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ORIGINAL ARTICLE

# Knowledge, attitudes , and practices of primary health care physicians about irritable bowel syndrome in Al-Ahsa, Saudi Arabia

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## ABSTRACT

**Background:** Irritable bowel syndrome (IBS) is a common chronic gastrointestinal condition that significantly affects quality of life and imposes a considerable economic burden. Despite the availability of the Rome IV diagnostic criteria, gaps in primary health care (PHC) physician knowledge and practices have been reported. PHC physicians play a central role in the diagnosis, management, and follow-up of patients with IBS, making their awareness and application of the Rome IV criteria critical.

**Methods:** A descriptive cross-sectional study was conducted among PHC physicians in Al-Ahsa, Saudi Arabia, between June 2025 and September 2025. A structured, self-administered questionnaire, adapted from a previously validated tool, was used to assess knowledge, attitudes, and practices regarding IBS and the Rome IV criteria.

**Results:** A total of 99 physicians participated, most of whom were aged ≤40 years (95.0%), with residents (40.4%) and general practitioners (32.3%) forming the majority. Awareness of the Rome IV criteria was high: 89.9% reported familiarity, and 82.8% had used them previously; however, only 29.3% applied them routinely to all cases, while 56.6% used them only in selected cases. Knowledge gaps were identified regarding the required diagnostic timelines, with only half correctly identifying the 3-month symptom fulfillment criterion and approximately one-fifth reporting uncertainty. Although 65.7% believed the Rome criteria were effective for diagnosing IBS, continuity of care was inconsistent, with 69.7% reporting that they could only sometimes maintain follow-up.

**Conclusion:** PHC physicians in Al-Ahsa showed high awareness of IBS and the Rome IV criteria, but the routine application and continuity of care remained inconsistent. These preliminary findings should be interpreted cautiously and confirmed in larger, adequately powered studies.

**Keywords:** Irritable bowel syndrome, Rome IV criteria, knowledge, attitudes, and practices, primary health care, Al-Ahsa, Saudi Arabia.

## Introduction

Functional bowel disorders encompass a spectrum of chronic gastrointestinal conditions, of which irritable bowel syndrome (IBS) is the most prevalent and clinically significant [1]. The typical clinical picture involves recurrent abdominal pain or discomfort associated with changes in stool frequency or form [2]. IBS affects 5% to 20% of the general population in Western countries [3,4]. The global pooled prevalence, based on Rome III and IV criteria, is reported as 14.1% in a recent meta-analysis [3]. In Saudi Arabia, IBS has a relatively high prevalence, up

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to 20.7% in another meta-analysis [5]. Patients with IBS often experience severely reduced health-related quality of life, with scores comparable to those seen in chronic conditions, including impaired daily functioning, reduced work productivity, and increased healthcare utilization. IBS also imposes a significant economic burden through increased physician visits, diagnostic investigations, and productivity loss. The Rome IV criteria, released in 2016, represent the current gold standard for IBS diagnosis, defining the condition by recurrent abdominal pain at least one day per week for the last 3 months, associated with changes in stool frequency or form. PHC physicians are at the frontline of IBS care, often being the first point of contact for patients and responsible for long-term follow-up and management [4]. IBS subtypes are categorized by predominant bowel habit: constipation-predominant IBS, diarrhea-predominant IBS, mixed bowel habits IBS, and unclassified IBS [2]. However, despite established diagnostic criteria, evidence suggests that physicians' knowledge and application of the Rome IV criteria may be incomplete, contributing to delayed IBS diagnosis and inconsistent patient management. In addition, there is a lack of regional data on PHC physicians' practices regarding IBS in the Al-Ahsa region of Saudi Arabia. Therefore, this study aimed to assess the knowledge, attitudes, and practices of PHC physicians regarding IBS and the Rome IV diagnostic criteria in Al-Ahsa. The secondary objective was to evaluate the association between physicians' years of clinical experience and their IBS-related knowledge, attitudes, and practices.

