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ORIGINAL RESEARCH

Translation, Cross-Cultural Adaptation, and Psychometric Properties of the Arabic Consumer Assessment of Healthcare Providers and Systems—Clinician and Group Survey (CG-CAHPS): A Cross-Sectional Study

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Purpose: Patient experience is a vital component of healthcare quality, playing a significant role in patient-centered care. Despite the global applicability of the Consumer Assessment of Healthcare Providers and Systems—Clinician and Group Survey (CG-CAHPS), there is a lack of reliable, culturally adapted instruments for assessing patient experience in Arabic-speaking populations. Therefore, we translated, adapted, and validated an Arabic version of the CG-CAHPS to assess patient experiences in Saudi Arabia.

Patients and Methods: This cross-sectional study surveyed a convenience sample of 281 outpatients at two heart failure clinics to evaluate the psychometric properties of the Arabic CG-CAHPS—including structural validity, criterion validity, and reliability. The survey consisted of four domains—Access to Care; Communication with Healthcare Professionals; Care Coordination; and Helpful, Courteous, and Respectful Staff. Structural validity was assessed using Confirmatory Factor Analysis (CFA) Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI), both with values greater than 0.90, as well as the Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR). Reliability was evaluated via Cronbach's alpha (α) for internal consistency, while criterion validity was tested through inter-item correlations with the overall ratings for the recent visit and healthcare provider.

Results: The confirmatory factor analysis supported the hypothesized four-factor model, demonstrating adequate structural validity and a good fit (CFI =0.927, TLI =0.906, RMSEA =0.097, and SRMR =0.083). All factor loadings were significant ($p < 0.001$), ranging from 0.57 to 0.93. Criterion validity was supported by strong correlations between the survey domains and the patient ratings regarding visits and providers—of which the Helpful, Courteous, and Respectful Staff domains showed the highest correlation (r=0.561). Cronbach's alpha demonstrated high internal consistency (α=0.909)—with each domain exceeding the 0.70 threshold.

Conclusion: The Arabic CG-CAHPS is a reliable and valid tool for assessing patient experiences in Saudi healthcare settings. Its application can facilitate the enhancement of patient-centered care and contribute to ongoing efforts to improve healthcare quality in Saudi Arabia. Future research should assess the tool's applicability in other healthcare contexts and regional populations.

Keywords: psychometrics, Saudi Arabia, patient-centered care

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Introduction

Patient experience represents a fundamental element of healthcare quality and patient-centered care, especially given the rapid expansion of the healthcare sector and the integration of high-standard organizations.[1] The transition to patient-centered care underscores the need to understand and enhance patients' healthcare-related experiences.[2] Broadly defined, patient experience encompasses a spectrum of interactions within healthcare systems—including engagements with health plans and care provided by healthcare professionals in various settings.[3,4] Key components of patient experience focus on timely appointments, accessibility of health information, and effective communication with healthcare providers.[4] Addressing concerns related to patient experience is pivotal to improving the quality of healthcare services[5,6] and influencing future patient behavior in aspects such as continued engagement with the healthcare system.[7] Therefore, healthcare providers significantly influence the patient experience and perceived quality of care.[8,9]

A lack of robust measurement tools to characterize the experiences of patients from diverse linguistic backgrounds may impede initiatives aimed at improving care delivery, leading to suboptimal patient outcomes and diminished healthcare service quality.[10,11] Thus, the cultural and linguistic adaptation of such instruments while preserving the integrity of their content, is essential for effective cross-cultural healthcare utilization.[12] Developing tools that accurately capture patient experiences with healthcare providers is vital.

Many approaches have been used to address the need to capture patient experiences with healthcare. Researchers and healthcare organizations have used patient narratives,[13–15] while others have developed quantitative approaches.[16–18] Despite this diversity, several major scales have been designed to measure patient experience, which vary in their reliability, validity, responsiveness, and acceptability.[19–21] Among these, the Consumer Assessment of Healthcare Providers and Systems—Clinician and Group Survey (CG-CAHPS) is one of the most empirically validated tools globally for assessing patient experiences with healthcare providers.[22] This tool is a benchmark for tracking performance improvements in many healthcare systems worldwide.[3,4]

