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ORIGINAL RESEARCH

Evaluation of Needs for Chronic Disease Management Services in Patients with Inflammatory Bowel Disease Based on the Kano Model: A Cross-Sectional Study

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Purpose: To investigate and analyze the needs for chronic disease management services among patients with inflammatory bowel disease (IBD) and provide recommendations for service optimization.

Patients and Methods: A Kano model-based questionnaire on chronic disease management service needs was developed through preliminary research. Using a convenience sampling method, 240 IBD patients were recruited for a cross-sectional survey between July 2024 and November 2024. The Kano model was applied to categorize service needs according to distinct attributes.

Results: Among the 32 demand items, Kano attribute categorization (based on frequency distribution of paired responses) revealed 16 one-dimensional attributes, 15 attractive attributes, and 1 indifferent attribute No must-be or reverse attributes were identified. Satisfaction (Better) and importance (Worse) coefficients were calculated for each item, followed by matrix quadrant analysis using the mean Better (0.7204) and mean Worse (0.3936) as cutoffs. This analysis placed 14 items in the competitive advantage area (eg, Hands-on Training for Medication Use), 4 items in the improvement priority area (eg, Access to a Designated IBD Nurse Liaison), 10 items in the secondary improvement area (eg, Creation of Personal Health Records), and 4 items in the maintenance area (eg, Early Detection of Osteoporosis).

Conclusion: This exploratory cross-sectional Kano study found that the chronic disease management needs of IBD patients were mainly one-dimensional and attractive attributes. These findings offer a preliminary framework for prioritizing service delivery and allocating resources accordingly, with Quadrant I (competitive advantage area) and Quadrant II (improvement priority area) guiding immediate attention.

Keywords: inflammatory bowel disease, chronic disease management, needs, Kano model, quality care services, patient preference

Introduction

Inflammatory bowel disease (IBD), encompassing ulcerative colitis (UC) and Crohn's disease (CD), represents a group of chronic, relapsing inflammatory disorders of the gastrointestinal tract with elusive etiology. In the past 30 years, IBD has changed from a traditional 'western disease to a truly global disease. It is expected that the total number of IBD patients in Asia will exceed 4 million by 2035.[1] The disease is characterized by complex symptoms and potentially severe complications, exerting sustained negative impacts on patients physical and psychological well-being as well as social

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functioning. Furthermore, insufficient disease awareness and suboptimal treatment adherence among patients often contribute to unfavorable prognoses, underscoring the critical importance of comprehensive and long-term disease management strategies.

However, IBD chronic disease management involves a wide range of services. Against the backdrop of limited management resources, providing high-quality services to patients not only poses significant challenges but also becomes particularly crucial. Therefore, clarifying the hierarchical structure of patients' needs in chronic disease management is essential. This clarification serves as a key prerequisite to optimize service delivery, enhance management outcomes, and improve patient satisfaction.

Chronic noncommunicable diseases (NCDs), also referred to as chronic diseases, are characterized by an insidious onset, prolonged duration, and persistent progression. Major categories of NCDs include cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes, which collectively account for over 80% of all premature mortality attributable to noncommunicable diseases globally.[2] In recent years, the sustained rise in the global incidence of NCDs has rendered their effective management a critical public health challenge.[3] Chronic disease management encompasses systematic and continuous processes of detection, monitoring, assessment, and comprehensive intervention targeting both the diseases and their risk factor. Such management supports patients in better coping with the physical, psychological, and social impacts of their conditions, thereby improving quality of life and reducing the inefficient use of healthcare resources.[4] Consequently, it plays an indispensable role in contemporary healthcare systems. Currently, the spectrum of conditions considered under the umbrella of chronic diseases has expanded to include a variety of disorders such as gastrointestinal diseases, renal diseases, dermatological conditions, and mental health disorders.

The global prevalence of IIBD has been steadily increasing.[5] In China, its prevalence has risen markedly, transitioning from a rare condition to a common disease.[6] IBD patients frequently experience symptoms such as diarrhea and abdominal pain, which not only disrupt daily activities but may also lead to reduced oral intake and malabsorption, resulting in malnutrition.[7] Owing to the chronic and relapsing nature of the disease, IBD is also associated with negative psychological outcomes, including depression and anxiety.[8] Furthermore, it may give rise to extraintestinal manifestations or increase the risk of malignancy in affected intestinal segments.[9] These factors collectively contribute to a diminished quality of life for individuals with IBD,[10] imposing a substantial burden on patients and their families and emerging as a major public health challenge.[11]

