activities, pricing transparency, and souvenir offerings—highlights areas for improvement. To enhance destination competitiveness and repeat visitation, stakeholders are advised to diversify cultural and recreational programming, upgrade staff service capabilities, and ensure fair and visible pricing in retail settings. These findings provide actionable insights for tourism planners and policymakers seeking to optimize the management and sustainability of hot spring tourism in Taiwan.

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