Furthermore, CG-CAHPS is recognized for its comprehensive ability to capture multiple aspects of patient-provider interactions, making it an ideal tool for evaluating patient experiences in diverse settings. In Saudi Arabia, the healthcare system features distinct patient demographics, cultural norms, and the predominant use of the Arabic language. Alongside the accelerating healthcare transformation of the country, the government is committed to enhancing the quality and efficiency of healthcare services through improved patient experiences.[23] However, there is a lack of culturally appropriate tools for assessing and improving patient experiences within Saudi healthcare services. While our previously published study[24] reported findings on the patient experience scores for physicians and advanced practice nurses to provide valuable insights into patient experience comparisons, it did not report the psychometric properties of the CG-CAHPS tool. This study therefore seeks to fill this gap by establishing the psychometric properties of the Arabic version of CG-CAHPS, enabling a reliable evaluation of patient experience with healthcare providers in Saudi Arabia.

Material and Methods

Design, Setting, and Participants

Using convenience sampling, this cross-sectional study utilized a paper-based, self-administered survey to include patients, aged 18 years and older, who visited two heart failure clinics in Saudi Arabia between February and September 2023. Both physicians and advanced practice nurses (APNs) operated these clinics. Experienced nurses employed at the clinics distributed the self-administered questionnaires to all outpatients aged 18 years or older who could read and write in Arabic and visited the clinics during the study period. Continuous sampling was implemented until the target sample size was achieved. Confirmatory Factor Analysis (CFA) was conducted to assess the structural validity of the Arabic version of CG-CAHPS, ensuring that the factor structure aligns with the original theoretical framework. To ensure an adequate sample size for psychometric analyses, the study adhered to Nunnally's[25] psychometric evaluation principles, recommending a respondent-to-item ratio of 10:1. This method aligns with other studies demonstrating the adequacy of this ratio in CFA analysis.[26,27] Thus, the required sample size for psychometric analysis was set at a minimum of 160 participants.

Measures

The study used the CG-CAHPS Version 3.1. A panel of experts reviewed the survey to assess its relevance and applicability to the healthcare context in Saudi Arabia. The expert panel responsible for the translation consisted of the authors, five of whom held advanced practice nursing degrees and had extensive research experience relevant to the study's context. To ensure a comprehensive evaluation of the patient's experiences, the panel included a selected item from the Adult Visit Survey Version 4.0 into the CG-CAHPS Version 3.1. This addition was necessary to capture visit-related experiences since the CG-CAHPS Version 3.1 primarily focuses on patients' experiences with healthcare providers. No modifications were made to the original items.

The CG-CAHPS survey consisted of four domains measured on a Likert scale ranging from 1 (never) to 4 (always). These domains were Access to Care (3 items); Communication with Healthcare Professionals (4 items); Care Coordination (3 items); and Helpful, Courteous, and Respectful Staff (4 items). Moreover, it included two single-item measures assessing the overall rating of the provider and the visit on a numeric scale ranging from 0 (worst possible) to 10 (best possible). The CG-CAHPS followed a normalized composite scoring method to convert domain scores to a 0–100 scale using the following equation:[4]

$$\text{Converted Score} = [(\text{Respondent's selected response value} - \text{Minimum response value on the scale})/ (\text{Minimum response value} - \text{Maximum response value})] \times 100$$

The CG-CAHPS items and those added from the Adult Visit Survey Version 4.0 were initially translated into Arabic by two bilingual nurses with Master of Science degrees in nursing. Once the translation was completed, the expert panel reviewed the Arabic version to ensure its semantic, experiential, and conceptual equivalence to the original survey. To ensure the accuracy and reliability of the translation, the final Arabic version was back-translated into English by two independent bilingual nurses with no prior exposure to the original survey. The expert panel then reviewed the back-translated version to verify that the translated items maintained the integrity and validity of the original. The panel concluded that the Arabic version of the survey was culturally and linguistically appropriate for Arabic-speaking participants. Additionally, a readability test was conducted to evaluate the clarity and comprehension of the translated version among Arabic-speaking participants, with no issues reported in the questionnaire. In addition to the CG-CAHPS items, the study included demographic variables, such as sex, age, and educational level.