## Methods

### *Study design and setting*

A descriptive cross-sectional study was conducted among PHC physicians in Al-Ahsa, Saudi Arabia, between June 2025 and September 2025. Al-Ahsa is located in the Eastern Province of Saudi Arabia and includes multiple governmental primary healthcare centers providing first-contact medical care to the population.

### *Study population*

The study included PHC physicians working in governmental PHC centers in Al-Ahsa, including general practitioners, family medicine residents, specialists, and consultants. Physicians not currently working in PHC centers or working in private healthcare facilities were excluded. Incomplete responses were also excluded.

### *Sample size*

The sample size was calculated using Raosoft at a 95% confidence level and a 5% margin of error. Based on an estimated total population of 409 PHC physicians in Al-Ahsa, the minimum required sample size was calculated to be 198 participants. However, only 99 physicians completed the questionnaire and were included in the final analysis. This represents 50% of the target sample, and the low recruitment rate may have introduced non-response bias.

### *Sampling method*

All PHC centers in the Al-Ahsa region were listed, and convenience sampling was performed for specific centers. From each chosen center, all physicians who were willing to participate and met the study's inclusion criteria were enrolled. Eligible physicians were invited either onsite at PHC clinics or online through official communication channels. Participation was voluntary.

### *Data collection tool (questionnaire)*

Data were collected using a structured, self-administered online questionnaire adapted from a previously validated study [6]. The questionnaire was designed to assess PHC physicians' knowledge, attitudes, and practices regarding IBS and the Rome IV criteria. It included items on sociodemographic characteristics, including age, gender, professional rank, and years of experience; general awareness of IBS and the Rome IV criteria; knowledge of diagnostic criteria and clinical understanding through six items; and attitudes and practices through seven items assessing clinical application, diagnostic behavior, and confidence in using the Rome IV criteria.

### *Data collection procedure*

The final questionnaire was distributed either onsite at PHC clinics or online through official communication channels. Participation was voluntary, and informed consent was obtained prior to completing the survey. Responses were collected anonymously to ensure confidentiality. The average completion time was 10-15 minutes.

### *Statistical analysis*

Data were analyzed using Microsoft Excel for Mac 2025 (version 16.98; Microsoft Corporation, Redmond, WA) and Jamovi (version 2.4.14; The Jamovi project, Sydney, Australia). Categorical variables were presented as frequencies and percentages, while continuous variables were summarized using means and SDs.

Associations between socio-demographic variables, particularly years of clinical experience, and knowledge, attitude, and practice scores were assessed using the chi-square test or Fisher's exact test (where expected cell counts were <5). A $p$-value of <0.05 was considered statistically significant.

### *Ethical considerations*

Ethical approval was obtained from the King Faisal University Research Ethics Committee (Ref no: KFU-REC-2025-MAY-ETHICS3453) on 28/05/2025. Participation was voluntary, informed consent was obtained electronically, and all data were kept anonymous and confidential.

## Results

Based on the analysis of the 99 participants, a clear demographic and professional profile emerges, heavily concentrated in the early stages of medical practice.

### *Demographic and professional profile*

The respondent pool is notably young, with 95.0% of participants aged 40 or younger. Specifically, the 20-30 years age group accounts for 59.6% of the sample, while the 31-40 years age group represents 35.4%. Professionally, the data reveal a heavy focus on roles associated with training and early-career stages. The majority of the sample comprises residents (40.4%) and general practitioners (32.3%), collectively accounting for over 72% of participants. Specialists constitute the next largest group at 24.2%, while consultants are a small segment, accounting for 3.0%. In terms of specialty, family medicine (59.6%) and general practitioner (36.4%) are the most common.

Participant characteristics are summarized in Table 1.