Currently, IBD cannot be cured and patients need lifelong chronic disease management. Chronic disease management is an indispensable part of the comprehensive treatment for IBD and can reduce inflammation levels, prevent disease deterioration or slow down the disease progression, and improve the quality of life. Patients are the direct bearers of the disease and understanding their needs for chronic disease management is conducive to enhancing their compliance with chronic disease management and improving the effectiveness of chronic disease management.[12] Currently, IBD patients have diverse needs for chronic disease management, and their needs have expanded from traditional symptom control to multiple dimensions such as psychological intervention and nutritional support. Given the complexity of the condition, IBD patients face diverse needs that need to be met urgently. However, the cognitive level of Chinese IBD patients regarding chronic disease management is low and their treatment compliance is not high.[13] Therefore, it is crucial to clearly define the levels of patients' chronic disease management needs in order to optimize services and improve management effectiveness and satisfaction.

The validated QUOTE-IBD and CACHE instruments are used to investigate healthcare quality perception and satisfaction levels among IBD patients, respectively.[14,15] Notably, both tools are based on a linear assumption, measuring service performance along a continuous scale of satisfaction. As such, they cannot be directly applied to resource allocation or priority-setting strategies—for example, determining which service attributes, if improved, would yield the greatest increase in satisfaction under resource-constrained conditions. To address this limitation, we adopted the Kano model, which overcomes the above shortcomings.

The Kano model, developed by Professor Noriaki Kano, is a methodological framework for classifying and prioritizing user needs, aimed at discriminating types of requirements to enhance user satisfaction under constrained resources.[16] According to the Kano model, service attributes are categorized into five distinct type: (1) Must-be Quality (M): Fulfillment of this attribute does not increase user satisfaction; however, its absence leads to significant dissatisfaction.(2) One-

dimensional Quality (O): Satisfaction increases when this attribute is provided and decreases when it is absent.(3) Attractive Quality (A): Absence of this attribute does not cause dissatisfaction, but its presence considerably enhances user satisfaction and loyalty.(4) Indifferent Quality (I): User satisfaction remains unaffected regardless of whether this attribute is provided or not.(5) Reverse Quality (R): Users do not require this attribute and may even express aversion toward it.[17]

Historically, the Kano model has been extensively applied within the service industry.[18–20] It was first introduced into the healthcare sector in 2003[21] and has since been widely adopted by healthcare institutions to identify patient needs and improve the quality of medical care.[22,23] However, existing studies have primarily focused on the needs of specific patient groups, such as cancer patients,[24] day surgery patients,[25] and emergency observation patients,[26] with scant research addressing the needs of individuals with IBD. Therefore, this study employs the Kano model to categorize and define the attributes of chronic disease management service needs among IBD patients, thereby identifying their core demands. The ultimate aim is to facilitate the development of tailored chronic disease management services and enhance satisfaction levels in this patient population.

Materials and Methods

Study Design and Ethical Considerations

The study employed a pragmatic cross-sectional design and was registered in the National Medical Research Registration System (registration number: MR-44-24-015919). Ethical approval was obtained from the Ethics Committee of the Second Affiliated Hospital of Guangzhou University of Chinese Medicine (Guangdong Provincial Hospital of Chinese Medicine) (approval number: YM2023-287). All procedures of this study were in accordance with the ethical standards of the institutional research committee and the Helsinki Declaration. Written informed consent was obtained from all participants or their legal guardians prior to data collection.

Participants and Procedures

This study employed a convenience sampling method between July and November 2024. Participants were recruited from IBD patients attending either the inpatient department or the specialized IBD outpatient clinic within the chronic disease management center at a tertiary care hospital in Guangzhou, China. Additionally, the sample comprised nationally distributed IBD patients who were managed and served by a specific IBD volunteer service organization in China.

The inclusion criteria for IBD patients included: (1) a confirmed diagnosis of Crohn's disease or ulcerative colitis; (2) age≥18 years; (3) being mentally lucid, capable of comprehending the questionnaire content, and able to complete the electronic survey; and (4) provision of informed consent. Exclusion Criteria: Individuals were not included from the study if they: (1) had been diagnosed for less than 3 months; (2) were critically ill and unable to cooperate with the study procedures. The study identified a total of 32 indicators for IBD chronic disease management services. The sample size was determined based on the requirement of 5 to 10 times the number of these variables. Accounting for a potential 20% rate of invalid responses, a minimum sample size of 200 participants was calculated for this study.