Statistical Analysis

Descriptive statistics—including means, standard deviations, frequencies, and percentages—were calculated for the sample characteristics and key variables using SPSS Statistics 29 (IBM Corp., Armonk, NY, USA). To investigate the factor structure of the Arabic-translated and modified version of the CG-CAHPS, Confirmatory factor analysis (CFA), as part of the study design to validate the pre-existing measurement model, was performed utilizing Pearson correlations and the maximum likelihood method in JASP version 0.17.1 software (JASP, Amsterdam, Netherlands), and a factor threshold of ≥ 0.40 was considered acceptable.[28] Goodness-of-fit was evaluated using the following criteria: Comparative fit index (CFI) and Tucker-Lewis index (TLI) values of > 0.90, as well as root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) values of ≤ 0.10.[29–31] The reliability of the Arabic-translated and modified CG-CAHPS was assessed using Cronbach's alpha, with an acceptable value set at ≥ 0.70.[28]

Results

As represented in Table 1, 281 participants were included in this study, with 67.8% identifying as male. The ages of the participants ranged between 18 and 75 years, with 47.7% within the 55–74-year age group. Most participants (60.8%) had a high school education or below.

Structural Validity

Figure 1 illustrates the path diagrams from our CFA, conducted to assess the factor structure of the Arabic-translated and modified CG-CAHPS. The model demonstrated an acceptable fit, with a CFI of 0.927 and a TLI of 0.906—both exceeding the

Table 1 Demographics of the Participant Cohort (N = 281)

Characteristic	Mean ± SD or n (%)
Sex	
Male	182 (64.8%)
Female	78 (27.8%)
Missing	21 (7.5%)
Age	
18–24	8 (1.8%)
25–34	28 (10.0%)
35–44	33 (11.7%)
45–54	57 (20.3%)
55–64	89 (31.7%)
65–74	45 (16.0%)
≥ 75	20 (7.1%)
Missing	4 (1.4%)
Highest completed grade or educational level	
High school or below	171 (60.8%)
Associate's diploma	42 (14.9%)
Bachelor's degree	55 (19.5%)
Post-graduate degree	7 (2.5%)
Missing	6 (2.1%)

Abbreviation: SD, standard deviation.

recommended threshold and indicating an acceptable model fit. The RMSEA was 0.097, with a 90% confidence interval of 0.085–0.110, representing a weaker fit compared to other indices.[29,30] The SRMR was 0.083, which was slightly above the acceptable traditional cut-off value of 0.08.[31] However, when considered alongside the strong CFI and TLI values, the overall model fit was deemed sufficient. All factor loadings were statistically significant ($P < 0.001$), ranging between 0.57 and 0.93, thus indicating varying item contributions to the construct. While most items exhibited strong loadings (≥0.70), some showed moderate loadings (eg, 0.57), suggesting variability in the strength of item-factor relationships. No modification index-based modifications were made as the model fit was acceptable.

Criterion Validity

Table 2 provides the Pearson correlation coefficients between the Arabic CG-CAHPS domains and the overall ratings for the recent visit and healthcare provider. All subscales correlated significantly with the overall ratings for the recent visit and provider. The Helpful, Courteous, and Respectful Staff domain showed the moderately correlated with the overall rating for the recent visit ($r = 0.561$) and weekly correlated with the overall rating of the provider ($r = 0.241$). The total score of the scale was moderately correlated with the overall rating for the recent visit ($r = 0.574$), indicating variability in the strength of criterion validity.

Reliability

Table 3 provides the score distribution and internal consistency reliability for the Arabic-translated and modified versions of the CG-CAHPS. All item-total correlations exceeded the 0.30 criterion, ranging between 0.459 and 0.890, indicative of sufficient correlation.[25] The survey exhibited high internal consistency, evidenced by a Cronbach's alpha of 0.909—demonstrating excellent reliability; however, statistically, such a high value may suggest some degree of item redundancy. The Cronbach's alpha exceeded the 0.70 criterion for all individual domains, confirming the reliability of the scale across its different components.

Discussion

This study developed and evaluated the psychometric properties of the Arabic-translated and modified version of the CG-CAHPS—a standardized tool for assessing patient experience—in Saudi Arabian healthcare settings. Our findings

