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Development and Validation of a Provider-Reported Instrument to Assess Chronic Healthcare Services in Saudi Arabia

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ABSTRACT

Background: Chronic diseases place a growing burden on healthcare systems globally, requiring coordinated, high-quality care, particularly in countries undergoing rapid reform. In Saudi Arabia, the ongoing health sector reforms highlight the urgent need to monitor and enhance chronic healthcare services at multiple system levels. However, no context-specific instrument currently exists to assess provider perspectives on chronic healthcare within the Saudi health system. This study aims to develop and validate a simplified, contextually relevant instrument to assess healthcare providers' perceptions of chronic healthcare services in Saudi Arabia.

Methods: This methodological study was conducted in 2025. The instrument was developed through literature review, expert consultation via a modified Delphi process, and psychometric evaluation. Data were collected from 254 healthcare providers across most regions of Saudi Arabia. Validity was examined using exploratory factor analysis (EFA), and reliability was assessed via Cronbach's alpha for internal consistency. All analyses were performed using SPSS version 18.

Results: The final instrument consisted of 34 items across seven dimensions: health system organization, community resource linkages, self-management support, decision support system, delivery system design, clinical information system, and workforce awareness of national transformation goals. The KMO and Cronbach's alpha index values were 0.91 and 0.95, indicating acceptable reliability and validity. The developed dimensions explained about 63.5% of the total variance.

Conclusion: This validated, context-specific instrument enables systematic assessment of provider perspectives on chronic healthcare services in Saudi Arabia. The inclusion of workforce awareness offers a novel dimension for evaluating alignment with national reform objectives. The tool is suitable for research, monitoring, and strategic planning, with potential adaptation to other settings following cross-cultural validation. Researchers are encouraged to test further and refine the tool to enhance its applicability as a standard measure for chronic care assessment.

Keywords: Chronic care; Instrument validation; Provider perception; Health system transformation; Saudi Arabia; Workforce awareness.

INTRODUCTION

Chronic diseases, defined as long-term health conditions that often progress slowly, limit daily activities, and require ongoing medical attention, have become a dominant global public health challenge. They account for the majority of deaths and healthcare expenditures worldwide and place a substantial burden on healthcare systems, necessitating coordinated, multi-dimensional care delivery strategies (1-6).

Several validated tools have been developed to assess the quality, accessibility, and effectiveness of chronic healthcare delivery. Among the most prominent are the Assessment of Chronic Illness Care (ACIC), which evaluates alignment with the Chronic Care Model (CCM) across six domains: health system organization, community resource linkages, self-management support, decision support system, delivery system design, and clinical information system.

Although the ACIC has demonstrated strong validity in various settings, adaptations in different countries have faced challenges in ensuring linguistic accuracy, cultural appropriateness, and structural alignment with local health systems, issues that can reduce both feasibility and validity (7-9). To address such issues, shorter, context-specific versions have been proposed to improve practicality in both clinical and research contexts (10).

In Saudi Arabia, demographic shifts, urbanization, and lifestyle-related risk factors have contributed to a rising chronic disease burden. The Health Sector Transformation Program (HSTP), launched under Vision 2030, aims to create an integrated, patient-centered, and value-based healthcare system (11-13). A key component of this transformation is the introduction of a chronic care pathway within the new Model of Care (MoC), targeting improvements in access, quality, efficiency, and preventive services (14). These reforms are intended to optimize health outcomes, resource utilization, and service delivery (15, 16).

Despite these initiatives, there is still no validated, context-specific tool that exists to assess chronic healthcare delivery in Saudi Arabia while reflecting the strategic priorities of the HSTP. Existing instruments, including the ACIC, face barriers of cultural fit, linguistic clarity, and operational feasibility in the Saudi context. Prior studies have also identified systemic gaps—such as limited provider awareness of national strategies and weak program integration—that are not adequately captured by current tools that are too lengthy for routine use (17, 18). These gaps limit the ability to generate data-driven improvements or to monitor progress toward national goals.

To address these gaps, this study aimed to develop and validate a simplified, streamlined, contextually relevant provider-reported instrument for assessing chronic healthcare services in Saudi Arabia. The tool is designed to align with the CCM dimensions and incorporates an additional dimension, workforce awareness of national transformation goals, reflecting the strategic emphasis of the HSTP.