***Table 1.*** *Demographic characteristics of the participants (n = 99).*

| Variable | *n* | % |
|---|---|---|
| Age group | | |
| 20-30 years | 59 | 59.6% |
| 31-40 years | 35 | 35.4% |
| >40 years | 5 | 5.1% |
| Gender | | |
| Male | 76 | 76.8% |
| Female | 23 | 23.2% |
| Nationality | | |
| Saudi | 99 | 100% |
| Marital status | | |
| Married | 60 | 60.6% |
| Not married | 39 | 39.4% |
| Specialty | | |
| General practitioner | 36 | 36.4% |
| Family medicine physician | 59 | 59.6% |
| Others | 4 | 4.0% |
| Classification | | |
| General practitioner | 32 | 32.3% |
| Resident | 40 | 40.4% |
| Specialist | 24 | 24.2% |
| Consultant | 3 | 3.0% |
| Years of practice | | |
| <3 years | 41 | 41.4% |
| 3-5 years | 33 | 33.3% |
| >5 years | 25 | 25.3% |

*n*, number of participants, percentage (%).

### *Relationship between classification and years of experience*

When examining the relationship between professional classification and years of practice, distinct career profiles are apparent. Consultants, as the most senior classification, universally report >5 years of practice (100.0%). In contrast, general practitioners (53.1%) and residents (55.0%) are predominantly clustered in the <3 years of practice category, consistent with professionals in early career or training phases. Specialists present a different distribution: 62.5% fall into the 3-5 years of practice range, suggesting that this classification is often reached in the early to mid-career stage. A significant proportion of Specialists (29.2%) have >5 years of experience, with only a small number (8.3%) reporting <3 years.

### *Awareness and application of the Rome IV criteria*

Overall, the data indicate a high level of awareness regarding the diagnostic guidelines among surveyed practitioners. Of the 99 total participants, 89 (89.9%) confirmed that they had heard of the Rome IV criteria. Correspondingly, most respondents (82.8%) reported having used the criteria at least once in the past.

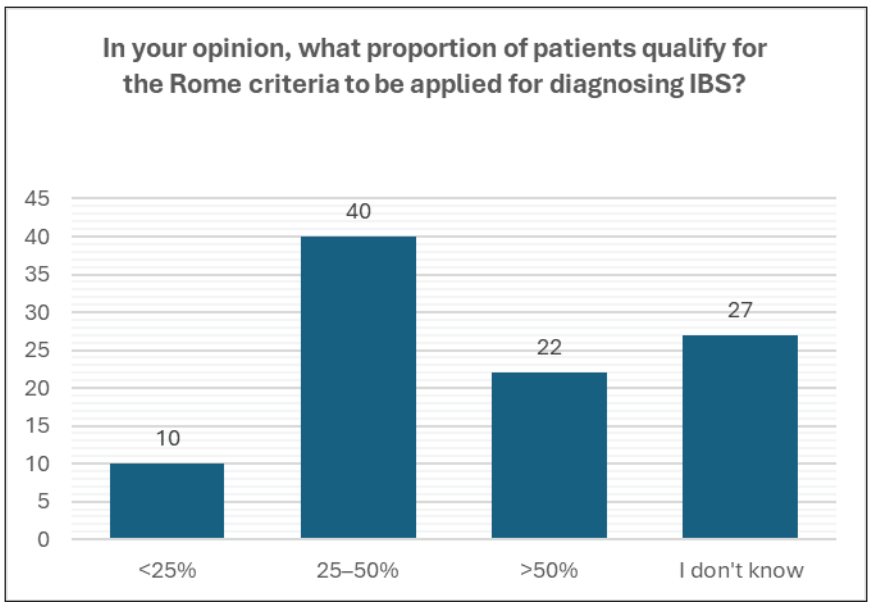


***Figure 1.*** *Estimated proportion of patients eligible for application of the Rome IV criteria, as reported by participating physicians.*

However, routine application of the criteria is selective and inconsistent. The most common approach reported for the current use is "For selected cases," which was chosen by 56.6% of practitioners. In contrast, only 29.3% of respondents stated they use the Rome IV criteria for "all cases." Furthermore, a notable portion of the respondents (14.1%) reported that they "Don't use it at all," suggesting that some practitioners have consciously discontinued frequent application of the criteria.

