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Tourist Engagement with Garden Visitation during Health Crises: A Statistical Analysis

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This study investigates tourist engagement with garden visitation during health crises, aiming to understand the evolving role of public green spaces in fostering well-being and mitigating disruption. Utilising a self-completion questionnaire, data was collected from 536 randomly selected respondents across seven public gardens in Irbid, Jordan, during the COVID-19 pandemic. Analysis included descriptive statistics, reliability and regression analysis, and various comparative tests. The typical visitor was identified as a young, highly educated woman, often married with children, who had visited the gardens previously. Key motives for visiting were identified as escape, stress reduction, enjoyment, safety, prior experience, and appreciation of natural beauty. Despite pandemic-induced visitation declines, the research reveals consistent high visitor satisfaction, with a significant majority expressing intentions to revisit and recommend the gardens. Regression analysis conclusively identifies facilities & infrastructure (as the predominant factor), the on-site environment (cleanliness, tranquillity, natural beauty), and visitors' escape/relaxation motive as key drivers of this satisfaction. However, critical deficiencies in essential services (e.g., restrooms, accessibility, first-aid, parking, and diversified marketing) were also identified, hindering optimal engagement. The study underscores the pivotal function of green spaces in public well-being during health crises and provides actionable recommendations for enhancing garden management and visitor experience. These insights are

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crucial for developing resilient urban planning and tourism strategies in response to future health crises.

Keywords: Tourist engagement, garden tourism, visitor motives, health crises, COVID-19 pandemic, Jordan.

1 Introduction

Garden visitation, with roots in the 19th century and growth in the mid-20th (Ottosson and Grahn, 2005; Benfield, 2018; De Oliveira Paiva et al., 2020; Pavia et al., 2020), has recently gained prominence as a significant tourism activity (Benfield, 2013, 2018, 2021). Gardens offer well-documented benefits including stress reduction, relaxation, and social, spiritual, recreational, and educational opportunities (Jordaan and Plessis, 2014; Wassenberg et al., 2015; De Oliveira Paiva et al., 2020). However, the onset of health crises, such as epidemics like SARS or MERS, and most recently exemplified by the widespread COVID-19 pandemic, has demonstrably impacted garden visitation. These crises often correlate with factors like heightened public health concerns, government-imposed restrictions, and lockdown measures (Benfield, 2021; Davies, 2022; Gordon-Rawlings and Russo, 2023). Garden tourism is a significant leisure segment attracting diverse visitors (Dann, 1981; Fox, 2007; Phau et al., 2013; Kimmm, 2017; Pavia et al., 2020; Benfield, 2021). Public gardens enhance quality of life and preserve cultural and leisure resources (Sinh, 2013; Nilson and Thorel, 2018). They offer scenic environments with diverse flora and fauna (Sinh, 2013; Pavia et al., 2020) and provide relaxation and entertainment, especially for families and children (Parsons, 2011; Pavia et al., 2020).

1.1 Aim and objectives

This research aims to understand visitor motivations, experiences, and satisfaction in Irbid's public gardens. Specifically, it seeks to:

1. Identify visitor motives,
2. Explain revisit intentions and recommendations,
3. Assess service satisfaction, and
4. Examine the impact of health crises on garden engagement, drawing insights from the COVID-19 pandemic.

1.2 The research problem

Garden visitation, with roots in the 19th century and growth in the mid-20th (Ottosson and Grahn, 2005; Benfield, 2018, 2021; De Oliveira Paiva et al., 2020) has recently gained prominence as a significant tourism activity (Benfield, 2013, 2018, 2021). Gardens offer well-documented benefits including stress reduction, relaxation, and social, spiritual, recreational, and educational opportunities (Jordaan and Plessis, 2014; Wassenberg et al., 2015; De Oliveira Paiva et al., 2020). However, health crises, as exemplified by the COVID-19 pandemic, have been shown to negatively impact garden visitation, correlating with factors such as daily cases and lockdown measures (Benfield, 2021; Davies, 2022;

Gordon-Rawlings and Russo, 2023) However, despite these known benefits and growing interest, a critical knowledge gap exists regarding garden visitation in Jordan and the wider Arab world, particularly concerning visitor motivations and behaviour, and most acutely, how these are affected by health crises. This gap is particularly pronounced in the context of how health crises affect such engagement. Therefore, this study addresses this critical void by investigating visitor motivations, experiences, future behaviour, and the impact of the COVID-19 pandemic on garden visitation in Irbid, providing insights relevant to managing green spaces during similar future challenges. The research questions are:

1. What motivates visitors to Irbid's public gardens?
2. What are visitors' revisit intentions and word-of-mouth recommendations?
3. How do visitors evaluate garden facilities and services?
4. How do health crises affect visitor engagement with gardens, as evidenced during the COVID-19 pandemic?

1.3 Research hypotheses

To address the research questions, four hypotheses were formulated. These hypotheses investigate visitors' motivations, service satisfaction, revisit and recommendation intentions, and the effects of health crises (e.g., the COVID-19 pandemic's restrictions) on outdoor behaviour.

H_1 : Visitors' main motivations to visit public gardens in Irbid are to escape, relaxation, and enjoyment.

H_2 : Visitors were satisfied with the services offered at Irbid gardens.

H_3 : Most visitors have the intention to revisit and to recommend the gardens.

H_4 : Health crises, including the COVID-19 pandemic, notably restrict most individuals' opportunities for outdoor engagement.