MATERIALS & METHODS

Study design

This methodological study was conducted in Saudi Arabia in 2025 to design and validate a questionnaire for assessing chronic healthcare services.

Participants and the sampling method

A cross-sectional survey was administered to healthcare professionals across different Saudi regions and healthcare sectors. The study population included healthcare professionals, currently practicing in any sector or facility in Saudi Arabia, and involved in chronic healthcare delivery. Therefore, Healthcare providers who were not actively practicing or not engaged in chronic healthcare management within the Saudi healthcare system during the data collection period were excluded.

Non-probability convenience sampling was adopted. The questionnaire was distributed primarily via Google Forms via digital

platforms (WhatsApp, X, LinkedIn), with participants encouraged to forward the survey. Based on recommended ratios for factor analysis (5–10 participants per item), the study aimed to recruit 200–300 responses, ensuring demographic and regional diversity. Data were collected over four months (November 2024 – February 2025).

Developing the questionnaire

Within the CCM, the provider's perspective on chronic healthcare delivery is traditionally assessed using the ACIC instrument. The original ACIC comprises 28 indicators evaluated on a 12-point Likert scale (0–11), with aggregate scores grouped into four levels: D (limited, 0–2), C (basic, 3–5), B (reasonably good, 6–8), and A (fully developed, 9–11) (19). This instrument evaluates an organization's capacity to deliver structured chronic healthcare across six CCM dimensions.

To address contextual and practical limitations, several adaptations of the ACIC have emerged. For example, the ACIC-E adapted the tool for educational settings using a 4-point scale (20), and the ACIC-P modified the content for correctional health systems (21). The Questionnaire of Chronic Illness Care in Primary Care (QCPC), developed in Germany, retained CCM foundations but adopted a 5-point Likert scale with varied item formats to enhance usability (7). While these versions increased feasibility and contextual fit, they often shifted focus away from ACIC's original objective of comprehensively assessing system-level chronic healthcare delivery.

Given these limitations and the evolving Saudi healthcare context, this study developed a simplified and context-specific version of the ACIC. The revised tool retains the core CCM dimensions but adopts a 5-point Likert scale to enhance usability and clarity. Importantly, a seventh dimension—Workforce Awareness—was added to capture providers' understanding of national healthcare strategies, addressing a critical gap in existing tools and aligning the instrument with the goals of the HSTP.

Item Generation

The instrument was constructed based on the six core CCM dimensions outlined by Wagner et al. (1996), with items conceptually derived from 28 of the original ACIC indicators. Using a modified Delphi process, the item format was refined and adapted from the original 12-point scale to a single-level 5-point Likert scale.

To ensure alignment with the HSTP, a seventh dimension—Workforce Awareness of the National Programs—was introduced. This dimension emerged from both the literature review and expert feedback during the Delphi process, which emphasized the critical role of healthcare provider awareness, engagement, and implementation readiness in achieving national healthcare goals. The conceptual foundation for this dimension is supported by studies highlighting workforce awareness as a key enabler of health system reform (see Table 1 and 2).

Table 1: Workforce Awareness of a National Health Program (added dimension).

Dimension	*Sub Dimension*	*Reference*	*Supporting Note*
Knowledge and Training	Knowledge of Program Objectives	Grol and Wensing (2004) (22)	Highlights how evidence-based practice and awareness of barriers, such as poor knowledge and inadequate structures, are essential for engaging HCWs with national programs.
		Frenk et al. (2010) (23)	Stresses the alignment of transformative health education with national programs for effective chronic care management.
	Training and Education on the Program	WHO (2016) (24)	Emphasizes continuous professional development and strong HR strategies to support chronic disease care within national systems.

		Finis and Owen (2022) (25)	Focuses on workforce training and its role in improving compliance with health transformation guidelines.
Implementation and Collaboration	Implementation Knowledge	Levesque et al. (2013) (26)	Discusses how teamwork and understanding of processes improve chronic care outcomes and access to healthcare.
		Fixsen (2005) (27)	Underlines the importance of implementation science and structured processes for effective program adoption.
	Communication and Collaboration	Shahzad et al. (2019) (28)	Organizational culture, communication, and teamwork are essential for the implementation of national health strategies.
		Damschroder et al. (2009) (29)	Emphasizes shared responsibility, communication, and teamwork in health program success.
Evaluation and Attitudes	Attitudes and Perceptions of the Program	Greenhalgh et al. (2004) (30)	Supports the role of positive HCW attitudes and commitment in adopting national care initiatives.
		Barry et al. (2012) (31)	Demonstrates how shared decision-making fosters positive engagement and improves chronic care outcomes.
	Monitoring and Evaluation	Légaré et al. (2008) (32)	Shows how HCW attitudes, along with their knowledge of evaluation processes, influence the implementation of shared decision-making and overall program success.
		Proctor et al. (2011) (33)	Highlights the impact of healthcare worker perceptions on program evaluation and sustainability.