Research Tools

The data collection comprised two main instruments: (1) General Information Questionnaire: This component gathered demographic and clinical characteristics, including gender, age, educational level, occupation, mode of medical payment, disease duration, and marital status. (2) IBD Chronic Disease Management Service Needs Questionnaire Based on the Kano Model: Developed in accordance with the Kano model framework, the questionnaire was constructed based on a previously established service content framework for IBD chronic disease management. This framework—derived from literature review, qualitative interviews, and expert consultation—encompasses four dimensions (Environmental Domain, Psychosocial Domain, Physiological Domain, and Health-related Behaviors Domain) and comprises 32 service requirements. For each service requirement, two questions were asked: a positive question ("If this service were provided, how would you feel?") and a negative question ("If this service were not provided, how would you feel?"). The questionnaire demonstrated high internal consistency, with Cronbach's α values of 0.955 for the positive question, 0.973 for the negative question, and an overall Cronbach's α of 0.981. All values exceeded the recommended threshold of 0.700, indicating satisfactory reliability.

Kano Model Analysis Method

For each service requirement, the Kano model employs a dual-question framework comprising both a functional and a dysfunctional question. Respondents answer both questions using a symmetric five-level scale: "I like it that way," "It must be that way," "I am neutral," "I can live with it that way," and "I dislike it that way". The paired responses are then mapped to a predefined Kano evaluation table (Table 1) to determine the initial attribute classification for each requirement. The final categorization of each service requirement is assigned according to the most frequently occurring attribute in the statistical distribution. In instances where the highest frequency is shared by two attributes, a predefined priority rule (M > O > A > I) is applied to resolve the tie and determine the definitive attribute classification.

To quantitatively differentiate the impact of individual service requirements within the same attribute category on user satisfaction, the Kano analysis was supplemented by calculating both the satisfaction index(SI) and the dissatisfaction index(DSI). The satisfaction index is represented by the Better/SI value, while the dissatisfaction index is defined by the Worse/DSI value. These coefficients are calculated using the following formulas: Better = (A + O) / (A + O + M + I); Worse = (M + O) / (A + O + M + I). The closer the Better/SI value is to 1, the greater the impact of that factor on patient satisfaction. The closer the Worse/DSI value is to 1, the more important the item is considered by patients. Based on the calculated Better and Worse value, a scatter plot was constructed using the average values of these coefficients as the central axes. This matrix delineates four distinct quadrants: Quadrant I (Competitive Advantage Area), Quadrant II (Improvement Priority Area), Quadrant III (Secondary Improvement Area), and Quadrant IV (Maintenance Area).

Data Collection

The survey was administered using the web-based platform SoJump (https://www.wjx.cn/login.aspx). To prevent duplicate submissions, the questionnaire settings were configured to restrict access to WeChat users only, with each WeChat account permitted to complete the survey only once. Prior to participation, the research purpose, methodology, and significance were explained to eligible IBD patients. After obtaining informed consent, participants were instructed to scan a Quick Response (QR) code using the WeChat application on their mobile devices to access the electronic questionnaire. Before starting the survey, a researcher provided standardized instructions regarding the completion method and item interpretation. Participants then proceeded to self-administer the questionnaire.

Quality Control

To ensure data integrity, all items in the SoJump were set as "required," guaranteeing complete responses from all participants. Following data export, two researchers independently screened the questionnaires in Excel to identify and exclude invalid entries. Invalid questionnaires were defined as those with a completion time of less than 200 seconds, those in which all items were assigned the same response option, or those containing logically problematic answers exceeding 50% of the total items.

Table 1 Kano Estimation Table

Functional Question (e.g, If This Service Were Provided, How Do You Feel?)	**Dysfunctional Question (e.g, If This Service Were Not Provided, How Do You Feel?)**				
	I Like It That Way	**It Must Be That Way**	**I Am Neutral**	**I Can Live with It That Way**	**I Dislike It That Way**
I like it that way	Q	A	A	A	O
It must be that way	R	I	I	I	M
I am neutral	R	I	I	I	M
I can live with it that way	R	I	I	I	M
I dislike it that way	R	R	R	R	Q

Abbreviations: Q, questionable results, means this questionnaire is invalid; A, attractive attribute; O, one-dimensional attribute; R, reverse attribute; I, indifferent attribute; M, must-be attribute.

Statistical Analysis

Data analysis was performed using SPSS Statistics version 26. Categorical variables were described using frequencies and percentages, while continuous variables were summarized as mean ± standard deviation. The classification of attributes was conducted in accordance with the standard Kano model methodology. Subsequently, the satisfaction and importance coefficients for each service requirement were calculated.

Validity and Reliability

We used the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) checklist for observational studies to strengthen reporting of the results.