2 Theoretical background

A literature review of statistical evaluations of garden visitation during health crises, notably during the COVID-19 pandemic, reveals key findings. Studies from this pandemic era show varied trends: increased visitation in some countries, driven by acute needs for stress relief and outdoor engagement during a crisis, while others saw significant decreases due to severe restrictions (Benfield, 2021; Pavia et al., 2020). Despite these variations, consistent patterns emerged during this health crisis: weekend and summer visits remained high, and younger, educated individuals frequently sought gardens for relaxation, mood improvement, and nature connection. Popular activities observed during this period of crisis included walking and picnicking. Visitors are drawn to gardens for inherent benefits like stress reduction, aesthetic enjoyment, education, and social interaction, which become even more pronounced during health crises (Pavia et al., 2020; Benfield, 2021). Motivations are typically categorised as push factors (e.g., escape, social interaction, relaxation; Kamau et al. (2015); Pan and Ryan (2007)) and pull factors (e.g., perceived safety, available facilities, and environmental quality; Lehto et al. (2002);

Kim et al. (2003)). These culturally-influenced motivations can also shift in prominence during periods of widespread public health challenges (Welte, 2011). Health crises, such as the COVID-19 pandemic, have demonstrably impacted garden visitation. Closures and restrictions imposed during the pandemic significantly affected visitor numbers, though visitation often rebounded as measures eased. Research from this period indicates that individuals increasingly visited gardens to escape stress, connect with nature, and socialise. This shift occurred despite a pre-crisis trend of rising garden visitation, exemplified by a 20% increase in UK public garden visits from 2015-2019 (Benfield, 2021). Globally, garden visitation saw a sharp decline of 40% in 2020 during the height of the COVID-19 health crisis (Davies, 2022), with urban areas experiencing an even greater decrease, and organized activities also declining (Gordon-Rawlings and Russo, 2023). Factors influencing garden engagement during such crises consistently include government restrictions, heightened public health concerns, altered travel patterns, and a notable rise in nature-based and sustainable tourism (Benfield, 2021; Davies, 2022; Gordon-Rawlings and Russo, 2023).

2.1 Gardens as visitor attractions

Gardens, defined as public recreation areas with plants and trees (Merriam-Webster Dictionary Online, 2021), offer restorative experiences (Gordon-Rawlings and Russo, 2023) and serve as recreational, entertainment, and educational attractions. Attractions are categorised as natural, man-made, heritage, or event-based (Leiper, 1995; Page, 2009). This study adopts (Leiper, 1995) definition, viewing attractions as a system of tourist, nucleus (central element), and marker (informative element), which must function cohesively (Figure 1).

To attract visitors, gardens must incorporate key elements, primarily outdoor settings and scenery. (Page, 2009) categorizes these as primary (core attractions), secondary (garden characteristics, flora, product quality; Gunn (1988), and additional (access, parking, food, shops, weather). Yale (1997) and Swarbrooke and Page (2012) echo these elements, emphasizing accessibility, amenities, and effective management for attraction success. Essentially, Gunn (1988), Yale (1997), Swarbrooke (1995), and Page (2009) converge on the necessity of providing a range of attractions and services to enhance visitor experience.

2.2 Public gardens

Gardens historically served religious and spiritual purposes in different cultures including Egyptians, Assyrians, Greeks, Chinese (Kisling, 2001; Benfield, 2013). In the Islamic era, they provided urban green spaces (Baara, 2010; Goethe Institute, 2013). 16th-century European gardens focused on medicinal plants, later evolving into educational spaces Rakow (2011). The American Public Gardens Association (APGA) (2021) defines public gardens as institutions for public education, enjoyment, research, and conservation. Rakow (2011) offers a simpler definition, emphasising plant collections, infrastructure, and organisational management. This study adopts Rakow's definition, encompassing

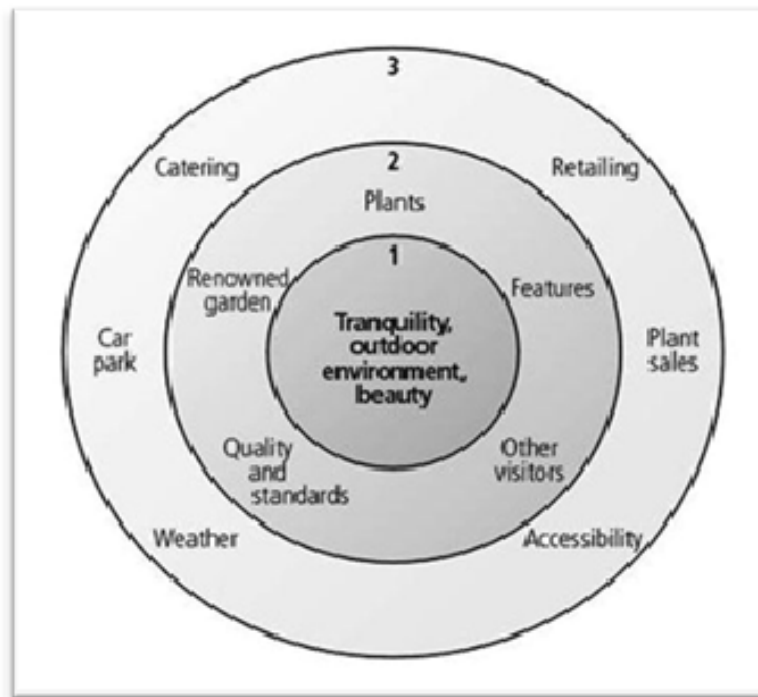


Figure 1: A garden as a visitor attraction product (Page 2009, p.358).

diverse garden types (botanical, historic, etc.) as identified by Rakow (2011) and Dehgan (2014).

2.3 Garden tourism

Garden tourism is defined variously: Benfield (2013, 2021) emphasizes travel for horticultural experiences; Benfield (2018) classifies it as cultural tourism; the European Union Cult Tour Project (2012) focuses on gardens/parks as destinations; Gruber (2011) links it to a destination's tourism service chain; and Hantz and Hlavac (2006) highlight gardens/parks as the aim, regardless of ownership. While these definitions agree on gardens as tourism destinations, they often overlook visitor motivations. This study proposes a more comprehensive definition: garden tourism involves travel to diverse garden types (botanic, historical, etc.) for social, educational, recreational, or spiritual purposes.

