



Research article

Evaluating perceived value and expected value gaps based on patient experience during outpatient encounters: An empirical study in China

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ABSTRACT

Background: Improving the quality of care relies on understanding patients' perceptions and expectations based on their experiences. The study aimed to determine the gaps between patients' perceived value and expected value, and to identify critical areas for outpatient service improvement.

Method: This cross-sectional study was conducted in China from November 2020 to February 2021. A sample of 572 outpatients, randomly selected from a comprehensive tertiary public hospital, was surveyed using a validated patient perceived value questionnaire. Importance-performance analysis was used to evaluate the differences between patients' perceived and expected value.

Results: The scores of patients' expected value for outpatient services were significantly higher than their perceived value in all 29 items and 8 dimensions. The items with the highest and lowest gaps were "short waiting time" (−1.52) and "hospital reputation and popularity" (−0.24) respectively, and the dimensions of price and efficiency (functional value) were located in the quadrant of high expectation and low perception.

Conclusion: Our findings are useful for hospital administrators and policymakers to identify strategic focus areas and allocate resources rationally and effectively. We suggest healthcare providers should take measures to narrow the gaps, especially in terms of service efficiency and price.

1. Introduction

With an increasing emphasis on patient-centred care, medical institutions are recognizing the necessity of delivering high-quality

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services to meet patients' expectations [1,2]. Patients increasingly play an active role in their healthcare, seeking personalized, efficient, and effective care, rather than being passive recipients. Traditionally, technical and clinical outcomes are often used to determine the quality of health services, but it is now commonly acknowledged that patient perceptions and evaluations have a significant impact on promoting overall quality of care [3].

In China, public hospitals serve as the primary providers of outpatient services, catering to approximately 80 % of the total outpatient care. As major entry points for ambulatory care, outpatient clinics generally provide patients with flexible and convenient medical services and play an important role in the Chinese healthcare system [4]. During outpatient encounters, patients' perceived value directly influences their healthcare experience and treatment outcomes. This perception encompasses not only the precision and effectiveness of medical technology but also factors such as effective communication with healthcare professionals, the efficiency of the treatment process, and the comfort of the clinical environment [5]. This underscores the significance of addressing patients' needs, preferences, and expectations to enhance their overall healthcare experience [6]. However, there may be a contrast between patients' expected experiences and their actual perception of services, which often results in dissatisfaction and undermines trust in the healthcare system [2]. Therefore, it is urgent for healthcare providers to identify and bridge these gaps, thereby enhancing the overall patient experience and aligning the value of health services with patient expectations.

Previous studies have found differences between patients' expectations and their perceptions of health services, and these differences have been employed to evaluate the quality of medical services [7–10]. The difference between customers' perceptions and expectations serves as a criterion for evaluating service quality in early models of user satisfaction assessment [11]. Parasuraman et al. [12] introduced the concept of the "service quality gap" and identified five dimensions of service quality: reliability, responsiveness, assurance, empathy, and tangibles. Further studies employed the SERVQUAL model to identify gaps in service quality in healthcare, highlighting the influence of these gaps on patient satisfaction [13,14]. The SERVQUAL model has been widely used to study medical service quality disparities, particularly in developing countries [10,15,16], but this model may overestimate patient expectations [17]. Investigating the factors that contribute to gaps in health service quality can help identify specific areas for improvement, potentially leading to enhanced patient satisfaction and better healthcare outcomes [14,18]. Furthermore, most of the existing research has primarily focused on identifying deficiencies in healthcare delivery and addressing factors contributing to disparities in health service quality [19–21], and limited attention has been devoted to understanding the patient experience during outpatient encounters [22, 23]. However, the Expectancy Disconfirmation theory provides a powerful framework for explaining service experiences. According to this theory, individuals experience positive disconfirmation and higher satisfaction when the perceived performance of a service exceeds their expectations. This theory has been explored for its applicability in measuring patients' perceptions and satisfaction with healthcare services, assessing patient experiences, and predicting behavioral intentions [24,25]. We measured patients' expectations of outpatient services (pre-service expectations) and their actual perceptions of service performance (post-service perceptions) using an empirically validated patient perceived value scale. Disconfirmation was then determined by calculating the difference between the perceived service value and expectations. By identifying discrepancies between perceived performance and expected value, we located key areas impacting patient satisfaction, guiding targeted improvements in outpatient services through theoretical application.

Therefore, our study aimed to evaluate the quality of outpatient services from the perspective of patients' perceived value by exploring the gaps between patients' perceptions and expectations. To effectively bridge these gaps, we employed the Importance-Performance Analysis (IPA) method to identify critical areas that require improvement in outpatient services. The findings will help develop targeted strategies for optimizing outpatient health services, ultimately supporting hospital administrators in delivering high-value healthcare services.

2. Methods

2.1. Study design and sampling

This cross-sectional study was conducted from November 2020 to February 2021. A convenience sampling method was employed, targeting outpatients visiting a general tertiary public hospital in Wuhan, Hubei Province, China. The hospital, comprising three branches, caters to a diverse patient demographic and serves as a representative institution for patient reception. The inclusion criteria for participants were: (1) aged 18 years or older; (2) provided informed consent; (3) voluntarily participated in the survey; (4) completed the entire outpatient visit procedures; and (5) capable of independently and accurately describing their experiences.