Table 2: Mapping of Dimensions to Supporting Literature for the Provider Instrument.

Dimension	***Assessment tool Reference***												
	Wagner et al. (1996)	Grol and Wensing (2004)	Frenk et al. (2010)	WHO (2016)	Finis and Owen (2022)	Levesque et al. (2013)	Fixsen (2005)	Shahzad et al. (2019)	Damschroder et al. (2009)	Légaré, Ratté (32)	Proctor et al. (2011)	Barry et al. (2012)	Greenhalgh et al. (2004)
Health Care Organization	+	+	+	+	+			+	+		+		+
Community Resources Linkages	+	+	+	+	+	+	+	+	+				+
Self-Management Support	+	+	+	+		+	+	+	+				+
Decision Support System	+	+	+	+	+		+	+	+	+	+		+
Delivery System Design	+	+	+	+	+		+	+	+				+
Clinical Information Systems	+	+	+	+	+			+	+				+
Workforce Awareness of a National Health Program		+	+	+	+	+	+	+	+	+	+	+	+

Content and face validity

To ensure cultural relevance and content validity of the newly developed instrument, a modified Delphi technique was employed. A panel of five experts, including clinicians, researchers, and public health professionals with substantial experience in chronic healthcare and healthcare reform, was purposefully selected. The process began with a comprehensive literature review to generate an initial pool of items. These items were then reviewed across multiple iterative rounds. Experts rated each item on a 4-point Likert scale in terms of relevance and clarity. After each round, responses were aggregated, and items lacking

consensus were revised or eliminated. Feedback was anonymized and shared with participants in subsequent rounds to promote convergence. This iterative process continued until all retained items achieved a minimum consensus score of 3 or higher, indicating agreement on their inclusion.

This iterative method ensured that the final instrument is both theoretically grounded and contextually appropriate, addressing known limitations of earlier tools and supporting more accurate evaluation of chronic healthcare delivery in alignment with the goals of the HSTP (17, 18, (34)). As for the content validity, the necessity of questions and their appropriate design were confirmed by using the content validity ratio (CVR) and the content validity index (CVI), respectively.

Construct validity

Construct validity was assessed through Exploratory Factor Analysis (EFA) to verify the instrument's underlying structure. It is a common technique utilized to retain the most critical factors and remove items with low correlation. Moreover, the scree plot was used to determine the number of factors in EFA. Items with factor loadings ≥ 0.30 were retained, while those below this threshold were reviewed for potential modification or removal, unless strong theoretical justification supported their inclusion (35).

Sampling adequacy for EFA was assessed using the Kaiser-Meyer-Olkin (KMO) values, which ranged from 0.7 to 0.79, considered middling, and 0.8 to 0.89, called meritorious (36). Bartlett's test of sphericity was used to evaluate whether the correlation matrix was suitable for factor analysis. This test examines the null hypothesis that the correlation matrix is an identity matrix. A significance level below 0.05 indicates that the null hypothesis can be rejected, confirming that factor analysis is appropriate because the assumption of unity is violated (37).

Reliability

Internal consistency was determined using Cronbach's alpha. According to previous studies, alpha values above 0.9 are excellent, above 0.8 are good, above 0.7 are acceptable, and between 0.5 and 0.7 are considered debatable, weak, or unacceptable (38, 39).

STATISTICAL ANALYSIS Statistical analyses included descriptive tests, Exploratory Factor Analysis, Kaiser–Meyer–Olkin and Bartlett, and Cronbach's alpha. All analyses were performed using SPSS version 18 software.

Ethical considerations Ethical approval for this study was obtained from the Scientific Research Ethics Committee at King Saud University (Ref: KSU-HE-24-892). All research activities adhered to the ethical principles outlined in the Declaration of Helsinki by World Medical Association (40) and the national guidelines for research involving human participants.