Results

Participants

A total of 263 questionnaires were collected in this study. After excluding 23 invalid questionnaires, 240 IBD patients were included, with an effective rate of 91.25%. The age ranged from 18 to 81 (33.41 ± 11.45) years, and the disease duration was 0.5 to 30.0 (4.59 ± 4.23) years. The other data are shown in Table 2.

The Kano Attribute Results of the Chronic Disease Management Service Needs of Patients with Inflammatory Bowel Disease

Among the 32 chronic disease management service requirements evaluated, the One-dimensional Quality category accounted for the largest proportion (16 items, 50.00%), followed by Attractive Quality (15 items, 46.88%). Only one

Table 2 General Information of Participants

Variables	Frequency (n)	Percentage (%)
Gender		
Male	163	67.92
Female	77	32.08
Types of IBD		
Crohn's disease	174	72.50
Ulcerative colitis	66	27.50
Educational level		
Primary school and below	5	2.08
Middle School	66	27.50
Junior College/Bachelor's Degree	154	64.17
Master's degree or above	15	6.25
Occupation		
Employed	175	72.92
Student	34	14.17
Unemployed/Retired	31	12.92
Marital status		
Married	120	50.00
Single	113	47.08
Divorced	6	2.50
Widowed	1	0.42
Medical expense methods		
Employee medical insurance	163	67.92
Resident medical insurance	68	28.33
Public medical insurance	3	1.25
Self-funded	4	1.67
Commercial Insurance	2	0.83

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item was classified as Indifferent Quality (3.13%). Notably, no items were identified as Must-be Quality or Reverse Quality. The detailed classification results are presented in Table 3.

Results of the Better-Worse Matrix Analysis for Chronic Disease Management Needs in Patients with Inflammatory Bowel Disease

The Better and Worse coefficients for each service requirement are detailed in Table 3. The average Better value was calculated to be 0.7204, while the average Worse value was 0.3936. A Better-Worse matrix scatter plot was subsequently constructed based on these values (Figure 1). The chronic disease management service requirements for IBD patients were categorized into four distinct quadrants of the matrix: Quadrant I (Competitive Advantage Area) contained 14 items (43.75%), specifically items 4, 5, 9, 10, 13, 14, 15, 18, 20, 21, 22, 23, 24, and 30. Quadrant II (Improvement Priority Area) included 4 items (12.50%): items 3, 8, 12, and 29. Quadrant III (Secondary Improvement Area) comprised 10 items (31.25%): items 1, 2, 6, 7, 11, 19, 25, 26, 27, and 28. Finally, Quadrant IV (Maintenance Area) contained 4 items (12.50%): items 16, 17, 31, and 32. The complete list of services corresponding to each quadrant is provided in Table 4.

Table 3 The Kano Attribute Results of Chronic Disease Management Service Demands for Patients with IBD

Service Item	Frequency						Kano Category	Better	Worse
	A	I	M	O	R	Q			
1.Creation of Personal Health Records	86	90	23	39	2	0	I	0.525	0.261
2.Improvement of Facilities and Resources in Chronic Disease Management Sites	113	63	9	53	1	1	A	0.697	0.261
3.Telemedicine Services	113	33	13	79	0	2	A	0.807	0.387
4.Professional Medical Support	98	27	12	100	1	2	O	0.835	0.473
5.Optimize the Patient Experience	105	23	10	101	0	1	A	0.862	0.464
6.Assessment of Anxiety and Depression	95	93	11	38	3	0	A	0.561	0.207
7.Psychological Counseling and Support	101	82	10	44	3	0	A	0.612	0.228
8.Access to a Designated IBD Nurse Liaison	104	57	9	69	1	0	A	0.724	0.326
9.Collaborative Development of Treatment Decisions	84	48	15	91	1	1	O	0.735	0.445
10.Respect for Patient Dignity and Rights	59	30	24	126	0	1	O	0.774	0.628
11.Strengthening Patient Support Networks	100	85	10	37	1	7	A	0.591	0.203
12.Material and Financial Assistance	130	57	4	47	1	1	A	0.744	0.214
13.Symptom Management	92	33	16	97	1	1	O	0.794	0.475
14.Prevention and Management of Complications	77	31	19	111	1	1	O	0.790	0.546
15.Fistula Management and Stoma Care	61	43	17	115	2	2	O	0.746	0.559
16.Incontinence Management	64	53	17	103	2	1	O	0.705	0.506
17.IBD-Focused Preconception and Pregnancy Guidance	70	59	13	95	1	2	O	0.696	0.456
18.Explanation of Medical Condition to Patients	82	32	25	99	2	0	O	0.761	0.521
19.Disease-Specific Health Education	98	64	11	66	1	0	A	0.686	0.322
20.Biologics Therapy Management	66	40	16	118	0	0	O	0.767	0.558
21.Management of Non-biologic Therapies	73	46	16	104	1	0	O	0.741	0.502
22.Hands-on Training for Medication Use	73	53	14	100	0	0	O	0.721	0.475
23.Nutritional Care	99	37	9	94	0	1	A	0.808	0.431
24.Hands-on Training for Enteral Nutrition Techniques	84	42	16	96	0	2	O	0.756	0.471
25.Health Care Oversight	98	71	5	65	1	0	A	0.682	0.293
26.Regular Follow-up	103	67	9	60	0	1	A	0.682	0.289
27.Application of Appropriate Traditional Chinese Medicine Techniques	106	63	5	60	6	0	A	0.709	0.278
28.Lifestyle Counseling	104	70	5	60	0	1	A	0.686	0.272
29.Exercise Guidance	113	61	3	62	1	0	A	0.732	0.272
30.Vaccination Counseling	83	56	8	91	1	1	O	0.731	0.416
31.Cancer Screening Counseling	72	60	10	98	0	0	O	0.708	0.450
32.Early Detection of Osteoporosis	74	67	8	89	2	0	O	0.685	0.408