We conducted face-to-face questionnaire surveys by randomly sampling eligible participants in the hospital's outpatient lobby. Well-trained interviewers engaged in one-on-one interactions with the respondents. In terms of sample size estimation, we adhered to the general guideline that the sample size should be 10 to 15 times the number of items in the questionnaire to ensure the statistical power of the study. A total of 600 questionnaires were distributed in this study, and 572 valid responses were collected, yielding an effective response rate of 95.3 %.

2.2. Measurement questionnaire

The measurement questionnaire was based on our previous research, and the Outpatient Perceived Value Scale, which includes 29 items and 8 dimensions, has been validated in the setting of Chinese public hospitals [26]. Our survey was divided into two parts, the first of which contained questions relating to the patient's socio-demographic characteristics, including age, gender, and department attended. The second part was designed to measure the patient's perceived value and expected value of outpatient service quality, which contained two subscales of a 'perception' section and an 'expectation' section (see supplementary material). The assessment of

patients' perceived value and expected value employed a consistent set of indicators and matching statements, ensuring coherence and continuity in evaluating patients' experiences of outpatient health service. To address common method bias, the questionnaire was designed to separate perception and expectation questions and to anonymize responses to encourage honesty.

Specifically, the statements in both perception and expectation sections were categorized into eight dimensions of patient value: image (social value), installation (functional value), efficiency (functional value), price (functional value), service quality (functional value), interactive (emotional value), control (emotional value), and accessibility (social value). The evaluation of patient value in this study comprised two stages throughout the entire outpatient experience: outside the visit and during the visit. The first stage of A items focused on assessing the patients' perception and expectation concerning various aspects of outpatient services before and after their visit. The second stage of B items aimed to evaluate their value perception and expectation levels during the actual visit. A 5-point Likert scale was used for the scoring, with 1 indicating "strongly disagree" and 5 indicating "strongly agree".

2.3. Statistical analysis

We used Excel (Microsoft) and SPSS V.23.0 (IBM Corp) as statistical tools for analysis. Descriptive statistics were conducted to summarize the general characteristics of respondents and to describe the gap scores between outpatients' perceived value and expected value. One-way analysis of variance (ANOVA) was employed for normally distributed data, and the Kruskal-Wallis test was utilized for non-normally distributed data to examine the relationship between participants' characteristics, with a significance level set at 0.05. Differences between patients' perceived value and expected value were analyzed using t-tests to determine the significance of the gaps.

2.4. Importance-performance analysis

IPA is a valuable research methodology for analyzing factors that influence customer satisfaction with services or products. This approach involves plotting the importance and performance levels of various attributes on a two-dimensional grid. The importance level of the vertical axis represents how significant a particular attribute is to customers, while the performance level of the horizontal axis indicates how well the attribute is currently being delivered, as shown in Fig. 1. Compared to other methodologies, IPA employs a four-quadrant matrix, facilitating customized analyses of service attributes while systematically highlighting the strengths and weaknesses of services [27]. This approach serves as a strategic guide for improvement by effectively identifying and prioritizing areas critical for outpatient services, based on the assessment of the gap between patients' perceived and expected value. Such identification allows healthcare providers to focus their efforts and allocate their limited resources towards improving specific aspects of care delivery, ultimately maximizing the value provided to patients. These assessments are vital for enhancing hospital efficiency and accurately identifying patient needs in the competitive healthcare market today.

In the study, we utilized patients' expectations of outpatient service quality to measure the importance of some specific indicators for outpatient experience, while patients' actual perceptions were used to assess the performance level of the same indicators. The items in the lower left quadrant, indicating both low expectations and perceptions, were deemed a secondary priority for improvement. Items located in the upper left quadrant, characterized by high expectations but low perceptions, were identified as the top priority for improvement.

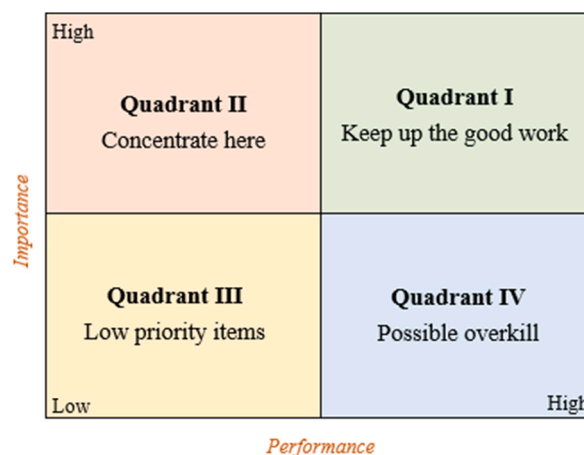


Fig. 1. Quadrant diagram of the importance-performance analysis matrix.

3. Results

3.1. General characteristics of the participants

Detailed characteristics of participants are shown in Table 1. In this study, approximately 60 % of the participants were female, and the majority of the surveyed population belonged to the 21–40 age group. The overall level of education was relatively high, with 69.5 % of respondents having received a college education or above. The results revealed that younger participants (aged 18–20) exhibited higher perceptions and lower expectations regarding outpatient services compared to other age groups.

There were significant differences in both patients' perceived and expected value of outpatient health services depending on different self-rated health status, and patients' expected value was significantly affected by age and marital status ($P < 0.05$).