### *Gaps in knowledge of diagnostic timelines*

Despite the high general awareness, the survey revealed gaps in knowledge concerning the specific temporal requirements fundamental to the Rome IV diagnosis. Regarding the perceived proportion of patients eligible for application of the Rome criteria, most physicians selected 25%-50% of patients ($n$ = 40), followed by "I don't know" ($n$ = 27), >50% ($n$ = 22), and <25% ($n$ = 10) (Figure 1). When asked about the required duration for criteria application, approximately one-fifth of respondents answered "I don't know" for both the

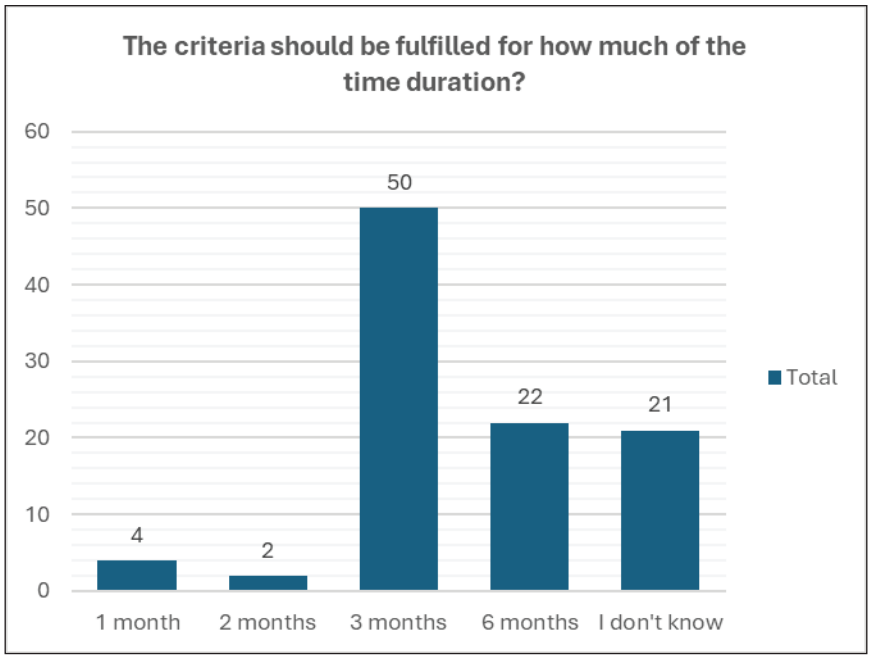


***Figure 2.*** *Physicians' knowledge of the required duration for fulfilling the Rome IV diagnostic criteria.*

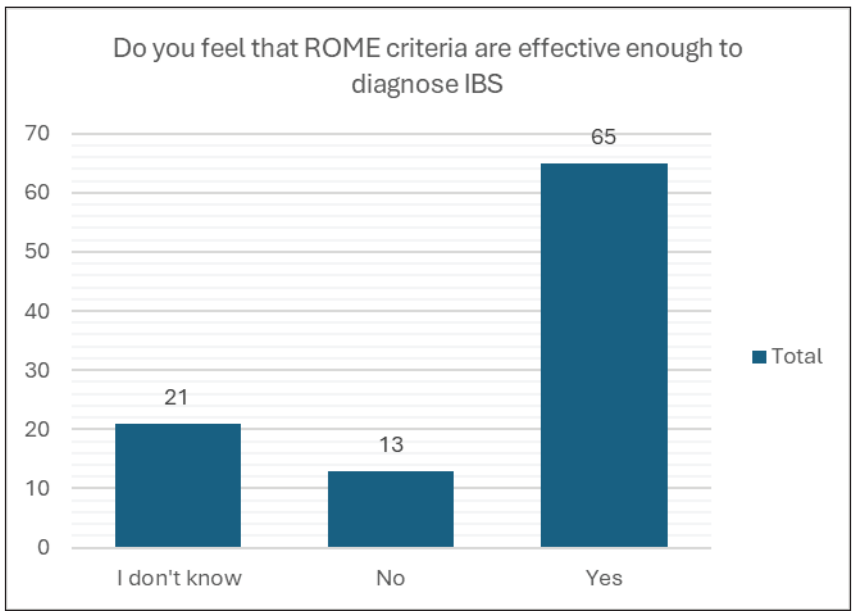


***Figure 3.*** *Physicians' perceptions of the effectiveness of the Rome IV criteria for diagnosing IBS.*

duration of criteria fulfillment (21.2%) and the duration of symptom onset (22.2%). Specifically, regarding the duration for which the criteria should be fulfilled ($n$ = 99), half of the respondents (50) correctly identified "3 months." However, 22 respondents (22.2%) chose "6 months," highlighting a potential area of confusion between the two required temporal criteria (Figure 2). For the necessary symptom-onset duration required to apply the criteria ($n$ = 97), the majority of respondents selected ">6 months" (53 responses, with an additional 13 selecting ">6 months" in the structured data).