2.4 Motivations for garden tourism

Understanding motivation is crucial in tourism for destination promotion Mayo and Jarvis (1981). Defined as a force to reduce tension (Mayo and Jarvis, 1981), satisfy needs (Leiper, 2004), or drive action (Daft, 2021), motivation aims to address human imbalance. Mayo and Jarvis (1981) highlight cultural, personal, psychological, spiritual, and social influences on behaviour, aligning with Crompton (1979) Push and Pull Theory (escape, relaxation, scenery, activities, etc.). Garden visit motives vary across

Table 1: Motives to visit gardens

Category	Examples
1. Social	Meeting family, friends, or others.
2. Spiritual/emotional	Meditation, pleasure in viewing gardens, admiring beauty of nature, relax, tranquillity and relief of stress, break routine.
3. Recreational	Enjoy day, enjoy the garden, entertaining children.
4. Educational/intellectual	Learning, curiosity to gain knowledge, developing a hobby.

Source: Developed by the authors after Jordaan and Plessis (2014); Wassenberg et al. (2015).

cultures (Welte, 2011; Connell, 2002); Welte (2011). Research indicates that visitors are drawn to public gardens for social interaction (Welte, 2011; Connell, 2004), enjoyment and fun (Connell, 2004), learning (Connell, 2004), nature appreciation, and relaxation (Gallagher, 1983; Connell, 2002; Benfield, 2013, 2021). Table 1 summarizes these motive categories.

A review of 30 garden tourism articles (1983-2023) identified key visitor motives: social (family/friends), spiritual/emotional (nature appreciation), and recreational (fun). Educational motives were less prominent (Bitgood, 2002; Ballantyne et al., 2008). Analysing 30 garden tourism studies (1983-2023) from the UK, the USA, Austria, Cyprus, and Spain, the review revealed dominant visitor motives: social (Connell, 2002, 2004; Ballantyne et al., 2008; Welte, 2011; Benfield, 2013; Irvine et al., 2013), spiritual/emotional (Bennett and Swasey, 1996), and recreational (Jordaan and Plessis, 2014; Wassenberg et al., 2015). Educational motives were less influential (Bitgood, 2002; Ballantyne et al., 2008).

2.5 Public gardens in Irbid

To provide residents with tranquil and entertaining spaces, Irbid Municipality has developed 30 public gardens. Table 2 details the services and facilities offered.

All seven Irbid gardens offer basic services (guards, restrooms, play areas, etc.), but variations exist. Imaar and Ashrafieh lack libraries and water features, as does Prince Rashed. Only Tunis and King Abdullah II have theatres. King Abdullah II is unique in offering prayer rooms, food/beverage services, a bird park, and a plant nursery. Overall, food/beverage and green area offerings are limited.

2.6 Tourists' engagement with gardens during health crises: insights from the COVID-19 pandemic

Tourist engagement, crucial for positive experiences and destination promotion (Benfield, 2021; Gordon-Rawlings and Russo, 2023), is significantly impacted during health crises, as starkly evidenced by the COVID-19 pandemic. During this global health crisis,

Table 2: Facilities and services available at the gardens

#	Available services	A	B	C	D	E	F	G
1	Security (guards)	✓	✓	✓	✓	✓	✓	✓
2	Accessibility	✓	✓	✓	✓	✓	✓	✓
3	Car Park	✓	×	×	×	×	×	×
4	Toilets	✓	✓	✓	✓	✓	✓	✓
5	Library	✓	×	✓	×	✓	✓	×
6	Recreation facilities	✓	✓	✓	✓	✓	✓	✓
7	Children areas (e.g., slides, swings)	✓	✓	✓	✓	✓	✓	✓
8	Trails	✓	✓	✓	✓	✓	✓	✓
9	Facilities for the disabled visitors	✓	×	×	×	×	×	×
10	Rest facilities	✓	✓	✓	✓	✓	✓	✓
11	Cleanliness	✓	✓	✓	✓	✓	✓	✓
12	Lights	✓	✓	✓	✓	✓	✓	✓
13	Sign boards	✓	✓	✓	✓	✓	✓	✓
14	Water bodies	✓	×	×	×	×	×	×
15	Theatres	✓	×	×	×	×	✓	×
16	Trees and flowers	✓	✓	✓	✓	✓	✓	✓
17	Prayer rooms	✓	×	×	×	×	×	×
18	Food and beverage	✓	×	×	×	×	✓	×
19	Bird Park	✓	×	×	×	×	✓	×
20	Vegetation	✓	✓	✓	✓	✓	✓	✓

Source: Developed by the authors (2021).

Note: A = King Abdullah II Garden; B = Emaar Irbid Garden; C = Ashrafiya Garden; D = Tunis Garden; E = Istiklal Garden; F = Aidoun Garden; G = Prince Rashed Garden.

widespread garden closures and reduced visitation were observed (Benfield, 2021; White et al., 2021), reflecting global trends (World Health Organisation (WHO), 2021) and Jordan's own stringent restrictions Petra News Agency (2020). The COVID-19 pandemic, which resulted in over 220 million confirmed cases and over 4 million deaths globally by August 30, 2021 (World Health Organisation (WHO), 2021), and over 800 thousand confirmed cases and over 10 thousand deaths in Jordan alone during the same period, profoundly disrupted health, economy, and social interactions. Consequently, public gar-

dens experienced substantial event cancellations, including 91% of educational classes, 83% of external events, and 69% of ticketed events (Benfield, 2021). In Jordan, government lockdowns during 2020 and mid-2021 specifically affected public gathering places, including gardens, with Irbid Municipality notably closing its gardens and reopening them in June 2021. To counter such impacts during future health crises, destination managers should prioritize authentic experiences, interactive activities, and accessible information (Benfield, 2021), fostering deeper community engagement and encouraging sustained visitation.