3.2. Gaps between perception and expectation of patient value in outpatient services

The survey analysis demonstrated gaps between patients' perceived and expected value in the outpatient setting, with expectations consistently higher than perceptions. Table 2 highlights that the greatest gap was observed in the item of 'short waiting time' (−1.52), and the smallest gap was observed in the item of 'hospital reputation and popularity' (−0.24).

The overall perceived value score of the patients was 3.89 ± 0.57 , while the expected value score was 4.66 ± 0.46 . The overall difference value between patient perception and expectation was -0.77 . A paired-sample *t*-test was conducted on 572 participants showed that perceptions were significantly lower than expectations ($t = -29.899$, $P < 0.001$). The results in Table 3 showed a significant gap between perceptions and expectations across all eight dimensions of patient value in outpatient services ($P < 0.001$).

Table 1
Differences in variables according to respondents' general characteristics.

Characteristic	n	Perception			Expectation		
		Mean (SD) ^a	F/H	<i>P</i> ^b	Mean (SD)	F/H	<i>P</i> ^b
Gender							
Male	228	3.91 (0.59)	0.924	0.36	4.66 (0.47)	−0.320	0.75
Female	344	3.86 (0.55)			4.67 (0.45)		
Age							
18-20	31	4.04 (0.61)	5.888	0.12	4.51 (0.50)	22.456	<0.001
21-40	440	3.86 (0.54)			4.65 (0.43)		
41-60	86	3.92 (0.70)			4.76 (0.46)		
≥61	15	4.06 (0.48)			4.77 (0.84)		
Education							
Postgraduate and above	58	3.82 (0.51)	0.462	0.63	4.67 (0.38)	0.327	0.72
College/Undergraduate	340	3.88 (0.56)			4.65 (0.46)		
High School and below	174	3.91 (0.61)			4.68 (0.47)		
Occupation							
Administrative staff	110	3.85 (0.59)	7.921	0.24	4.67 (0.43)	10.235	0.12
Professional and technical staff	104	3.98 (0.56)			4.66 (0.44)		
Worker/service staff	71	3.97 (0.57)			4.75 (0.32)		
Private entrepreneur	69	3.79 (0.58)			4.72 (0.49)		
Students	93	3.87 (0.53)			4.59 (0.45)		
Unemployed/retired	47	3.80 (0.69)			4.68 (0.58)		
Others	78	3.85 (0.50)			4.61 (0.51)		
Marital status							
Unmarried	214	3.89 (0.53)	0.294	0.86	4.59 (0.45)	15.566	<0.001
Married	349	3.87 (0.59)			4.71 (0.46)		
Other	9	3.85 (0.71)			4.72 (0.40)		
Household registration							
Urban	350	3.85 (0.57)	2.540	0.11	4.66 (0.46)	0.081	0.78
Rural	222	3.93 (0.57)			4.67 (0.45)		
Self-rated health status							
Poor	73	3.73 (0.62)	5.270	0.002	4.55 (0.54)	3.255	0.03
Fair	243	3.85 (0.57)			4.66 (0.45)		
Good	256	3.96 (0.55)			4.70 (0.44)		
Outpatient type							
General clinic	122	3.89 (0.58)	0.029	0.86	4.65 (0.46)	0.402	0.53
Specialist clinic	450	3.88 (0.57)			4.67 (0.46)		
Medical specialty							
Surgery	212	3.93 (0.52)	6.419	0.09	4.66 (0.45)	3.441	0.33
Internal medicine	95	3.97 (0.65)			4.69 (0.51)		
Gynecology	89	3.81 (0.54)			4.70 (0.44)		
Others	176	3.82 (0.59)			4.64 (0.45)		

^a SD: standard deviation.

^b *P*: value of the ANOVA for normal distribution, value of the Kruskal-Wallis test for non-normal distribution.

Table 2
Differences between perception and expectation of patient value items in outpatient.

Item	Perception (mean,SD)	Expectation (mean,SD)	Gap ^a	Sorting of gaps
Image (social value)				
A1.hospital reputation and popularity	4.41 (0.75)	4.65 (0.65)	-0.24	29
A2. doctor authority	4.26 (0.80)	4.65 (0.63)	-0.39	28
A3. advanced equipment	4.35 (0.71)	4.76 (0.54)	-0.41	27
A4.informative access procedures	4.28 (0.82)	4.70 (0.59)	-0.42	26
Installation (functional value)				
A5. environmental cleanliness	3.70 (0.91)	4.60 (0.66)	-0.90	9
A6. Comfort and quietness	3.12 (1.02)	4.55 (0.73)	-1.43	2
A7. reasonable space layout	3.48 (0.94)	4.57 (0.71)	-1.09	5
A8. medical guide signs	3.96 (0.89)	4.69 (0.61)	-0.73	15
Efficiency (functional value)				
A9. short registration time	3.66 (1.06)	4.68 (0.66)	-1.02	6
A10. short payment time	3.93 (0.94)	4.73 (0.72)	-0.80	11
A11. short drug getting time	3.78 (0.99)	4.53 (0.59)	-0.75	14
A12.short time to obtain medical reports	3.41 (1.03)	4.65 (0.63)	-1.24	4
A13. Short waiting time	3.24 (1.14)	4.76 (0.58)	-1.52	1
Price (functional value)				
A14. reasonable charges	3.60 (0.87)	4.71 (0.58)	-1.01	7
A15. affordable medical costs	3.39 (0.96)	4.67 (0.65)	-1.27	3
A16. good service for price	3.85 (0.83)	4.70 (0.63)	-0.85	10
Service Quality (functional value)				
B1.physician efforts to understand needs	3.98 (0.87)	4.63 (0.67)	-0.65	17
B2. Professional treatment	4.23 (0.76)	4.79 (0.54)	-0.56	23
B3.Courteous, polite and respectful	4.14 (0.84)	4.63 (0.65)	-0.49	25
B4.Serious, responsible and trustworthy	4.21 (0.79)	4.75 (0.57)	-0.54	24
Interactive (emotional value)				
B5.understandable medical advice	4.07 (0.81)	4.70 (0.60)	-0.63	19
B6. enough time for physician-patient communication	3.62 (1.03)	4.62 (0.69)	-1.00	8
B7. participate in treatment programs	3.60 (0.99)	4.38 (0.85)	-0.78	12
Control (emotional value)				
B8. inform risk and seek consent	3.95 (0.87)	4.67 (0.62)	-0.72	16
B9. patient privacy	4.11 (0.79)	4.69 (0.62)	-0.58	21
Accessibility (social value)				
B10. safe and reliable medical services	4.18 (0.72)	4.76 (0.57)	-0.58	21
B11. prevention and health promotion	4.13 (0.75)	4.77 (0.54)	-0.64	18
B12. promote healthy lifestyle	4.02 (0.83)	4.62 (0.70)	-0.60	20
B13. received the desired service	3.96 (0.83)	4.72 (0.60)	-0.76	13