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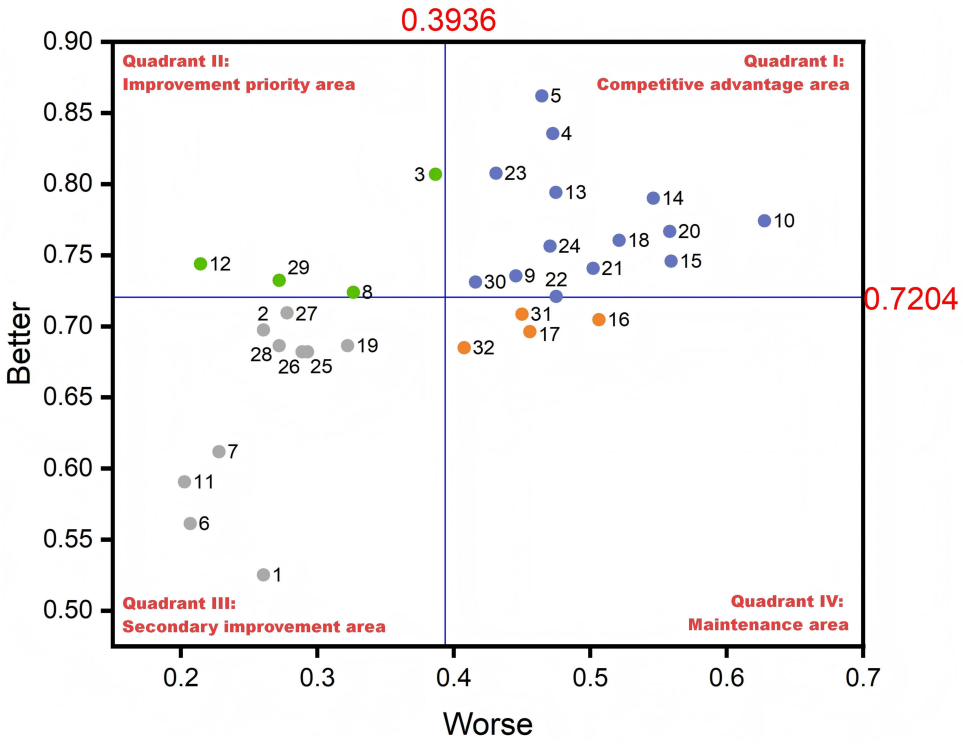

Figure 1 Better-Worse matrix of chronic disease management service needs in patients with inflammatory bowel disease.
Notes: The horizontal axis represents the Worse coefficient (importance), and the vertical axis represents the Better coefficient (satisfaction). The blue lines indicate the mean values (Better = 0.7204, Worse = 0.3936).