RESULT

Data Screening and Preparation

Both datasets were screened to ensure data quality and appropriateness for analysis (41, 42). Initial checks confirmed correct variable types, coding, and labeling. No missing values were identified, and all responses fell within the expected range for 5-point Likert scale responses, with no extreme outliers detected (43). Negatively worded items were reverse-coded to maintain consistent directionality.

Demographical findings

A total of 254 healthcare professionals participated in the study. As shown in Table 3, most participants were employed in the public sector (62.6%) and primarily worked in secondary-level facilities (47.2%). Regional distribution was broad, with the eastern region contributing the largest share (28%), followed by the central (26.4%) and western regions (17.3%).

Facilities represented in the sample covered various chronic conditions, with diabetes services being the most common (76.4%), followed by respiratory (74.8%), renal (70.5%), and cardiac illnesses (66.5%). Services for cancer, stroke, mental illnesses, and other chronic health conditions were also reported, though to a lesser extent.

Participants ranged in age from 25 to 60 years (M = 42.39, SD = 8.69), with a nearly equal gender split (50.8% male, 49.2% female). Most respondents were Saudi nationals (67.7%) and held a bachelor's degree or higher (89.8%). Allied health professionals constituted the largest occupational group (39.4%), followed by nurses (32.3%) and physicians (28.3%). The average length of healthcare experience was 18.47 years (SD = 7.60). At the time of data collection, the majority (72%) were engaged in clinical roles.

Table 3: Demographic Characteristics of the participants (N = 254).

Variables		***N***	***%***	***Mean***	***SD***
Sector	Public sector	159	62.6	-	-
	Private sector	95	37.4		
Organization type	PHC	52	20.5	-	-
	Secondary hospital	120	47.2		
	Tertiary hospital	82	32.3		
Geographic region	Central	67	26.4	-	-
	Eastern	71	28		
	Western	44	17.3		
	Northern	41	16.1		
	Southern	31	12.2		
Chronic health conditions	Diabetes	194	76.4	-	-
	Cancer	126	49.6		
	Stroke	139	54.7		
	Respiratory	190	74.8		
	Cardiac	169	66.5		
	Renal	179	70.5		
	Mental	136	53.5		
	Other	13	5.1		
Age	From 25 to 35	55	21.7	42.39 (years)	8.688
	From 36 to 46	122	48		
	47 and more	77	30.3		
Gender	Male	129	50.8	-	-
	Female	125	49.2		
Nationality	Saudi	172	67.7	-	-
	Non-Saudi	82	32.3		
Education	Diploma or less	26	10.2	-	-
	Bachelors	130	51.2		
	Postgraduate	98	38.6		
Experience	From 1 to 13	62	24.4	18.47	7.596
	From 14 to 26	147	57.9	(years)	
	27 and more	45	17.7		
Occupation	Physicians	72	28.3	-	-
	Nurses	82	32.3		
	Allied health	100	39.4		
Work nature	Clinical	183	72	-	-
	Administrative	71	28		

Content and face validity

The initial questionnaire consisted of 34 items covering seven dimensions, namely HSO (questions 1 to 6), CRL (7 to 9), SMS (10 to 13), DSS (14 to 17), DSD (18 to 23), CIS (24 to 28), and WA (29 to 34). Several items were modified based on the expert panel's insights to confirm face validity. The content validity of the questions was

confirmed after checking and revising several questions.

Following best practices for small expert panels (5 members), a Content Validity Index (CVI) was calculated based on expert ratings during the Modified Delphi rounds. Each item was rated on a 4-point relevance scale (1 = not relevant, 4 = highly relevant). Ratings of 3 or 4 were considered agreement.

Two indices were computed:

- **Item-level Content Validity Index (I-CVI):** the proportion of experts rating an item as relevant (No. of Agreement / No. of Experts).
- **Scale-level Content Validity Index (S-CVI):** the average of all I-CVIs across the instrument items (Sum of I-CVI / No. of Items).

As shown in Table 4, final items achieved an I-CVI of 1.00, indicating full agreement among experts. The S-CVI was also 1.00, meeting the recommended threshold for this panel's group.

Table 4: Final Item-level Content Validity Index (CVI).