^a The difference between the perception value and expectation value.

Table 3
Comparison of the perception and expectation in eight dimensions of patient value in outpatient.

Dimension	Perception (mean,SD)	Expectation (mean,SD)	Perception – Expectation (mean,SD)	t	p
Image (social value)	4.33 (0.59)	4.69 (0.50)	-0.36 (0.65)	-11.312	<0.001
Installation (functional value)	3.56 (0.77)	4.60 (0.59)	-1.04 (0.89)	-25.632	<0.001
Efficiency (functional value)	3.60 (0.79)	4.67 (0.65)	-1.07 (0.97)	-24.753	<0.001
Price (functional value)	3.62 (0.74)	4.69 (0.56)	-1.07 (0.88)	-27.687	<0.001
Service quality (functional value)	4.14 (0.72)	4.70 (0.51)	-0.56 (0.79)	-15.192	<0.001
Interactive (emotional value)	3.76 (0.80)	4.57 (0.59)	-0.81 (0.90)	-19.337	<0.001
Control (emotional value)	4.03 (0.75)	4.67 (0.56)	-0.65 (0.83)	-16.530	<0.001
Accessibility (social value)	4.07 (0.68)	4.72 (0.52)	-0.64 (0.71)	-18.009	<0.001
Total patient value	3.89 (0.57)	4.66 (0.46)	-0.77 (0.63)	-29.899	<0.001

3.3. Importance-performance analysis of Patient value

The IPA diagram was divided into four quadrants based on the median perception value of 3.89 and the median expectation value of 4.66. Fig. 2 provides a comprehensive overview of the distribution of outpatient value across different dimensions, and we can identify specific items that need to be improved in outpatient service from Fig. 3.

The IPA matrix analysis showed that twelve items from four dimensions fell into quadrant I of “Keep up the good work”, which represents an area of high perception value and high expectation value. Items in this area indicated that hospital outpatient services performed well with respect to image, accessibility, risk control, and service quality. Quadrant II of “Concentrate here” captured dimensions of price and efficiency (functional value), which represents an area of high expectation value and low perception value, requiring closer attention for improvement. Dimensions related to emotional value, particularly the interactive aspects of care, fell into quadrant III of “Low priority items” with low perception and expectation value. When evaluating patients’ overall value dimensions,

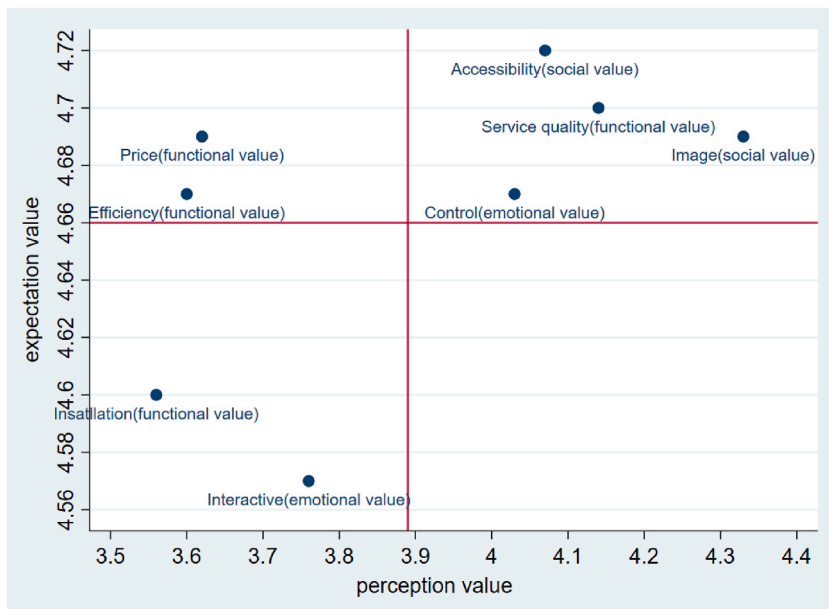


Fig. 2. Importance-performance analysis of patient value in different dimensions.