3 Material and methods

Following the standard statistical analysis process (Field, 2018), this descriptive survey study explored changes in tourist engagement with garden visitation during a health crisis. Specifically, data was collected to understand visitor demographics, motivations, and satisfaction within Irbid's public gardens during the COVID-19 pandemic, utilising a questionnaire administered on-site. The selection of independent variables for the regression model, which aimed to identify key determinants of visitor satisfaction in public gardens during a health crisis, was systematically guided by existing literature and the study's objectives. Consistent with established research on green space visitation, perceived facilities and infrastructure and the overall on-site environment were included as crucial pull factors known to significantly influence visitor experience. Furthermore, visitor motivations, particularly the escape/relaxation motive, were incorporated as a key push factor, reflecting their documented importance in leisure behaviour and their likely amplification during stressful periods like the COVID-19 pandemic. Finally, relevant demographic variables were included to control for their documented influence on recreational patterns and preferences. This comprehensive approach ensures the model's theoretical grounding and its ability to robustly explain visitor satisfaction within the study's specific context.

3.1 Research design and sample

This study, a quantitative survey conducted in Irbid during July-August 2021, investigated public garden visitation among residents aged 18 and over. To ensure a representative sample, systematic random sampling, with birthday selection for group visitors, was used across seven strategically selected gardens, representing Irbid's neighbourhoods (Irbid Municipality, 2021). As visitor statistics were unavailable, a quota sampling method, proportional to garden size, was implemented. The largest garden, King Abdullah II (177,000 m²), accounted for 71.1% of the total garden area. Out of 1000 distributed questionnaires, 536 were returned (53.6% response rate).

To further enhance representativeness, systematic intercept sampling was employed across the seven gardens, capturing data at various times and days. Despite the 53.6% response rate, this sampling strategy minimized potential bias. The achieved sample size of 536 was considered adequate for statistical analyses, given the unknown population size. This aligns with the Krejcie and Morgan (1970) table, which recommends a

Table 3: Gardens in the sample ($n = 7$)

#	Garden name	Neighbourhood	Year founded	Area (m ²)	Share of size (%)
1	King Abdullah II	Southeast	2015	177000	71.1
2	Emaar Irbid	South	1989	25000	10.0
3	Ashrafiya	South	1986	16000	6.4
4	Tunis	Southwest	1986	12000	4.8
5	Istiklal	Northwest	2005	10000	4.0
6	Aidoun	West	2015	5000	2.0
7	Prince Rashed	East	1985	4000	1.6
			Total area	249000	100.0

Source: Municipality of Irbid, Department of Gardens (2021).

sample of 384 for populations exceeding 1,000,000, ensuring sufficient statistical power and minimizing the margin of error.

Irbid's public gardens, the study's sites, presented diverse characteristics that directly shaped the 536-responder sample. While most gardens were established between 1985-1989 and were smaller (4,000-25,000 m²), accounting for 29% of sampled visits, King Abdullah II Garden, established in 2015 and significantly larger (177,000 m²), dominated the sample (71% of visits). This variation in age and size suggests a diverse range of facilities, likely catering to varied visitor needs and contributing to the sample's breadth. Critically, the gardens' distribution across populated neighbourhoods meant the sample primarily captured local residents seeking accessible outdoor recreation, underscoring their role as vital local green infrastructure. This local focus was highly relevant given the amplified importance of accessible community spaces during health crises like the COVID-19 pandemic.

3.2 Measurement

A self-completion questionnaire, chosen for its efficiency and respondent flexibility (Jennings, 2011; Gayle, 2007; Gray, 2013; Veal, 2017), was used to collect data, with incomplete responses excluded to minimize non-response bias (Koch and Blohm, 2016; Zahl-Thanem et al., 2021). The questionnaire comprised five sections: demographics, visitation behaviour, visit motivations, satisfaction/future behaviour (revisit, WOM), and a 20-item Likert scale (1-5) evaluation of garden facilities. From 1000 distributed questionnaires across seven Irbid gardens, 536 were returned (53.6% response). Data was analysed using SPSS 22.0, employing descriptive statistics, reliability and factor analysis, t-tests, ANOVA, and non-parametric tests to address the research hypotheses.

Table 4: Distribution of the sample to gardens ($n = 536$)

#	Garden name	Questionnaires distributed	%	Questionnaires returned	%
1	King Abdullah II	711	71.1	334	62.4
2	Emaar Irbid	100	10.0	56	10.4
3	Ashrafiya	65	6.43	45	8.3
4	Tunis	48	4.8	39	7.3
5	Istiklal	40	4.0	33	6.2
6	Aidoun	20	2.0	16	3.0
7	Prince Rashed	16	1.6	13	2.4
Total		1000	100.0	536	100.0

Source: Developed by the authors.

4 Results

4.1 Distribution of the sample

Data were collected on visitor engagement from Irbid's public gardens, aiming for a representative sample from its 481,000 population (Department of Statistics (DOS), 2021). Of 1000 targeted visitors, 536 questionnaires were successfully returned (53.6% response rate), providing a robust sample. Data collection took place in seven distinct gardens during July-August 2021, a period significantly impacted by the COVID-19 pandemic. King Abdullah II Garden notably accounted for 62.4% of respondents, reflecting its prominence. To ensure representativeness and minimize bias, we used a quota sampling approach proportional to garden size, followed by systematic random sampling (every fifth visitor aged 15+ years). For groups, the birthday selection method randomly identified respondents. This rigorous methodology offers a strong foundation for understanding visitor behaviour and perceptions during this critical health crisis.

4.2 Reliability and validity of the research

Instrument reliability (Cronbach's $\alpha = 0.868$) and validity were robustly established. Reliability was assessed using SPSS. Validity was confirmed through expert review (face and construct validity), convergent validity assessment, and Exploratory Factor Analysis (EFA) utilizing Principal Component Analysis (PCA) with Varimax rotation, which collectively explained 66.714% of the variance. These comprehensive measures, consistent with established methodologies (Jennings, 2011; Field, 2018), firmly support the generalizability and trustworthiness of the study's findings.

4.3 Descriptive statistics

4.3.1 Visitors' profile

To accurately contextualise and interpret the potentially diverse visitor perceptions of Irbid's gardens, Table 5 presents the demographic profiles of respondents. Understanding these demographic variables is crucial as they often correlate with varied needs, preferences, and expectations regarding public green spaces, which can be particularly pronounced during health crises.