Item #	*Expert#1*	*Expert#2*	*Expert#3*	*Expert#4*	*Expert#5*	*I- CVI*
1	4	4	4	4	4	1
2	4	4	4	3	4	1
3	3	3	4	3	4	1
4	4	3	4	3	4	1
5	4	4	4	4	3	1
6	4	3	3	4	4	1
7	4	3	4	4	4	1
8	4	4	4	4	4	1
9	4	3	3	4	4	1
10	3	3	4	3	4	1
11	4	4	4	4	4	1
12	4	3	4	4	3	1
13	4	4	3	3	4	1
14	4	4	4	3	4	1
15	3	4	4	3	3	1
16	3	4	4	4	3	1
17	4	4	4	4	4	1
18	3	4	3	4	4	1
19	4	4	4	4	3	1
20	4	3	3	4	4	1
21	3	4	4	4	3	1
22	4	3	3	3	4	1
23	4	4	4	3	4	1
24	4	4	4	4	3	1
25	3	4	3	4	4	1
26	4	4	3	3	4	1
27	4	4	4	4	4	1
28	3	3	4	3	4	1
29	4	4	4	4	4	1
30	4	3	4	4	3	1
31	4	4	3	3	4	1
32	3	3	4	3	4	1
33	4	4	4	4	4	1
34	4	3	4	4	3	1
S- CVI						1

Construct validity

The Kaiser-Meyer-Olkin (KMO) value was 0.91, which exceeds the recommended threshold of 0.60, so the model was confirmed, and the data related to the factors influencing the quality of primary health

services were suitable for factor analysis. Bartlett's Test of Sphericity was statistically significant ($p < 0.05$), which supports the factorability of the data and justifies factor extraction.

EFA using Principal Component Analysis (PCA) with Varimax rotation yielded seven factors, explaining 63.5% of total variance. Items with loadings ≥ 0.30 were retained. Items with lower loadings were reviewed for potential modification or removal, unless their retention was supported by strong theoretical justification (36).

The factor analysis detailed in Table 5 revealed a structure that differed in part from the original conceptual framework. The higher the absolute value of these coefficients, the more important the relevant factor is in the desired variable's total change. While the majority of items demonstrated alignment with their intended theoretical dimensions, some exhibited cross-loadings across multiple factors. This pattern may reflect the interrelated nature of chronic healthcare domains in real-world healthcare settings, particularly within the Saudi context. Despite these statistical deviations, the original theoretical structure was retained to preserve conceptual integrity and consistency with the foundational frameworks guiding instrument development. This divergence suggests areas for further refinement and encourages future studies to confirm structural validity.

Table 5: Exploratory Factor Analysis (EFA).

Item	*Conceptual Dimension*	*Empirical Component (Highest Loading Factor)*
1	HSO	7
2	HSO	1
3	HSO	6
4	HSO	4
5	HSO	1
6	HSO	1
7	CRL	1
8	CRL	2
9	CRL	1
10	SMS	1
11	SMS	1
12	SMS	1
13	SMS	5
14	DSS	5
15	DSS	1
16	DSS	3
17	DSS	2
18	DSD	2
19	DSD	2
20	DSD	2
21	DSD	2
22	DSD	2
23	DSD	4
24	CIS	4
25	CIS	2
26	CIS	2
27	CIS	4
28	CIS	4
29	WA	3
30	WA	3
31	WA	3
32	WA	3
33	WA	3
34	WA	3

Reliability

Internal consistency was evaluated using Cronbach's alpha, with $\alpha \geq 0.70$ considered acceptable. As detailed in Table 6, all dimensions demonstrated high reliability (α range: 0.75–0.85), and the full instrument achieved an alpha of 0.95, indicating excellent internal consistency.

Table 6: Reliability Statistics.

Dimension	*N of Items*	*Cronbach's alpha*
HSO	6	0.80
CRL	3	0.76
SMS	4	0.79
DSS	4	0.76
DSD	6	0.84
CIS	5	0.75
WA	6	0.85
Total instrument	34	0.95

Corrected item-total correlations ranged from 0.40 to 0.73, confirming that all items contributed meaningfully. Most inter-item correlations are between 0.20 and 0.50, which is healthy for a multidimensional instrument. No item deletion significantly affected reliability, and inter-item correlations ($r > 0.85$) indicated no extreme redundancy.

These findings confirm that the scale has high internal consistency without overlapping or repetitive content.

As outlined in Table 7, the final model comprises seven main dimensions and 34 sub-dimensions, derived from both the original CCM and the newly added awareness dimension. These sub-dimensions were systematically converted into measurable items for the provider assessment tool, as detailed in Table 8.