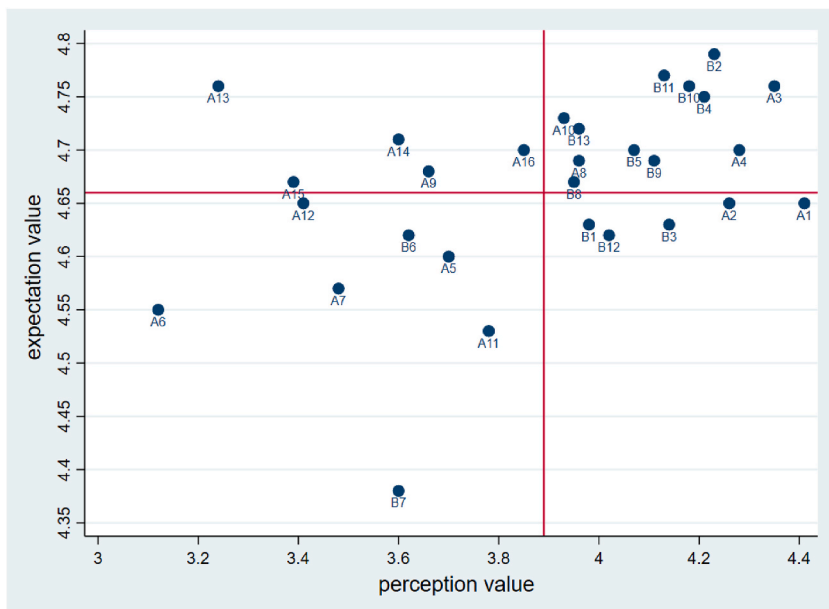


Fig. 3. Importance-performance analysis of patient value in different items.

no dimension was placed in the “Possible overkill” quadrant of high perception and low expectation.

4. Discussion

4.1. Statement of principal findings

The scores for patients’ expected value of outpatient services were significantly higher than their perceived value across all 29 items and eight dimensions. There were significant differences between participants of different ages, marital status and health conditions in terms of the gaps between their expectations and perceptions. Particularly, the dimensions of price and efficiency (functional value) emerged as areas that healthcare providers should prioritize to enhance the patient experience and meet patients’ expectations for

outpatient healthcare.

4.2. Interpretation within the context of the wider literature

The study revealed a negative gap between patients' perception and their expectations of outpatient health services, which was consistent with similar studies in other countries [8,19,28,29]. In our study, the largest gaps were related to the item of "short waiting time" (-1.52) in the efficiency dimension. Relevant research has shown that patients care about the waiting time and efficiency in outpatient clinics [23,30], as it directly impacts their satisfaction [31]. However, doctors frequently face difficulties in delivering timely treatments, leading to long wait times for patients during outpatient visits [32]. This delay may increase patients' anxiety and adversely affect their overall healthcare experience. Moreover, the results are consistent with Farrokhi et al.'s study [33], which indicated that responsiveness was identified as the weakest dimension. The findings from a study conducted in outpatient clinics in Canada indicate that patients have the least positive perception when it comes to receiving timely services [34].

Furthermore, the results showed that the smallest gap was in the item related to the image dimension, "hospital reputation and popularity" (-0.24). This contrasts with Marzban et al. [35], who emphasized that the 'assurance' dimension, defined as the guarantee of a specific level of outpatient service, was considered the most significant dimension with the highest scores. Similarly, Lin et al. found that assurance of health service quality was most expected and perceived by patients [22]. Other studies have shown that the tangibility dimension obtained the highest perception mean score and the lowest quality gap [22,36]. This suggests the tangible dimensions play a crucial role in compensating for deficiencies in other service quality dimensions [16,37], such as the provision of advanced medical facilities and improvements in the physical environment, which can enhance patients' positive perceptions [38]. However, our study revealed that perceptions of the installation dimension in hospital outpatient services were low. These differences highlight that although hospitals in China are highly recognized by patients for delivering reliable and professional services, there is a significant shortfall in meeting patients' expectations regarding the tangible aspects of healthcare environments and facilities. Therefore, increasing attention and investment in the physical environment of hospitals are crucial for enhancing patient satisfaction and strengthening hospital competitiveness.

According to our IPA results, we found that the area where patients have high expectation and perception value ("keep on the good work" quadrant) include dimensions such as the image, accessibility, service quality, and patient safety risk control. To maintain the hospital's reputation and patient loyalty, these aspects must be continuously enhanced, which are considered to be the competitive advantage of the hospital [6,39]. We categorized image and accessibility as social values because they are related to the overall perception and inclusion of healthcare services. Additionally, considering emotional factors such as patient safety is crucial for fostering empathy among healthcare professionals. Our emphasis on social and emotional values set us apart from other findings as we recognized the importance of adopting a holistic approach to address patient needs. Notably, the functional value of price and efficiency should be concentrated on, and these dimensions require immediate attention by hospital managers to address the main weakness of this area. Our analysis reveals an urgent need for improvement in the efficiency dimension, particularly in patient registration and waiting time, followed by obtaining medical reports and getting medicine time. Patients had the highest perception of the relative speed of the payment process, which may be attributed to the adoption of mobile payments in China. Research underscore the significant influence of reduced waiting times and affordable medical costs on patient healthcare experiences [23,37], suggesting that innovations such as telemedicine and online counselling should be promoted through policy initiatives [40]. The government could play a role by subsidizing more outpatient service costs and integrating them into medical insurance schemes to address these gaps [41]. Enhancing efficiency, ensuring price transparency, and maintaining affordability are key to improving patient satisfaction and addressing major concerns, thereby fostering better healthcare experiences [42].