Table 5: Visitors' profile ($n = 536$)

Category		Frequency	%
Gender	Male	127	23.7
	Female	409	76.3
Marital Status	Single	216	40.3
	Married	320	59.7
Have children?	Yes	319	59.5
	No	217	40.5
Age	18–29	120	22.4
	30–39	187	34.9
	40–49	151	28.2
	50–59	60	11.2
	60+	18	3.4
Education	Primary	70	13.1
	Secondary/high school	119	22.2
	College/university degree	347	64.7
Profession	Unemployed	154	28.7
	Self-employed	70	13.1
	Retired	54	10.1
	Public/private employee	176	32.8
	Student	25	4.7
	Skilled/unskilled worker	57	10.6
Nationality	Jordanians	385	71.8
	Arabs	107	20.0
	Europeans	44	8.2

Source: Developed by the authors.

The study involved a substantial sample of 536 Irbid garden visitors, providing a robust foundation for understanding engagement patterns during the COVID-19 pandemic.

The demographic profile revealed a clear predominance of female visitors (76.3%) and a majority of married individuals (59.7%). This female majority aligns with broader trends in leisure and green space visitation studies, suggesting that women may disproportionately seek such spaces for recreation or social interaction, a need potentially amplified during periods of household stress or restricted outside activities typical of a health crisis. Furthermore, the sample was notably youthful, with 85.5% of visitors under 50 years old, indicating that younger to middle-aged adults constitute the primary user base for these urban green assets. This demographic group, often balancing work and family responsibilities, might particularly value accessible local outdoor spaces for stress relief and physical activity during widespread disruptions. A significant proportion of respondents were also highly educated (64.7%) and employed (56.5%), aligning with national statistics for Jordan's urban centres (Department of Statistics, DOS, Jordan, 2021). The high education level could correlate with a greater awareness of health and well-being benefits associated with nature exposure, potentially driving their engagement with gardens as essential outlets during the COVID-19 pandemic. The strong representation of Jordanian nationals (71.8%) further confirms the study's focus on understanding local community engagement with these public amenities during the challenging period of the pandemic.

4.3.2 Visitor experience

Exploring the multifaceted visitor experience at Irbid's public gardens, Table 6 details the results of key behavioural patterns, motivations for visitation, and overall satisfaction. Understanding these aspects is crucial for comprehending how individuals engaged with green spaces, particularly amidst the challenges posed by the COVID-19 pandemic.

Analysis of visitor behaviour (Table 6) offers crucial insights into engagement patterns within Irbid's public gardens, particularly during a health crisis. The data reveals a notably high rate of repeat visitation (87.9%), with a significant proportion (48.3%) making frequent trips (1-10 times) and two-thirds visiting monthly. This consistent engagement underscores the gardens' role as vital, accessible recreational outlets for the local community, a function amplified during COVID-19 pandemic-related restrictions and stress. Furthermore, the average duration of stay of 3-5 hours for 70% of visitors indicates these gardens are destinations for extended leisure. The strong preference for family visits (68.5%) highlights their importance as communal spaces supporting household well-being. These patterns compel garden managers to prioritize initiatives fostering loyalty and catering to family-oriented, extended visits, ensuring these green spaces remain resilient community assets during and after public health emergencies.

4.3.3 Knowledge about the gardens

Understanding visitor awareness of Irbid's public gardens is crucial for optimizing engagement and ensuring accessibility, particularly within the context of a health crisis. As detailed in Table 7, this section examines how visitors acquire information about the gardens, providing insights vital for strategic communication and sustained visitation

Table 6: Frequency and length of visitation ($n = 536$)

Statement	Frequency	%
Have you previously visited this garden?		
Yes	471	87.9
No	65	12.1
How many times did you visit this garden so far?		
None	65	12.1
1–10 times	259	48.3
11–20 times	152	28.4
More than 20 times	60	11.2
In general, how frequent per month do you visit gardens?		
Once	363	67.7
Twice	98	18.3
Three or more	75	14.0
Length of stay/visit		
Less than 3 hours	109	20.3
3–5 hours	389	72.6
More than 5 hours	38	7.1
I visit the garden with some company:		
Alone	27	5.0
With children	105	19.6
With family	262	48.9
With friends	142	26.5

Source: Developed by the authors.

during both normal and challenging periods.

Analysis of visitor awareness (Table 7) reveals word-of-mouth (74.3%) as the predominant channel, highlighting the strong role of personal networks in driving visitation. While social media shows promising potential (19.2%), traditional media's limited reach (6.6%) indicates a marketing gap. This reliance on informal channels can bottleneck visitor expansion, especially during a health crisis like the COVID-19 pandemic, where rapid dissemination of safety protocols is crucial. Thus, garden management needs to implement more strategic and diversified marketing, leveraging social media and targeted digital campaigns to effectively reach both current and potential visitors, ensuring these vital green spaces serve the widest possible public during uncertain times.

Table 7: Knowledge about the gardens ($n = 536$)

Statement	Frequency	%
How did you get to know about the garden?		
Newspapers/magazines	11	2.0
Brochures	18	3.4
TV/Radio	6	1.1
Internet	24	4.5
Friends and relatives	398	74.3
Social media	79	14.7
Total	536	100.0

Source: Developed by the authors.

4.3.4 Motives to visit public gardens in Irbid

Understanding the underlying motivations for visiting public gardens in Irbid is crucial for comprehending their perceived value and functional role, particularly during a health crisis. As detailed in Table 8, visitors cited ten distinct factors influencing their garden visits, providing insight into the diverse needs these green spaces fulfil during both normal and challenging periods.