### *Perception of effectiveness and continuity of care*

Regarding the perceived value of the guidelines, a majority of practitioners (65.7%) affirmed that the Rome criteria are effective for diagnosing IBS (Figure 3). However, maintaining consistent long-term management was reported to be challenging. A majority of respondents (69.7%) indicated they are "Sometimes" able to achieve continuity of care for patients with IBS, while 26.3% reported "always" achieving it, 3.0% rarely, and 1.0% never (Figure 4). This challenge in consistent management is reflected in specialist referral patterns that appear reactive. Referral to a specialist is predominantly triggered by the "Development of complication" (61.6%) or by the patient being classified as a "Long duration patient" (30.3%).

### *Association between years of experience and knowledge of the Rome IV diagnostic timeline*

The association between years of clinical experience and knowledge of the correct duration for fulfilling the Rome IV criteria was assessed using Fisher's exact test. No statistically significant association was identified ($p$ = 0.336). Across all experience groups, the majority of physicians correctly identified 3 months as the required duration (<3 years: 58.5%; 3-5 years: 42.4%;>5 years: 48.0%). However, incorrect or uncertain responses were distributed similarly across groups, with 36.6% of physicians with less than 3 years, 57.6% of those with 3-5 years, and 52.0% of those with >5 years selecting an incorrect answer or reporting uncertainty, indicating