Additionally, our study uniquely focused on patients' experiences and feelings in terms of emotional value, setting it apart from other healthcare quality studies [9,22]. Specifically, the perceptions and expectations regarding doctor-patient interactions were generally rated low. This suggests that the importance of communication and interaction between healthcare providers and patients is often neglected and undervalued. Supported by relevant studies, our findings emphasized the critical need for improved physician-patient communication and patient engagement to increase patient satisfaction [39,43,44]. Interestingly, no dimensions fall into quadrant IV of "possible overkill". This indicated that despite the need for improvements in certain areas, there is no significant waste of healthcare resources on excessive or unnecessary measures. By analyzing these dimensions, we can pinpoint improvement areas to boost patient experience and the overall perceived value of care.

Our study found that older individuals and those who are married have higher expectations for outpatient services. This may be attributed to the increased demand for medical care among these patients and their desire for more personalized attention. Additionally, patients' perceived and expected value of outpatient services may be influenced by their current health status. This finding aligns with other studies where health status was confirmed as a determinant of patient satisfaction with service quality [31,45]. Individuals dealing with more severe health issues may require more comprehensive care, thus expecting higher quality services. Therefore, considering these factors can aid healthcare providers in better meeting the needs and expectations of patients [42].

4.3. Implications for policy, practice, and research

Our study focused on the outpatient experience, with a specific emphasis on patients' perceived value throughout their entire visit. Moreover, we identified and systematically categorized gaps between patient perceptions and expectations in outpatient settings through quantitative analysis. This analysis facilitates the prioritization of areas that urgently need improvement and those that can be addressed later, thereby providing a strategic framework to enhance outpatient service.

Additionally, we recommend that policymakers concentrate on areas requiring special attention, effectively allocating health resources to improve the functional value of outpatient medical services. Healthcare providers should emphasize the social and emotional aspects of patients' needs to promote a better outpatient experience. By addressing these identified gaps, hospitals can significantly improve outpatient services and increase patient satisfaction, contributing to the sustainable development of public hospitals. Our study offers valuable insights for healthcare providers in developing countries to minimize the provision of low-value healthcare services, thereby supporting the development of healthcare systems.

4.4. Future research directions and limitations

There are several limitations to this study. Firstly, the potential subjective bias inherent in self-reported data and the use of convenience sampling may limit the generalizability of our findings. Secondly, the sampled hospitals in this study are all high-quality public tertiary hospitals, and patients' expectations may have been raised. Finally, although our study proposed improved solutions for outpatient health services, these strategies lack application and validation in practice.

Therefore, future research should extend to a broader range of medical institutions and cultural backgrounds, enriching our understanding of outpatient service across various healthcare systems and enhancing the relevance of our findings. Based on the identified key areas and improvement points from the research results, further optimization of outpatient service processes can provide a reference for lean management in hospitals [46]. Future research in this field is crucial for improving the quality of healthcare and patient satisfaction in outpatient environments. Emphasis should be placed on implementing enhancements in hospital settings to develop more reliable and replicable management strategies.

5. Conclusion

Patients' perceived value of outpatient services fell short of their expected value in general. Therefore, efforts are necessary to bridge these gaps between the perception and expectation value based on patients' experiences. Particularly in terms of service price and efficiency, healthcare providers should deliver high-quality ambulatory comprehensive services that meet patient demands and expectations. The findings of this study will help hospital administrators and policymakers identify strategic focus areas, enabling the rational and effective allocation of resources to enhance the overall quality of outpatient services.

Ethics and other permissions

The study was approved by the Ethics Committee of Tongji Medical College of Huazhong University of Science & Technology (No. IORG0003571). All participants were informed of the study's purpose and risks, and by voluntarily completing the questionnaire, they provided implied consent. Given the anonymous nature of the survey, written consent was not required.

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Data available statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

CRedit authorship contribution statement

Sha Liu: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation. **Yinhuan Hu:** Methodology, Funding acquisition, Conceptualization. **Holger Pfaff:** Conceptualization. **Xiandong Feng:** Writing – original draft. **Jinzhui Xie:** Investigation, Data curation. **Zemiao Zhang:** Investigation, Data curation. **Dehe Li:** Investigation, Data curation.

Declaration of competing interest

All the authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2024.e37766>.