Analysis of visitor motives (Table 8) offers critical insights into the psychological and recreational needs met by Irbid's public gardens, especially during a health crisis. Visitors predominantly sought escape, stress reduction, enjoyment, prior positive experience, and natural beauty. These align with the universal human need for nature connection and respite. The prominence of escape and stress reduction is particularly significant amidst the COVID-19 pandemic, highlighting gardens as vital sanctuaries for mental well-being when other leisure options were limited. Notably, learning and knowledge-seeking were also strong motivations (82.3% and 80.6%), possibly linked to the sample's high education or a shift in crisis-era engagement. This suggests garden management should explore educational programming alongside aesthetic and relaxation elements.

4.3.5 Visitor satisfaction of gardens' services and facilities

Assessing visitor satisfaction with Irbid's public garden services and facilities is crucial for evaluating their perceived quality and ensuring sustained value, especially as these green spaces play a vital role during health crises.

Analysis of visitor satisfaction with Irbid garden services (Table 9) revealed a remarkably high 85% reporting strong satisfaction. This is highly significant given the COVID-19 pandemic, indicating the gardens successfully met visitor expectations despite challenges. This high satisfaction is a crucial predictor of both revisit intentions and positive word-of-mouth (WOM)/eWOM recommendations (Tables 10, 11). These strong intentions highlight the gardens' ability to cultivate a dedicated visitor base and

Table 8: Visitors' motivation to visit gardens in Irbid (multiple responses)

Motivation to visit gardens	Frequency	Percent of cases (%)	Rank	Motives matching with literature
Escape	511	95.3	1	Spiritual/emotional
Relaxation (stress reduction)	495	92.4	2	Spiritual/emotional
Enjoinment	482	89.9	3	Recreational/health
Been before	467	87.1	4	Spiritual/emotional
Admiring beauty and nature	448	83.6	5	Spiritual/emotional
Knowledge/Children learning	441	82.3	6	Educational/intellectual
Social interaction (meeting friends)	437	81.5	7	Social
Entertainment	435	81.2	8	Recreational/health
Knowledge	432	80.6	9	Educational/intellectual
A day out (eating out)	430	80.2	10	Social/recreational
Total	4578	854.1	–	

Source: Developed by the authors.

generate invaluable organic promotion. During a health crisis, robust WOM/eWOM from satisfied visitors becomes even more critical for maintaining visibility and ensuring the continued viability of these essential green spaces.

4.3.6 Visitor future behaviour: Intention to revisit/intention to recommend

Examining visitors' future intentions, this section details their likelihood to revisit Irbid's public gardens and recommend them to others. These indicators are crucial for assessing the gardens' long-term sustainability and resilience, particularly following a health crisis like the COVID-19 pandemic.

Analysis of visitor future behaviour (Tables 10 and 11) indicates exceptionally high intentions to revisit (86.4%) and recommend (85.6%) Irbid's public gardens. These strong positive intentions are a critical indicator of the gardens' enduring appeal and success in delivering satisfying experiences, particularly vital during health crises. High revisit rates suggest a resilient and loyal visitor base, providing operational stability amidst public health uncertainty. Furthermore, strong recommendations highlight word-of-mouth as a powerful marketing tool, crucial for rebuilding public confidence and attracting new visitors after a pandemic. This underscores the importance of prioritizing visitor satisfaction to ensure the long-term viability of green spaces as essential community resources.

Table 9: Satisfaction with garden's services ($n = 536$)

Statement	Frequency	%
Are you satisfied with the services rendered in the gardens?		
Satisfied	454	84.7
Dissatisfied	82	15.3
Total	536	100.0

Source: Developed by the authors.

Table 10: Intention to revisit ($n = 536$)

Statement	Frequency	%
Do you intend to visit the garden again?		
Yes	463	86.4
No	39	7.3
Do not know	34	6.3
Total	536	100.0

Source: Developed by the authors.

4.3.7 Visitor engagement with gardens and COVID-19 restrictions

Visitor engagement with Irbid's public gardens was significantly shaped by health crises including the COVID-19 pandemic, revealing both limitations and the gardens' vital role.

Engagement with public gardens affected during COVID-19 pandemic:

Table 12 clearly details the profound impact of the COVID-19 pandemic on visitor engagement and frequency with public gardens. A substantial 95.7% of respondents reported a negative change in their garden visits due to the pandemic's restrictions and public health concerns. This overwhelming response underscores the severity of the disruption. The remaining 4.3%, likely representing essential garden staff or those with specific exemptions, reported no change, which is consistent with their operational roles. This stark data highlights how health crises can drastically alter public interaction with green spaces, reinforcing the need for adaptive management strategies to sustain engagement during widespread disruptions.

4.3.8 Reasons prevented visitors spending time outside during COVID-19 pandemic

Analysis of factors preventing outdoor time during the COVID-19 pandemic (Table 13) reveals that health crisis-specific concerns predominantly deterred visitors from public gardens. COVID-19 restrictions, social distancing concerns, fear of rule violations, and perceived garden closures collectively accounted for 95% of reported deterrents. This

Table 11: Intention to recommend ($n = 536$)

Statement	Frequency	%
Do you intend to recommend the garden for your relatives and friends?		
Yes	459	85.6
No	37	6.9
Do not know	40	7.5
Total	536	100.0

Source: Developed by the authors.

Table 12: Have your visits to gardens changed due to COVID-19 restrictions? ($n = 536$)

Statement	Frequency	%
Have your visits to public gardens changed negatively due to COVID-19 restrictions?		
Yes	513	95.7
No	23	4.3
Total	536	100.0

Source: Developed by the authors.

overwhelming consensus highlights how public health measures and associated anxieties directly impacted recreational behaviour. The findings underscore the critical need for clear communication from garden management during future crises regarding operational status, safety protocols, and permitted activities to mitigate public apprehension and encourage continued, safe engagement with green spaces.

5 Discussion

This study found Irbid's public gardens played a critical, resilient role amidst the widespread disruption of the COVID-19 pandemic, a global health crisis. Despite general tourism declines, residents consistently visited for enjoyment, relaxation, and nature, affirming gardens as vital sanctuaries for well-being during periods of heightened stress and restricted movement. While experiences were largely positive, safety concerns highlight the imperative for adaptive management and clear communication essential for navigating future health crises effectively.