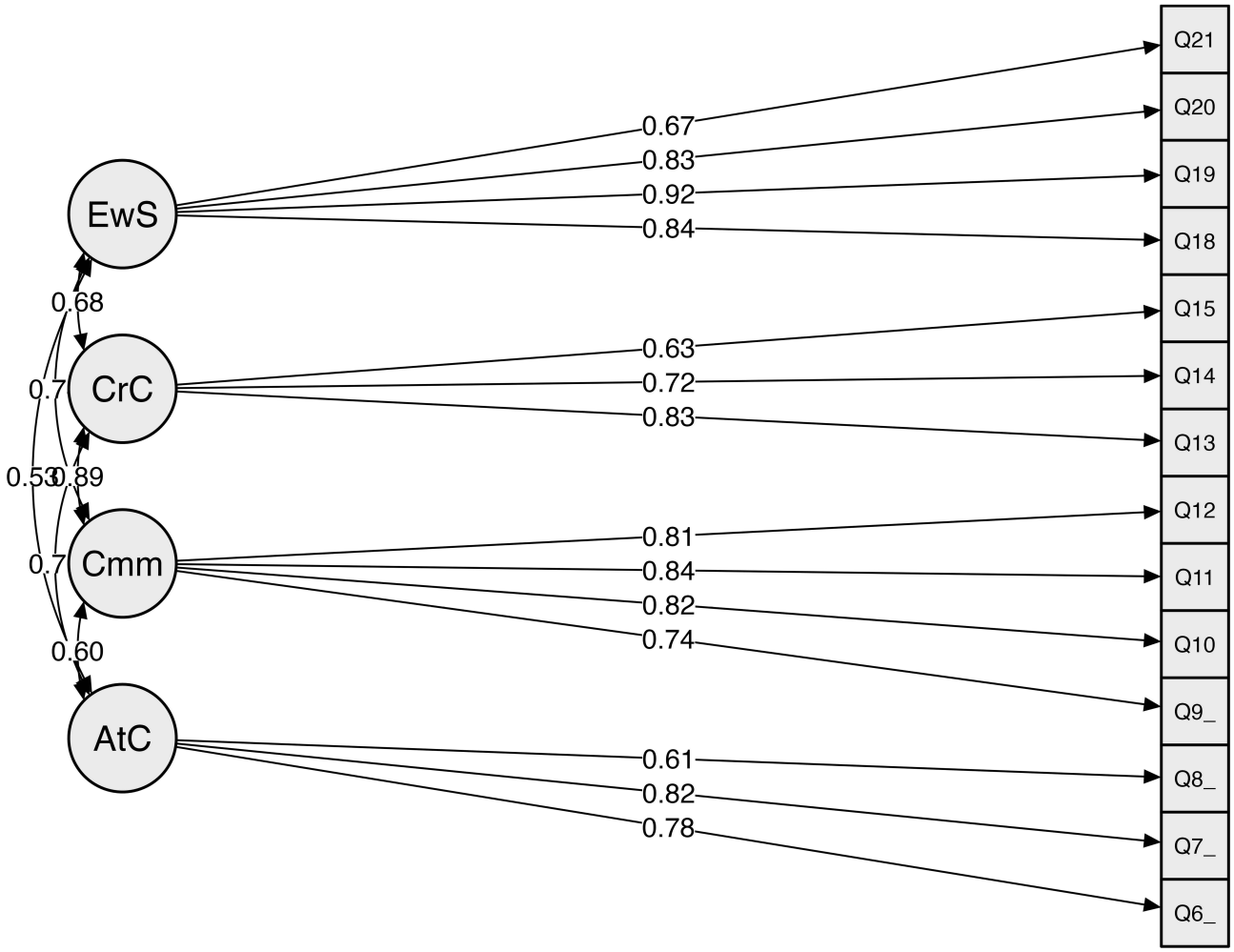

Figure 1 Path diagrams from the confirmatory factor analysis for the Arabic CG-CAHPS.

demonstrate that the Arabic CG-CAHPS represents both a reliable and valid instrument, supporting its potential utility in terms of improving patient-centered care and healthcare quality in the region.

Our CFA provided evidence for the structural validity of the tool, supporting the four hypothesized four-domain structure, aligning with the initial theoretical framework: Access to Care; Communication with Healthcare Professionals; Care Coordination; and Helpful, Courteous, and Respectful Staff. While the RMSEA and SRMR values were on the borderline of acceptability, the strong CFI and TLI values suggest that the overall fit of the model was sufficient—confirming the

Table 2 Pearson Correlation Between the Arabic CG-CAHPS Domains and the Overall Ratings for Recent Visits and Providers

	Overall Rating for Recent Visit	**Overall Rating of Provider**
Access to Care	0.370**	0.218**
Communication with Healthcare Professionals	0.471**	0.214**
Care Coordination	0.426**	0.203**
Helpful, Courteous, and Respectful Staff	0.561**	0.241**
Total Score	0.574**	0.268**

Notes: **Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

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Table 3 Internal Consistency Reliability of the Arabic CG-CAHPS