References

- [1] H.J. Kang, S. Yu, Nurses' perspectives of the patient care experience assessment items using importance-performance analysis, *J. Nurs. Manag.* 30 (7) (2022) 3247–3255.
- [2] P.D. Cleary, Evolving concepts of patient-centered care and the assessment of patient care experiences: optimism and opposition, *Journal of health politics* 41 (4) (2016) 675–696, <https://doi.org/10.1215/03616878-3620881>.
- [3] J. Hanefeld, T. Powell-Jackson, D. Balabanova, Understanding and measuring quality of care: dealing with complexity, *Bull. World Health Organ.* 95 (5) (2017) 368–374.
- [4] Y. Bao, G. Fan, D. Zou, T. Wang, D. Xue, Patient experience with outpatient encounters at public hospitals in Shanghai: examining different aspects of physician services and implications of overcrowding, *PLoS One* 12 (2) (2017) e0171684.
- [5] H. Qian, G.B. Li, H.X. Chen, D.L. Zhang, An exploratory research of patient perceived value in China, *Journal of Medical Marketing* 11 (4) (2011) 277–283.
- [6] D.A. Fitriani, S.A. Pasinringi, I. Irwandy, H. Amqam, The effect of perceived value toward loyalty through patient satisfaction in Hasanuddin University Hospital, *Enfermería Clínica* 30 (2020) 408–411.
- [7] S.S. Ali, A. Basu, N. Ware, Quality measurement of Indian commercial hospitals—using a SERVQUAL framework, *Benchmarking: An International Journal*, Emerald Publishing Limited 25 (3) (2018) 815–837.
- [8] H.A. Gorji, S. Tabatabaei, A. Akbari, S. Sarkhosh, Khorasan Sijoha, Using the service quality gap's model (SERVQUAL) in Imam Khomeini teaching hospital, *Journal of Health Administration* 16 (51) (2013) 7–18.
- [9] A. A'aqoulah, A.B. Kuyini, S. Albalas, Exploring the Gap between Patients' Expectations and Perceptions of Healthcare Service Quality, *Patient preference adherence.*, 2022, pp. 1295–1305.
- [10] A. Jonkisz, P. Karniej, D. Krasowska, The servqual method as an assessment tool of the quality of medical services in selected asian countries, *Int. J. Environ. Res. Publ. Health* 19 (13) (2022) 7831.
- [11] B. Angelova, J. Zekiri, Measuring customer satisfaction with service quality using American Customer Satisfaction Model (ACSI Model), *Int. J. Acad. Res. Bus. Soc. Sci.* 1 (3) (2011) 232–258.
- [12] A. Parasuraman, V.A. Zeithaml, L.L. Berry, A conceptual model of service quality and its implications for future research, *J. Market.* 49 (4) (1985) 41–50.
- [13] S.S. Ali, R. Bharadwaj, F. Ahmad, Flexible approach to patients satisfaction: a case of Indian private hospitals, *Int. J. Serv. Oper. Manag.* 14 (2) (2013) 252–275.
- [14] A. Nadi, J. Shojaee, G. Abedi, H. Siamian, E. Abedini, F. Rostami, Patients' expectations and perceptions of service quality in the selected hospitals, *Med. Arch.* 70 (2) (2016 Apr) 135–139, <https://doi.org/10.5455/medarh.2016.70.135-139>.
- [15] M. Nekoei-Moghadam, M. Amiresmaili, Hospital services quality assessment: hospitals of Kerman University of Medical Sciences, as a tangible example of a developing country, *Int. J. Health Care Qual. Assur.* 24 (1) (2011).
- [16] F. AlOmari, Measuring gaps in healthcare quality using SERVQUAL model: challenges and opportunities in developing countries, *Measuring Business Excellence* 25 (4) (2021) 407–420.
- [17] F. Buttle, SERVQUAL: review, critique, research agenda, *Eur. J. Market.* 30 (1) (1996) 8–32.
- [18] H. Rahmani, R. Maleki, M.K. Ghanbari, M. Behzadifar, Quality assessment of services in primary healthcare in Iran: a systematic review and meta-analysis, *Ethiopian journal of health sciences* 32 (2) (2022) 453–462.
- [19] K.J. Al Fraihi, S.A. Latif, Evaluation of outpatient service quality in Eastern Saudi Arabia. Patient's expectations and perceptions, *Saudi Med. J.* 37 (2016) 420–428.
- [20] M. Pekmaya, Ö. Pulat İmamoglu, H. Koca, Evaluation of healthcare service quality via Servqual scale: an application on a hospital, *Int. J. Healthc. Manag.* 12 (4) (2019) 340–347.
- [21] S.-J. Lu, H.-O. Kao, B.-L. Chang, S.-I. Gong, S.-M. Liu, S.-C. Ku, et al., Identification of quality gaps in healthcare services using the SERVQUAL instrument and importance-performance analysis in medical intensive care: a prospective study at a medical center in Taiwan, *BMC Health Serv. Res.* 20 (1) (2020) 1–11.
- [22] Q. Lin, H.-S. Hao, D. Zhang, Assessing quality gap of outpatient service in public hospitals: a cross-sectional study in China, *Inquiry: The Journal of Health Care Organization, Provision, Financing.* 60 (2023), 469580231162527.
- [23] Y. Li, W. Gong, X. Kong, O. Mueller, G. Lu, Factors associated with outpatient satisfaction in tertiary hospitals in China: a systematic review, *Int. J. Environ. Res. Publ. Health* 17 (19) (2020) 7070.
- [24] P.L. Hudak, S. Hogg-Johnson, C. Bombardier, P.D. McKeever, J.G. Wright, Testing a new theory of patient satisfaction with treatment outcome, *J Medical care* (2004) 726–739.
- [25] A.L. Stanton, M.A. Estes, N.C. Estes, C.L. Cameron, S. Danoff-Burg, L.M. Irving, Treatment decision making and adjustment to breast cancer: a longitudinal study, *J. Consult. Clin. Psychol.* 66 (2) (1998) 313.
- [26] S. Liu, Y. Hu, C. Lu, D. Li, Z. Zhang, Identifying patient perceived values during outpatient encounters: an empirical study from Chinese public hospitals, *BMC Health Serv. Res.* 23 (2023) 852.
- [27] A. Izadi, Y. Jahani, S. Rafiei, A. Masoud, L. Vali, Evaluating health service quality: using importance performance analysis, *Int. J. Health Care Qual. Assur.* 30 (7) (2017) 656–663.
- [28] S.J. Tabibi, M.R. Gohari, S. Shahri, S. Aghababa, Assessment of health care services in outpatient clinics based on SERVQUAL model in hospitals of Tehran, *Payavard Salamat* 5 (4) (2012) 49–56.
- [29] S. Behdioglu, E. Acar, H.A. Burhan, Evaluating service quality by fuzzy SERVQUAL: a case study in a physiotherapy and rehabilitation hospital, *Total Qual. Manag. Bus. Excel.* 30 (3–4) (2019) 301–319.
- [30] W. Ren, L. Sun, C.S. Tarimo, Q. Li, J. Wu, The situation and influencing factors of outpatient satisfaction in large hospitals: evidence from Henan province, China, *BMC Health Serv. Res.* 21 (1) (2021) 500.
- [31] M.A. Abbasi-Moghaddam, E. Zarei, R. Bagherzadeh, H. Dargahi, P. Farrokhi, Evaluation of service quality from patients' viewpoint, *BMC Health Serv. Res.* 19 (1) (2019) 170.
- [32] P. Farrokhi, A. Aryankhesal, R. Bagherzadeh, A. Aghaei Hashjin, Evaluation of outpatient service quality: what do patients and providers think? *Int. J. Healthc. Manag.* 16 (3) (2023) 394–403.
- [33] P. Farrokhi, R. Bagherzadeh, M. Arab-Zozani, E. Zarei, Assessing the quality of hospital outpatient services in Iran: a systematic review and meta-analysis, *BMC Health Serv. Res.* 23 (1) (2023) 508.
- [34] D. Roberge, D. Tremblay, M.-É. Turgeon, D. Berbiche, Patients' and professionals' evaluations of quality of care in oncology outpatient clinics, *Support. Care Cancer* 21 (2013) 2983–2990.
- [35] S. Marzban, M. Najafi, M. Etedal, S. Moradi, Rajae RjeOB, The evaluation of outpatient quality services in physiotherapy in the teaching health centers of Shahid Beheshti University based on SERVQUAL tools, *European Journal of Biology and Medical Science Research* 3 (3) (2015) 46–53.
- [36] M. Qolipour, A. Torabipour, F.F. Khiavi, A.S. Malehi, Assessing medical tourism services quality using SERVQUAL model: a patient's perspective, *Iran. J. Public Health* 47 (1) (2018) 103.