Discussion

The Kano Model is Feasible for Analyzing the Service Demand for Chronic Disease Management of Patients with Inflammatory Bowel Disease

Current research on chronic disease management for patients with IBD, both domestically and internationally, has primarily focused on clinical management of pharmacotherapy,[27] dietary interventions,[28] and assessment and

Table 4 Distribution of the 32 Service Items Across the Four Quadrants of the Better-Worse Matrix

Quadrant II – Improvement Priority Area	Quadrant I – Competitive Advantage Area
Item 3: Telemedicine services Item 8: Access to a designated IBD nurse liaison Item 12: Material and financial assistance Item 29: Exercise guidance	Item 4: Professional medical support Item 5: Optimize the patient experience Item 9: Collaborative development of treatment decisions Item 10: Respect for patient dignity and rights Item 13: Symptom management Item 14: Prevention and management of complications Item 15: Fistula management and stoma care Item 18: Explanation of medical condition to patients Item 20: Biologics therapy management Item 21: Management of non-biologic therapies Item 22: Hands-on training for medication use Item 23: Nutritional care Item 24: Hands-on training for enteral nutrition techniques Item 30: Vaccination counseling

(*Continued*)

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Table 4 (Continued).

Quadrant II – Improvement Priority Area	Quadrant I – Competitive Advantage Area
Quadrant III – Secondary Improvement Area	**Quadrant IV – Maintenance Area**
Item 1: Creation of personal health records	Item 16: Incontinence management
Item 2: Improvement of facilities and resources in chronic disease management sites	Item 17: IBD-focused preconception and pregnancy guidance
Item 6: Assessment of anxiety and depression	Item 31: Cancer screening counseling
Item 7: Psychological counseling and support	Item 32: Early detection of osteoporosis
Item 11: Strengthening patient support networks	
Item 19: Disease-specific health education	
Item 25: Health care oversight	
Item 26: Regular follow-up	
Item 27: Application of appropriate traditional Chinese medicine techniques	
Item 28: Lifestyle counseling	

management of mental health status.[29] At present, there is still a lack of systematic assessment of the comprehensive chronic disease management service needs of IBD patients, making it difficult to fully meet their long-term and multi-dimensional health management needs. The Kano model, as an important tool for identifying service demand attributes and optimizing nursing quality, has been widely applied in the medical field in recent years. It not only helps with demand analysis but also promotes continuous improvement of service quality. Given the long-term and complex nature of IBD's chronic disease management, there is an urgent need for comprehensive and scientific management strategies as support. Studies have shown that IBD patients still have certain dissatisfaction with chronic disease management-related services.[30] In addition, the diverse types of management services, the strong heterogeneity of the patient population, and the limited medical resources all require an effective method to prioritize service items. Therefore, analyzing the chronic disease management needs of IBD patients using the Kano model can identify the services that patients are most urgently in need of and those that can enhance satisfaction the most. This study uses the model to systematically divide the chronic disease management needs of IBD patients into essential attributes, expected attributes, and attractive attributes, thereby providing a basis for implementing targeted management strategies and helping to stabilize the patient's condition and further improve their quality of life. This research method not only has theoretical feasibility but also opens up new research directions for clinical practice.

Analysis of Kano Model Attributes for Chronic Disease Management Service Needs in Patients with Inflammatory Bowel Disease

One-Dimensional Quality

The present study revealed 16 one-dimensional quality attributes underlying chronic disease management for patients with IBD, covering professional medical support, symptom and complication management, medication and dietary skill training, stoma and incontinence care, as well as preventive health services. Improvement and optimization of these service dimensions may correlate with higher patient satisfaction, and could potentially contribute to better health-related quality of life. These domains therefore represent key care demands that may merit appropriate consideration in routine clinical practice.

IBD chronic disease management centers could refine their medical support systems and develop a continuous whole-course management model grounded in multidisciplinary teamwork. The multidisciplinary team may consist of gastroenterologists, colorectal surgeons, specialized IBD nurses, stoma therapists, pathologists, and nutritionists, to deliver continuous management and professional medical services for patients.[31] Within the framework of shared decision-making, individualized counseling could be adopted to inform patients and their families about disease progression and available therapeutic options, while fully respecting patient preferences. Meanwhile, the IBD Symptom Cluster Scale may be employed to achieve a comprehensive evaluation of patients' symptomatic status. For vulnerable subgroups including patients with stoma or incontinence conditions, targeted care guidance may involve stoma and perianal skin

care, instruction on incontinence product application, and pelvic floor rehabilitation training.[32] Given that many IBD patients tend to have concerns and anxiety over fertility issues and genetic risks, reproductive health management services may be considered. Relevant content may include preconception evaluation of fertility and genetic susceptibility; appropriate adjustment of medication regimens during the preconception and gestational periods to lower the potential side effects of medications on the fetus; provision of personalized suggestions regarding delivery modes; and lactation breastfeeding guidance based on medication safety profiles to mitigate possible impacts on newborns.[33] Pharmacotherapy remains a fundamental component in the clinical management of IBD, and standardized medication monitoring may facilitate sustained disease remission. For patients receiving biological agents, detailed interpretation of treatment protocols and potential adverse events could be offered, alongside reminders for therapeutic drug concentration monitoring and clinical efficacy assessment.[34]