ANOVA revealed significant demographic differences in visitor satisfaction across eight key factors, including relaxation, safety, accessibility, staff, children's areas, food, parking, and overall satisfaction (Table 14; $p \leq 0.05$). While eleven services received positive ratings ($means \geq 3.0$), ten also showed significant group variations. Although 84.7% reported positive experiences, a notable 15.3% were dissatisfied, highlighting diverse needs

Table 13: Reasons preventing visitors from spending time outside during COVID-19 pandemic ($n = 536$)

Statement	Frequency	%
COVID-19 pandemic restrictions	177	33.0
I am not being able to keep my distance from people	118	22.0
I am worried about breaking the COVID-19 restrictions	112	21.0
I think access to public gardens has been restricted	102	19.0
I would not be able to use the facilities I need, due to the pandemic	16	3.0
I am not leaving home at all	6	1.1
I do not have the time to get out to green and natural spaces	5	0.9
Total	536	100.0

Source:

Developed by the authors.

and areas for targeted improvement by Irbid Municipality (Table 9).

The regression analysis, detailed in Table 15, significantly predicted overall visitor satisfaction ($F = 23.5, p \leq 0.001$), explaining 11.8% of the variance (Adjusted $R^2 = .113$). This indicates that facilities and infrastructure, the on-site environment, and visitors' escape/relaxation motives collectively contribute meaningfully to satisfaction. Specifically, Facilities & Infrastructure emerged as the most potent driver ($\beta = 0.24, p \leq 0.001$), highlighting the critical role of tangible amenities. On-site environment quality also showed a significant positive effect ($\beta = 0.16, p \leq 0.001$), underscoring the importance of perceived surroundings. While the escape/relaxation motive had a weaker, borderline significant influence ($\beta = 0.08, p = 0.050$), its impact was less pronounced than tangible and environmental factors. Collectively, these findings emphasize the primacy of robust infrastructure and effective environmental stewardship in shaping visitor satisfaction, suggesting that external, experiential factors are more dominant than personal motives. This highlights the importance for managers to prioritize investments in physical improvements and environmental preservation to ensure high visitor satisfaction.

The COVID-19 pandemic profoundly disrupted visitor engagement with public gardens, unequivocally demonstrating the widespread behavioral shift consistent with a severe health crisis. A vast majority of respondents (95.7%) reported a significant reduction in their garden visits during this period (Table 12), reflecting the direct impact of restrictions and public health concerns. Further ANOVA analysis (Table 16) revealed a statistically significant impact ($p \leq 0.050$) across all assessed visitor motives. The consistent mean scores below 2.0 indicate that the pandemic not only curtailed physical

Table 14: Visitors' evaluation of Irbid gardens – One-Way ANOVA Test ($n = 536$)

Statement	Mean	SD	Rank	F	Sig.
Relaxation and enjoiment	4.06	0.750	1	2.529	0.020
Safety and security	3.97	0.960	2	2.857	0.010
Accessibility and transportation	3.70	1.071	3	10.521	0.000
Trails	3.66	1.033	4	0.964	0.449
Staff	3.61	1.090	5	2.330	0.031
Children playing area	3.57	1.156	6	4.750	0.000
Sport facilities	3.47	0.598	7	0.220	0.970
Green areas	3.42	1.189	8	0.579	0.747
Appeal	3.39	1.041	9	0.752	0.608
Seats and benches	3.38	1.072	10	0.579	0.540
Lighting	3.38	1.094	11	0.839	0.540
Food and beverages	2.81	0.931	12	2.713	0.013
Parking areas	2.75	0.850	13	2.600	0.017
Cleanliness & hygiene	2.64	1.282	14	0.627	0.709
Visitor information	2.59	1.259	15	0.915	0.483
First Aid	2.50	1.310	16	0.376	0.894
Entertainment facilities	2.35	1.187	18	2.203	0.041
Prayer rooms	2.24	0.815	19	0.322	0.925
Overall evaluation (satisfaction)	4.01	0.881	20	2.291	0.034

Source:

Developed by the authors.

Table 15: Linear Regression Analysis of visitors' satisfaction of Irbid gardens

Predictor (factor mean, 1 = strongly disagree → 5 = strongly agree)	Un-std. β	95% CI	Std. β	t	p
Facilities & infrastructure	0.280	0.177 – 0.383	0.24	5.34	0.001
On-site environment (cleanliness, tranquil, natural beauty)	0.182	0.079 – 0.284	0.16	3.49	0.001
Motive: Escape/relaxation	0.100	0.000 – 0.199	0.08	1.96	0.050

Note: CI = Confidence Interval; Un-std. β = Unstandardized coefficient; Std. β = Standardized coefficient.

Table 16: How significant did your visits to gardens change due to COVID-19 restrictions? ($n = 536$)

Statement	Mean	SD	Rank	F	Sig.
To take children outside	1.80	0.485	1	906.813	0.000
To explore new nature spaces	1.21	0.504	2	694.971	0.000
To escape the routine	1.21	0.502	3	715.806	0.000
To enjoy the weather	1.21	0.490	4	737.952	0.000
To get break from TV/electronics	1.20	0.498	5	749.556	0.000
For physical health and exercise	1.20	0.498	6	749.556	0.000
To meet friends	1.20	0.495	7	786.700	0.000
To enjoy the garden	1.20	0.494	8	799.925	0.000
To entertain myself	1.20	0.494	9	799.925	0.000
To learn something new	1.19	0.490	10	842.449	0.000
To relax	1.19	0.493	11	813.609	0.000
Overall change	1.25	0.495	–	781.569	0.000

Source: Developed by the authors.

access but also diminished the perceived importance or feasibility of various motivations for visiting gardens, such as escape or learning, likely due to altered priorities or heightened perceived risks. This comprehensive disruption of both visitation frequency and underlying motives underscores the immense challenge health crises pose to maintaining public engagement with vital green spaces, highlighting the need for adaptive strategies to preserve their functional and psychological roles.