Table 7: Provider Perspective Dimensions.

Main Dimensions	*Sub Dimensions*
Healthcare System Organization	Overall Organizational Leadership in Chronic Illness Care.
	Organizational Goals for Chronic Care.
	Improvement Strategies for Chronic Illness Care.
	Incentives and Regulations for Chronic Illness Care.
	Leadership Involvement.
	Leadership outcomes.
Community Resources Linkages	Linking Patients to Outside Resources.
	Partnerships with Community Organizations.
	Regional health plans.
Self-Management Support	Assessment and Documentation of Self-Management Needs and Activities.
	Self-management support.
	Addressing Concerns of Patients and Families.
	Effective Behavior Change Interventions and Peer Support.
Decision Support System	Evidence-based guidelines.
	Involvement of Specialists in Improving Primary Care.
	Provider Education for Chronic Illness Care.
	Informing Patients about Guidelines.
Delivery System Design	Practice team functioning.
	Practice team leadership.
	Appointment system.
	Follow-up system.
	Planned Visits for Chronic Illness Care.
	Continuity of Care.
Clinical Information Systems	Registry availability.

	Reminders to Providers.
	Feedback to improve team performance.
	Information about Relevant Subgroups of Patients Needing Services.
	Patient treatment plans.
Workforce Awareness of a National Health Program	Knowledge of Chronic Care Objectives.
	Training on Chronic Care Management.
	Knowledge of Chronic Care Implementation.
	Communication and Collaboration on Chronic Care.
	Attitudes Toward Chronic Care in HSTP.
	Monitoring and Evaluation of Chronic Care.

Table 8: Questionnaire items.

No.	***Item***
1	Chronic illness care is part of the organization's long-term strategy.
2	The healthcare goals for chronic illness are being reviewed to improve the services provided.
3	Proven improvement strategies are proactively implemented to achieve chronic illness care goals.
4	Incentives or regulations motivate providers to support the goals of chronic illness care.
5	Managers participate in chronic illness care improvement efforts.
6	Leadership encourages patients' self-management of their chronic illness.
7	The coordination of patient chronic illness cares links patients to community resources.
8	Organization seeks partnerships with community entities to develop programs for chronic illness care.
9	Regional health plans adopt chronic illness guidelines.
10	Patients' needs for self-management of their chronic illness are assessed, documented, and linked to the treatment plan.
11	Clinical educators are trained to provide self-management support to patients with chronic illnesses.
12	Patient and family concerns are addressed during the provision of healthcare to chronically ill patients.
13	Behavior change interventions are part of routine care provided to chronically ill patients.
14	Evidence-based guidelines are integrated into chronic illness healthcare.
15	Specialists are involved in improving primary care for chronic illness patients.
16	All practice teams receive training in chronic illness healthcare.
17	Patients receive materials outlining their role in adhering to healthcare guidelines.
18	Practice teams meet regularly to manage patient chronic illness care.
19	A team leader ensures clear roles and responsibilities for chronic illness care.
20	The appointment system allows patients to see multiple providers in a single visit.
21	The follow-up system utilizes various methods to ensure treatment plan adherence.
22	Planned visits for chronic illness care are used for all patients.
23	Continuity of care is a priority, through coordination between primary care and hospitals.
24	Patient registries are utilized to track and provide healthcare services.
25	Providers receive necessary reminders during patient healthcare provision.
26	A feedback strategy is employed to improve treatment team performance.
27	Providers routinely receive information about chronically ill patients who need services.
28	Patient treatment plans are collaboratively developed at every point of care.
29	I am aware of the chronic healthcare management objectives outlined in the HSTP.
30	I have received training on implementing chronic healthcare strategies as part of the HSTP.
31	I have knowledge about how chronic healthcare is integrated and implemented within the HSTP at my healthcare facility.
32	There is collaboration among healthcare teams regarding chronic healthcare management within the framework of the HSTP.
33	I believe the chronic healthcare initiatives in the HSTP have positive impact on patient outcomes.
34	I am aware of the evaluation processes of chronic healthcare management within the HSTP.