For individuals treated with non-biologic agents, ongoing medication education may help enhance treatment adherence in chronic disease management. Patients could also be encouraged to voluntarily communicate treatment responses and adverse reactions to clinical staff, which may facilitate timely regimen modification. Moreover, educational approaches integrating lectures and hands-on workshops may enable patients to grasp essential skills, such as enteral nutrition implementation, standardized suppository application, and self-administered enema. In terms of preventive care, provision of vaccination consultation, malignancy screening, and osteoporosis assessment and intervention may be delivered in reference to existing clinical guidelines,[35] which may help lower the likelihood of disease progression and deterioration.

In summary, IBD chronic disease management institutions should prioritize investment in and optimization of the above-mentioned services.

Attractive Quality

The present study identified 15 attributes categorized as Attractive Quality within chronic disease management for patients with IBD. These attributes mainly include the improvement of facilities and resources at chronic disease management sites, telemedicine resources, psychological support, social and family support, dietary guidance, and other health-promoting services. These services may be associated with satisfaction levels among IBD patients, serving as delightful attributes that could potentially enhance patient satisfaction when adequately provided.

The IBD chronic disease management centers might explore opportunities to improve patient experience and satisfaction through potential optimization of service environments and processes, enhancement of psychosocial support systems, and diversification of health support modalities.

Improve the spatial functional zoning of the IBD chronic disease management center, establish IBD treatment areas equipped with comfortable waiting areas, consultation rooms and health education zones, to improve the medical environment for patients. At the same time, the chronic disease management center should actively promote digital transformation, provide online medical services for stable IBD patients, establish an internet hospital, and improve convenient services such as remote medical consultation, mobile payment, and drug delivery,[36,37] reduce the various costs of patients' offline medical visits, and simplify the daytime biologic therapy treatment process, thereby optimizing the medical experience. In addition, regular mental health screenings and emotional intervention might be implemented to help IBD patients alleviate negative emotions.[38] When appropriate, patients could be referred to psychological experts for counseling to help prevent symptom exacerbation. The establishment of a liaison officer within IBD centers might facilitate timely communication with patients, enabling a better understanding of their needs and difficulties and ensuring that patients have access to necessary support.[39] Furthermore, patient support groups and charitable organizations could be utilized to provide assistance, which may help build diversified social support networks.

IBD management centers may also disseminate relevant knowledge through multiple online and offline channels, develop personalized follow-up plans for patients, and conduct regular assessments of disease status via telephone and text messages. Meanwhile, strengthened multidisciplinary collaboration among gastroenterologists, nurses, and nutritionists might support patients in making decisions regarding oral nutritional supplements and provide nutritional care.[40] Nutritional education workshops could potentially further enhance patients' self-management capabilities. Moreover, appropriate Traditional Chinese Medicine techniques, such as acupuncture and moxibustion, may be explored as

complementary approaches to IBD treatment and health maintenance.[41] Additionally, advocating healthy lifestyles, including smoking cessation, alcohol moderation, regular daily routines, and adequate exercise, might contribute to the comprehensive improvement of quality of life for IBD patients.

In summary, the IBD chronic disease management institution can selectively pilot or launch the above-mentioned attractive services on the basis of fully meeting the expected attribute requirements, in order to shape the differentiated advantages of the service brand, promote the upgrade of the service system, and enhance the happiness and satisfaction of patients.

Indifferent Quality

The results of this study identified one attribute classified as Indifferent Quality within the chronic disease management services for IBD patients: the "Creation of Personal Health Records". Although such services have minimal impact on patient satisfaction and their provision does not significantly alter the healthcare experience, the development of IBD health management records still carries substantial potential value.

Health management records are able to integrate comprehensive clinical information, including medical history and individual health data, which may help improve the precision of clinical care and facilitate more tailored decision-making for personalized health support. Analysis of information extracted from such records may enable clinicians to better understand the actual health status of IBD patients, conduct objective clinical assessments, and make corresponding optimized adjustments so as to better accommodate patients' demands in chronic disease management.

In this context, greater communication with IBD patients may be warranted, alongside appropriate health guidance regarding the significance and necessity of establishing personal health records, which could help patients recognize the long-term benefits of such records. Meanwhile, medical staff may collect patients' feedback and suggestions, allowing targeted refinement of the content and management mode of health records according to individual needs. Such efforts may help improve patients' acceptance and participation in health management initiatives.