5.1 Hypotheses testing

Hypothesis testing was central to addressing the study's aim of understanding visitor engagement in Irbid's public gardens during health crises, particularly amidst the COVID-19 pandemic. Utilising one-sample t-tests, three key hypotheses were evaluated to ascertain significant aspects of visitor experience and behaviour, with detailed findings presented in the subsequent section.

5.1.1 H_1 : Visitors' main motivations to visit public gardens in Irbid are to escape, relaxation, and enjoyment

Hypothesis 1, stating that visitors are primarily motivated to visit Irbid's public gardens for escape, relaxation, and enjoyment, is strongly supported. A significant majority cited these as primary reasons (escape: 95.3%; relaxation: 92.3%; enjoyment: 89.9%). One-sample t-tests confirmed their robust statistical significance ($t = 144.658, 128.686, 153.096$, $p < 0.001$), indicating their widespread influence. This highlights the critical role of pub-

Table 17: One sample T-Test of visitors' overall satisfaction of gardens' and services ($n = 536$)

Statement	Mean	St. dev.	t	Sig.	Result (hypothesis)
Visitors were satisfied with gardens' services/facilities.	4.01	0.881	105.398	0.000	Accepted

Source: Developed by the authors.

lic gardens as essential sanctuaries for psychological well-being, offering vital respite and normalcy during health crises like the COVID-19 pandemic, when traditional leisure options are limited. These findings reinforce the inherent human need for nature-based comfort and stress reduction in challenging times.

5.1.2 H_2 : Visitors were satisfied with the services offered at Irbid gardens.

Hypothesis 2, which postulated that visitors were satisfied with Irbid garden services, is strongly confirmed. A one-sample t-test ($t = 105.398, p < 0.001$) revealed statistically significant visitor satisfaction with facilities and services, evidenced by a substantial mean difference of 4.01 (Table 17). This remarkably high satisfaction is particularly noteworthy amidst the COVID-19 pandemic, suggesting Irbid gardens effectively met visitor expectations despite the health crisis. This sustained satisfaction indicates the gardens' resilience and their capacity to provide essential community value, fostering trust and visitation during and beyond times of crisis.

5.1.3 H_3 : Most visitors have the intention to revisit and to recommend the gardens

Hypothesis 3 stating that most visitors intend to revisit and recommend the gardens, is strongly supported. A significant majority expressed high intentions to revisit (86.4%) and recommend (85.6%) them (Tables 10, 11). One-sample t-tests confirmed the statistical significance of both intentions (revisit: $t = 51.827, p < 0.001$; recommend: $t = 49.822, p < 0.001$), highlighting their robust presence. These exceptionally high rates of loyalty and advocacy are crucial during a health crisis, signalling the gardens' success in providing a valued experience and encouraging continued engagement. This strong positive word-of-mouth is invaluable for maintaining visibility and rebuilding public confidence, ensuring these vital green spaces remain relevant and utilised community assets.

5.1.4 H_4 : Health crises, including the COVID-19 pandemic, notably restrict most individuals' opportunities for outdoor engagement

Hypothesis 4, stating that health crises like the COVID-19 pandemic restrict outdoor engagement, is strongly supported. An overwhelming 95% of respondents identified pandemic-related barriers to outdoor time (Table 13), including restrictions, social distancing concerns, and perceived access limitations. A one-sample t-test ($t = 39.045, p < 0.001$) confirmed the statistical significance of these deterrents. This highlights the profound impact of health crises on outdoor behaviour and the critical need for transparent communication and adaptive management to facilitate safe green space engagement during future public health concerns.

6 Conclusion, recommendations, and further research

This study offers compelling evidence regarding the critical role of public green spaces in fostering tourist engagement, particularly during periods of health crises. By analysing visitor behaviour in Irbid's public gardens during the COVID-19 pandemic, this research provides invaluable foresight into how such spaces can mitigate the impacts of future widespread disruptions. Despite the significant decline in overall visitation experienced during the COVID-19 pandemic, visitors consistently sought these gardens for essential escape, relaxation, and connection with nature, underscoring their pivotal function in well-being and consistently expressing intentions to revisit and recommend. A robust regression analysis further solidified these insights, conclusively demonstrating that visitor satisfaction was overwhelmingly driven by facilities & infrastructure (emerging as the predominant factor), the on-site environment (including cleanliness, tranquillity, and natural beauty), and visitors' intrinsic escape/relaxation motive. Crucially, while garden tourism is confirmed as a vital niche for stress reduction and social connection, our findings unequivocally highlight significant systemic deficiencies that directly undermine visitor experience and limit growth potential. These critical shortcomings include inadequate restrooms, food and beverage options, prayer facilities, handicap accessibility, parking, water features, and basic first-aid provisions. Furthermore, the current reliance on word-of-mouth for marketing is insufficient. To secure and enhance visitor satisfaction, attract broader tourist segments, and realize the full potential of these green assets in the face of future crises, it is imperative that Irbid Municipality prioritises a comprehensive strategy. This must include immediate and substantial investment in addressing identified service gaps, implementing rigorous safety measures, fundamentally improving overall infrastructure, and diversifying offerings with engaging outdoor events, educational programs, and accessible bilingual resources, ideally through collaborative community partnerships. Looking ahead, validating and expanding upon these initial insights is essential for building robust resilience against future public health challenges. Future research must broaden its geographic scope beyond Irbid to other Jordanian cities, notably Amman, to ascertain regional variations and enhance generalisability. Longitudinal studies are critically needed to track the long-term impacts of health crises like the COVID-19 pandemic and other influencing factors on garden tourism. Com-

plementary qualitative research can provide deeper, nuanced understanding of visitor motivations and experiences. While cross-sectional and localised, this study provides a foundational understanding for garden management and tourism development, offering actionable intelligence vital for navigating present and future challenges in fostering robust tourist engagement with public green spaces.

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