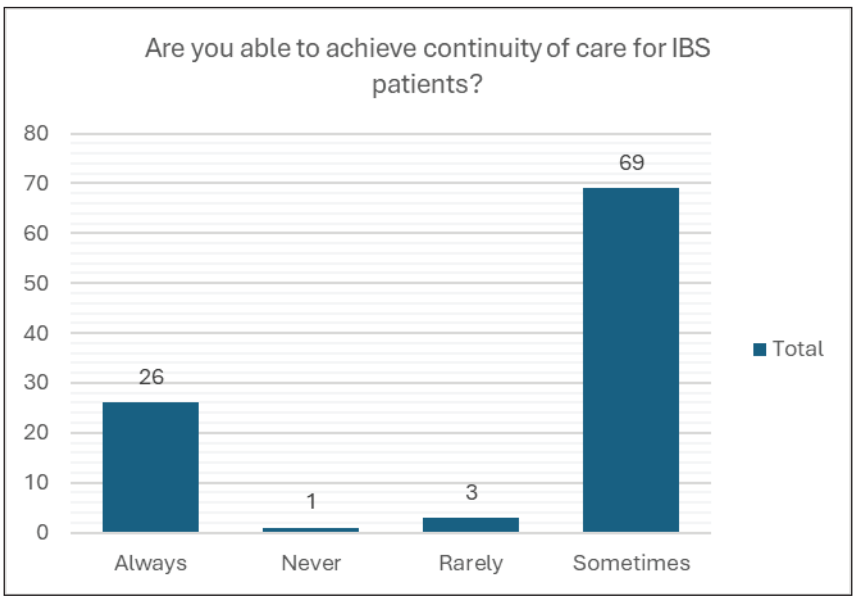


***Figure 4.*** *Reported continuity of care for patients with IBS.*

***Table 2.*** *Association between years of clinical experience and knowledge of the Rome IV diagnostic timeline.*

| | The criteria should be fulfilled for how much of the duration? | | | | | |
|---|---|---|---|---|---|---|
| **Years of practice** | **1 month** | **2 months** | **3 months** | **6 months** | **I don't know** | **Total** |
| <3 years | 2 | 0 | 24 | 6 | 9 | 41 |
| 3-5 years | 0 | 2 | 14 | 9 | 8 | 33 |
| >5 years | 2 | 0 | 12 | 7 | 4 | 25 |
| ***Total*** | 4 | 2 | 50 | 22 | 21 | 99 |

| | Value | df | *p* |
|---|---|---|---|
| $\chi^2$ | 9.65 | 8 | 0.291 |
| Fisher's exact test | | | 0.336 |
| N | 99 | | |

$\chi^2$, chi-square; df, degrees of freedom; *N*, sample size. A *p*-value <0.05 was considered statistically significant.

***Table 3.*** *Association between years of clinical experience and prior use of the Rome IV criteria.*

| | Have you ever used the Rome IV criteria to diagnose IBS? | | |
|---|---|---|---|
| **Years of practice** | **No** | **Yes** | **Total** |
| <3 years | 6 | 35 | 41 |
| 3-5 years | 3 | 30 | 33 |
| >5 years | 8 | 17 | 25 |
| ***Total*** | 17 | 82 | 99 |

| | Value | df | *p* |
|---|---|---|---|
| $\chi^2$ | 5.57 | 2 | 0.062 |
| Fisher's exact test | | | 0.084 |
| N | 99 | | |

IBS, irritable bowel syndrome; $\chi^2$, chi-square; df, degrees of freedom; *N*, sample size. A *p*-value <0.05 was considered statistically significant.

***Table 4.*** *Association between years of clinical experience and continuity of care for patients with IBS.*

| | Are you able to achieve continuity of care for IBS patients? | | | | |
|---|---|---|---|---|---|
| **Years of practice** | **Always** | **Never** | **Rarely** | **Sometimes** | **Total** |
| <3 years | 4 | 1 | 2 | 34 | 41 |
| 3-5 years | 14 | 0 | 0 | 19 | 33 |
| >5 years | 8 | 0 | 1 | 16 | 25 |
| ***Total*** | 26 | 1 | 3 | 69 | 99 |

| | Value | df | *p* |
|---|---|---|---|
| $\chi^2$ | 12.6 | 6 | 0.049 |
| Fisher's exact test | | | 0.010 |
| N | 99 | | |

IBS, irritable bowel syndrome; $\chi^2$, chi-square; df, degrees of freedom; N, sample size. A *p*-value <0.05 was considered statistically significant

that knowledge gaps regarding diagnostic timelines were consistent regardless of experience level (Table 2).

### *Association between years of experience and prior use of the Rome IV criteria*

The association between years of clinical experience and the prior use of the Rome IV criteria was assessed using Fisher's exact test. No statistically significant association was identified ($p = 0.084$). However, a notable trend was observed across groups, with physicians in the 3-5–year experience group reporting the highest rate of prior use (90.9%), compared to those with <3 years (85.4%) and >5 years of experience (68.0%) (Table 3). This trend suggests that more senior physicians may rely less on formal diagnostic criteria in routine clinical practice, though this difference did not reach statistical significance.

### *Association between years of experience and continuity of care*

The association between years of clinical experience and continuity of care for IBS patients was assessed using Fisher's exact test. A statistically significant association was identified ($p = 0.010$). Physicians in the 3-5-year experience group were most likely to report always achieving continuity of care (42.4%), compared with those with more than 5 years (32.0%) and less than 3 years (9.8%) of experience (Table 4). These findings suggest that early-career physicians face the greatest challenges in maintaining consistent long-term follow-up for patients with IBS, while mid-career physicians demonstrate comparatively stronger continuity of care practices.