	Number of Items	Mean	Standard Deviation	Observed Range	Item-Total Correlation	Cronbach's Alpha
Access to care	3	71.96	27.00	0–100	0.459–0.701	0.773
Communication with Healthcare Professionals	4	87.27	20.85	0–100	0.692–0.815	0.893
Care Coordination	3	78.48	25.94	0–100	0.601–0.980	0.788
Helpful, Courteous, and Respectful Staff	4	86.50	20.34	8.33–100	0.620–0.833	0.886
Overall score	14	81.89	19.32	2.38–100	0.495–0.757	0.909

robustness of the factor structure. These findings reinforce the appropriateness of the four-domain model in this context, indicating that the tool effectively captures the intended constructs. This validation suggests that the instrument can be reliably used in similar Arabic-speaking populations for assessing patient experiences with healthcare providers. This outcome aligns with findings from similar studies, such as the Japanese CG-CAHPS[30]—where the same composites were validated, thereby reflecting the global applicability of the CG-CAHPS framework.[22]

In terms of criterion validity, the high correlation between the Helpful, Courteous, and Respectful Staff domain and the overall ratings of both the recent visit and provider underscores the significant impact the staff behavior plays on patient satisfaction. This corroborates previous research, indicating that interaction with healthcare staff is a key driver of patient experience.[20] The overall scale score strongly correlated with the overall visit rating, further validating the ability of the instrument to capture essential aspects of patient care.

The internal consistency of the Arabic CG-CAHPS was high, as indicated by a Cronbach's alpha of 0.909—exceeding the recommended threshold of 0.70 for all domains. This level of reliability is comparable to those of other translated versions of CG-CAHPS[32] and underscores the robustness of the tool for use in diverse cultural settings. Furthermore, all domains in this study met the reliability criteria, reflecting the consistency of responses in the Saudi context.

Implications

The results of this study have important implications for healthcare practice and policy in Saudi Arabia. The availability of a culturally and linguistically validated tool for assessing patient experience provides healthcare providers and policymakers with a valuable resource for measuring and improving the quality of care delivered in the region. Given the significant role that patient experience plays in shaping healthcare outcomes and future engagement with healthcare services,[7] using the Arabic CG-CAHPS can facilitate targeted interventions to enhance patient-centered care in the Saudi healthcare system. This tool may contribute to national efforts to monitor and improve healthcare service quality, aligning with the ongoing healthcare transformation goals in Saudi Arabia.[23]

Limitations

Despite the strengths of this study, some key limitations should be acknowledged. First, the study was conducted in heart failure clinics, which may limit the generalizability of the findings to other healthcare settings. Future research should explore the use of Arabic CG-CAHPS in a broader range of healthcare environments to confirm its generalizability across different patient populations. Second, the RMSEA value of 0.097, indicating poor fit. While other fit indices were acceptable, this weaker fit should be considered in result interpretation. Future studies may explore model refinements to improve fit. Moreover, Further testing with larger and more diverse samples is warranted to ensure the reliability and validity of the instrument across different demographic groups.

Conclusion

The Arabic version of the CG-CAHPS exhibited satisfactory psychometric properties, making it a suitable, reliable, and valid tool for assessing patient experiences with healthcare providers in Saudi Arabia and similar contexts. The CFA

findings validate the four-domain structure, ensuring that the instrument accurately captures key aspects of patient-centered care. This tool has the potential to play a critical role in helping healthcare providers and supporting healthcare quality improvement initiatives by allowing healthcare practitioners to gain valuable insights into patient perceptions, identify areas for improvement, and enhance service quality, while fostering patient-centered care, which is in alignment with the ongoing healthcare transformation goals in Saudi Arabia. Future research should continue to validate and refine the instrument in different healthcare settings and populations to ensure its broader applicability.

Abbreviations

CFA, Confirmatory factor analysis CFI, Comparative fit index; CG-CAHPS, Clinician and Group Survey; RMSEA, Root mean square error of approximation; SRMR, Standardized root mean square residual; TLI, Tucker-Lewis index (TLI).

Data Sharing Statement

On reasonable request, the corresponding author provides the datasets used and/or analyzed during the current study.

Ethics Approval and Informed Consent

This study was approved by the King Saud University College of Medicine Institutional Review Board (Ref. No. E-22-6845) and from study settings (IRB# 22-507 and IRB# 2754/22). All methods were carried out in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines and the declaration of Helsinki. The informed consent form was obtained from all the subjects for participation in this study.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

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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