Scoring Design

A 5-point Likert scale was adopted for its simplicity and efficiency, enabling providers to complete the instrument quickly in busy clinical environments. The tool comprises 34 items organized across seven dimensions, with each item rated from 1 (Strongly Disagree) to 5 (Strongly Agree), as detailed in Table 9. Higher scores indicate better implementation of chronic healthcare practices, while several items

were reverse-coded to maintain scoring directionality.

Table 9: Likert Scale Interpretation.

Scale	*Interpretation*
1	Strongly disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly agree

The scoring framework enables the identification of service strengths and gaps, with interpretation guided by the cut-off ranges in Table 10.

Table 10: Mean Score Range Interpretation.

Mean Score Range	*Interpretation*
1.00 – 1.79	Limited support for chronic healthcare
1.80 – 2.59	Basic support for chronic healthcare
2.60 – 3.39	Moderate support for chronic healthcare
3.40 – 4.19	Good support for chronic healthcare
4.20 – 5.00	Full support for chronic healthcare

DISCUSSION

This study aimed to develop and validate a simplified, contextually relevant instrument to assess healthcare providers' perceptions of chronic healthcare services in Saudi Arabia. The final questionnaire included 34 items across seven key dimensions: health system organization, community resource linkages, self-management support, decision support system, delivery system design, clinical information system, and workforce awareness of national transformation goals. Unlike the instrument by Cramm et al. (2011), which focused on patient-centered care using a shortened version of the ACIC, or the QCPC developed by Steinhaeuser et al. (2011), this instrument maintains the core CCM structure while integrating policy alignment, offering a more tailored fit for Saudi Arabia's evolving healthcare landscape (7, 10).

The results of the EFA generally supported the instrument's theoretical structure, with the seven extracted factors explaining 63.5% of the total variance. This result exceeds the conventional threshold of 60% recommended for construct validation (36) and compares favorably with other studies using adapted versions of the ACIC and PACIC instruments, which typically report explained variances ranging between 60% and 70% (10, 44). After rotation, the most influential dimensions were Self-Management Support and Delivery System Design, which accounted for 14.84% and 13.78% of the variance respectively, for a combined 28.62%. This indicates that provider perceptions of chronic healthcare in Saudi Arabia are most strongly shaped by the capacity to empower patients in managing their conditions and by the structural organization of care delivery processes.

Although a few items demonstrated cross-loadings or deviated from their expected dimensions, this is not uncommon in multidimensional constructs such as chronic care delivery, where the domains often overlap in practice. Previous studies adapting CCM-based instruments (9, 21) similarly noted overlaps due to the inherently interconnected nature of healthcare delivery domains. Within the evolving Saudi healthcare system, characterized by integration and transformation initiatives, such overlaps may reflect contextual realities rather than structural flaws.

The instrument demonstrated excellent internal consistency, with Cronbach's alpha values exceeding 0.75 across all subscales and reaching 0.95 for the overall scale. This

aligns with reliability benchmarks reported in international studies utilizing the ACIC and its adaptations (e.g., Steinhaeuser et al., 2011 reported α = 0.85; Cramm et al., 2011 reported α = 0.92). These results affirm the robustness of the tool for use in routine assessment and quality monitoring within chronic healthcare settings.

A significant contribution of this tool is the inclusion of the Workforce Awareness dimension, which captured provider knowledge and alignment with national healthcare transformation goals. The relatively lower scores in this domain highlight persistent gaps in communicating strategic objectives to frontline staff—a trend also observed in previous assessments of health reform implementation (18). Addressing this gap is crucial, as workforce engagement is increasingly recognized as a determinant of reform success (24, 25).

LIMITATIONS

This study included data from providers across most regions in Saudi Arabia; however, not all health clusters were represented, and the sample size per region was relatively small. This may limit generalizability at the cluster or institutional level. The cross-sectional, self-reported nature of the data also introduces potential response bias. Additionally, while EFA was conducted, confirmatory factor analysis (CFA) was not performed and is recommended for future validation.

CONCLUSION

This study developed and validated a multi-dimensional instrument to assess chronic healthcare services from the perspective of providers within the Saudi healthcare system. The tool demonstrated strong reliability and construct validity, supporting its use in evaluating service delivery in alignment with the Health Sector Transformation Program. With its simplified format and inclusion of a novel workforce awareness dimension, the instrument offers a standardized yet context-sensitive approach to chronic healthcare assessment. Future research is encouraged to further validate the tool across different provider groups, settings, and regions, and to explore its adaptability through cross-cultural applications.

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