## Discussion

This study evaluated the knowledge, attitudes, and practices of PHC physicians in Al-Ahsa regarding IBS and the application of Rome IV diagnostic criteria. Although the findings demonstrated a generally high level of awareness of IBS and the Rome IV criteria, important gaps remain in consistent use of these criteria and in understanding key diagnostic timelines, which may contribute to delayed diagnosis and inconsistent patient management. In this study, 89.9 % of the participants reported being familiar with the Rome IV criteria, which was comparable to that reported in Riyadh (86%) [7], and notably higher than those reported in Jazan (78%) [6] and Khalil et al. [8] study (66%). This finding is encouraging and may reflect the increasing emphasis on evidence-based practice and postgraduate training in family medicine and primary care in Al-Ahsa. As mentioned, a high level of awareness does not necessarily imply consistent application of the Rome IV criteria. That is why most physicians in Al-Ahsa (82.8%) had previously used the criteria; however, only a minority (29.3%) reported applying them to all suspected cases, with the majority (56.6%) reserving them for selected cases. Similar findings have been reported in studies from other regions of Saudi Arabia and internationally, where most physicians were aware of IBS diagnostic criteria but demonstrated variability in practical application [9,10]. Two studies conducted in Riyadh [7] and Jizan [6] Provinces demonstrated that 68.7% and 76% of physicians had ever used the Rome IV criteria, respectively. Significant knowledge gaps about the timing requirements of the Rome IV criteria were also evident. Half of the respondents (50.5%) correctly identified 3 months as the required duration for fulfilling the Rome IV criteria. However, 22.2% selected 6 months, suggesting possible confusion between the two diagnostic timeline requirements. This result was slightly higher than that reported in the Riyadh-based study by Al-Shamrani et al. [7], in which 41.1% of physicians recognized that the criteria should be fulfilled for 3 months. Similarly, a national Saudi study by Khalil et al. [8] reported that (40.1%) of physicians correctly identified the 3-month fulfillment period.

This distinction is clinically important, as misinterpretation may lead to premature diagnosis or unnecessary referral. Most participants (65.7%) considered the Rome IV criteria effective for diagnosing IBS. This proportion was higher than that reported in the Riyadh-based study by Al-Shamrani et al. (56.1%) [7] and the national Saudi study by Khalil et al. (49.8%) [8], but slightly lower than the approximately 70% reported by Abusageah et al. in Jazan [6]. These findings indicate that physicians generally have confidence in the diagnostic utility of the