- [37] I. Fatima, A. Humayun, U. Iqbal, M. Shafiq, Dimensions of service quality in healthcare: a systematic review of literature, *Int. J. Qual. Health Care* 31 (1) (2019) 11–29.
- [38] A.B. Zun, M.I. Ibrahim, A.A. Hamid, Level of satisfaction on service quality dimensions based on SERVQUAL model among patients attending 1 Malaysia clinic in Kota Bharu, Malaysia, *Oman Med. J.* 33 (5) (2018) 416.
- [39] E. Zarei, A. Daneshkohan, R. Khabiri, M. Arab, The effect of hospital service quality on patient's trust, *Iran. Red Crescent Med. J.* 17 (1) (2015).
- [40] A.N. Mason, The most important telemedicine patient satisfaction dimension: patient-centered care, *Telemedicine and e-Health*. 28 (8) (2022) 1206–1214.
- [41] E. Zarei, Service quality of hospital outpatient departments: patients' perspective, *Int. J. Health Care Qual. Assur.* 28 (8) (2015) 778–790.
- [42] E. Batbaatar, J. Dorjdagva, A. Luvsannyam, M.M. Savino, P. Amenta, Determinants of patient satisfaction: a systematic review, *Perspectives in public health* 137 (2) (2017) 89–101.
- [43] I. Fatima, A. Humayun, M.I. Anwar, A. Iftikhar, M. Aslam, M. Shafiq, How do patients perceive and expect quality of surgery, diagnostics, and emergency services in tertiary care hospitals? An evidence of gap analysis from Pakistan, *Oman Med. J.* 32 (4) (2017) 297.
- [44] R.R. Marzo, S. Bhattacharya, N.B. Ujang, T.W. Naing, A.T. Huong Fei, C.K. Chun, et al., The impact of service quality provided by health-care centers and physicians on patient satisfaction, *J. Educ. Health Promot.* 10 (2021) 160.
- [45] R.K. Alhassan, S.O. Duku, W. Janssens, E. Nketiah-Amponsah, N. Spieker, P. van Ostenberg, et al., Comparison of perceived and technical healthcare quality in primary health facilities: implications for a sustainable national health insurance scheme in Ghana, *PLoS One* 10 (2015) e0140109.
- [46] B.B. Poksinska, M. Fialkowska-Filipek, J. Engström, Does Lean healthcare improve patient satisfaction? A mixed-method investigation into primary care, *BMJ Qual. Saf.* 26 (2016) 95–103.