Must-Be Quality

An unexpected but notable finding was the absence of any must-be attributes. This finding likely reflects the true characteristics of our study population and the specific healthcare context. Unlike elderly patients with common noncommunicable chronic diseases (eg, hypertension or diabetes), the majority of IBD patients were young to middle-aged adults (mean age 33.4 years) with a high educational level (70.42% had a junior college degree or above). This demographic profile suggests a more proactive, knowledgeable, and discerning patient group. They are less likely to regard any single service item as an absolute "must". Instead, they evaluate the overall quality and comprehensiveness of the service package. This cognitive pattern naturally suppresses the emergence of must-be attributes, which are more common in studies involving less-informed or more dependent patient populations. In addition, the structured and specialized chronic disease management for IBD is still an evolving field in China. Many of the 32 service items we investigated (eg, telemedicine, et al) are not yet established as universal standards of care From the patients' perspective, if a service is not yet a societal norm or an expected part of routine care, its absence will not trigger the strong negative response required. Therefore, the absence of must-be attributes indicates that providers of chronic disease management services should focus on outperforming in One-dimensional and Attractive attributes to maximize patient satisfaction.

The Better-Worse Matrix Analysis Has Clearly Defined the Priority Levels for Improving the Management Services of IBD

Quadrant I is competitive advantage area. This quadrant primarily includes medication management, symptom and complication management, and other services that significantly influence both satisfaction and importance among IBD patients. These services should be maintained and continuously optimized through routine quality improvement, with stable resource allocation.

Quadrant II is improvement priority area. Services in this quadrant, such as telemedicine, dedicated communication, exercise guidance, and social support, are associated with relatively high patient satisfaction but lower perceived importance. This suggests that patient awareness of these needs has not yet been fully realized. Therefore, healthcare

providers should actively explore patients' latent demands and enhance the perceived importance of these services through innovative delivery approaches. Collectively, the first two quadrants indicate that IBD patients have high expectations for both professional medical support and humanistic care. Service providers should continuously refine these aspects, prioritizing Quadrant I services while incrementally addressing those in Quadrant II to improve overall service quality.

Quadrant III is secondary improvement area. This category includes services such as disease knowledge education, health supervision, follow-up visits, and lifestyle guidance, which currently exhibit low impacts on both satisfaction and importance. These services have limited influence on patient satisfaction and may be scheduled for improvement only after core needs are met. They can be placed at the bottom for improvement. Therefore, under the condition of having sufficient manpower and complete other core services, relevant management plans can be gradually constructed as a secondary improvement direction.

Quadrant IV is maintenance area. Services in this quadrant—including incontinence management, reproductive and postpartum counseling, cancer screening guidance, and osteoporosis screening—significantly affect patient satisfaction if inadequately addressed. Their impact on importance and satisfaction is second only to Quadrant I services. This underscores patients' urgent need for higher-quality services in areas such as incontinence and reproductive health, while also highlighting the importance of increased attention to associated health risks such as cancer.

Limitations

Several limitations should be considered. First, the use of convenience sampling from a single tertiary hospital and an IBD volunteer organization may limit the representativeness of the sample. Patients from rural areas, those without access to specialized centers, or those with lower health literacy may have different needs. Future multi-center studies with stratified random sampling are warranted to enhance generalizability. Second, the study did not stratify patients according to disease stage or disease duration. Our participants' disease duration ranged from 6 months to 30 years, encompassing a broad spectrum from early-stage to very long-standing disease. Patients at different stages of disease progression or with different durations of illness may have different needs and priorities. Future research should adopt stratified sampling by stages or longitudinal designs to understand the evolution of patients' needs throughout the disease course.

Conclusion

In this exploratory cross-sectional study applying the Kano model, the chronic disease management service needs of patients with IBD were predominantly categorized as one-dimensional and attractive qualities, with only one indifferent attribute and no must-be or reverse qualities identified. This exploratory cross-sectional Kano study found that the chronic disease management needs of IBD patients were mainly one-dimensional and attractive attributes. These findings offer a preliminary framework for prioritizing service delivery and allocating resources accordingly, with Quadrant I (competitive advantage area) and Quadrant II (improvement priority area) guiding immediate attention. Finally, the interdisciplinary approach integrating nursing science and management principles offers a novel perspective that may inform further research into chronic disease management needs in other populations or healthcare contexts.

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Disclosure

All authors have no conflicts of interest for this work.

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