Rome IV criteria. However, this favorable perception does not appear to translate consistently into routine clinical practice or comprehensive longitudinal management. The continuity of care is clinically significant given that IBS is a chronic, relapsing condition in which sustained physician-patient relationships are central to symptom monitoring and treatment adjustment [11,12]. Based on the study's questionnaire, the majority of respondents (69.7%) reported being only "sometimes" able to achieve continuity of care for IBS patients, while 26.3% reported "always" achieving it. The "always" response in our study was higher than that reported in the Riyadh-based study by Al-Shamrani et al. [7] (12.6%) and close to the national Saudi study by Khalil et al. [8] (27.9%), but lower than that reported in the Jazan study by Abusageah et al. [6] (44%). The frequency of the occasional response indicates that ensuring regular follow-up for IBS patients remains challenging in primary care practice [13]. Referral practices were largely reactive, with most physicians referring patients only after complications or prolonged disease duration [14,15], suggesting delayed specialist involvement, diagnostic uncertainty, or limited referral accessibility [16,17]. The predominance of younger physicians and residents may also have influenced the findings, as physician qualification has been associated with attitudes toward IBS in Saudi PHC settings [18]. To further explore these patterns, the association between years of clinical experience and key practice variables was formally assessed. This study found no significant association between years of clinical experience and knowledge of the correct duration required to fulfill the Rome IV criteria ($p = 0.336$), indicating no statistically significant difference across career stages. This finding is consistent with the Riyadh-based study by Al-Shamrani et al. ($p>0.05$) [7] and the Jazan study by Abusageah et al.($p = 0.072$).[6]. Previous Saudi studies reported variable overall prior use of the Rome IV criteria among PHC physicians [6-8], but did not clearly examine prior use by years of experience. In our study, prior use was not significantly associated with experience ($p = 0.084$). Despite physicians with over 5 years of experience reporting the lowest incidence of past use of the Rome IV criteria, this may indicate a significant reliance on clinical judgment and should be regarded with caution, given the lack of statistical significance. Previous Saudi studies also reported inconsistent continuity of care among PHC physicians managing IBS [6-8], but they did not clearly examine this outcome by years of clinical experience. In our study, continuity of care differed significantly by experience level ($p = 0.010$), mainly in the "always" category, which was highest among physicians with 3-5 years of experience and lowest among those with <3 years. This may reflect lower clinical confidence, limited autonomy, clinic rotation, and less experience with long-term IBS management among early-career physicians, while mid-career physicians may have both recent guideline exposure and greater practical confidence. This interpretation remains exploratory. This study has several limitations. The calculated minimum sample size was 198 participants; however, only 99 physicians completed the questionnaire, representing approximately 50% of the target sample. Therefore, the study was underpowered, and the findings should be interpreted cautiously, particularly the non-significant associations. The low recruitment rate may also introduce non-response bias. The use of a self-administered questionnaire may introduce response bias and may not fully reflect actual clinical practice. Furthermore, the cross-sectional design prevents assessment of causality between physician characteristics and practice patterns. Despite these limitations, this study provides preliminary regional data on IBS-related practices among PHC physicians in Al-Ahsa.

## Conclusion

This study provides preliminary regional insight into PHC physicians' knowledge, attitudes, and practices regarding IBS and the Rome IV diagnostic criteria in Al-Ahsa. Although most physicians were familiar with IBS and the Rome IV criteria, this awareness was not consistently reflected in routine clinical application or continuity of care. Gaps in understanding diagnostic timelines and variability in the use of the Rome IV criteria may contribute to inconsistent IBS diagnosis and management in primary care. The lower continuity of care observed among early-career physicians may be related to limited clinical confidence, lower autonomy, frequent clinical rotation, or less experience in managing chronic functional gastrointestinal disorders over time. Given the underpowered sample and possible non-response bias, these findings should be interpreted with caution. Larger, adequately powered studies are needed to confirm these results and to assess whether targeted continuing medical education and structured follow-up pathways can improve IBS care in primary healthcare settings.

### List of Abbreviations

| | |
|---|---|
| GP | General practitioner |
| IBS | Irritable bowel syndrome |
| KAP | Knowledge, attitudes, and practices |

### Conflict of interest

The authors declare that they have no conflict of interest regarding the publication of this article.

### Consent to participate

Electronic informed consent was obtained from all participants before participation in the study.

### Ethical approval

The study was approved by the King Faisal University Research Ethics Committee, Saudi Arabia (grant no. KFU-REC-2025MAY-ETHICS3453, approval date: 28 May 2025).


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This research received no external funding.


### Author contributions

Study concept and design: Mohammed Al-Alwan. Data acquisition: Qusai Alobaid, Hassan Almubarak, Hassan Alsulaiman, Alhassan Bujubarah, and Abbas Almusawi. Data analysis and interpretation: Qusai Alobaid. Manuscript preparation: Hussain Alsemaeel, Hassan Alsulaiman, and Mohammed Alessa. Manuscript editing and review: Mohammed Alamer, Ali Alnahwi, Kumail Al Abdullah, Hassan Alsulaiman, and Mohammed Alessa. Supervision: Mohammed Alessa.

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*Supplementary content (If any) is available online.*

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