J. Fac. Pharm. Ankara / Ankara Ecz. Fak. Derg., 50(2): 255-264, 2026
Doi: 10.33483/jfpau.1817598
Research Article / Araştırma Makalesi

DEVELOPING AND EVALUATING AN INTEGRATED ANTIMICROBIAL STEWARDSHIP AND INFECTION PREVENTION AND CONTROL TRAINING PROGRAM FOR PRIMARY CARE PHYSICIANS IN TÜRKİYE: A PILOT STUDY

TÜRKİYE'DE BİRİNCİ BASAMAK HEKİMLERİ İÇİN ENTEGRE ANTİMİKROBİYAL YÖNETİM VE ENFEKSİYON ÖNLEME VE KONTROL EĞİTİM PROGRAMININ GELİŞTİRİLMESİ VE DEĞERLENDİRİLMESİ: BİR PİLOT ÇALIŞMA

Melda KEÇİK[1]*, Muammer ÇELİK[2], Ekrem BAŞARA[3], Can Hüseyin HEKİMOĞLU[4], F. Nur BARAK AKSAKAL[1]

[1]Gazi University, Institute of Health Sciences, Department of Public Health, Ankara, Türkiye
[2]Dokuz Eylül University, Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology, İzmir, Türkiye
[3]Gülhane Training and Research Hospital, Department of Family Medicine, Ankara, Türkiye
[4]Ministry of Health, General Directorate of Public Health, Ankara, Türkiye

ABSTRACT

Objective: *This study aimed to develop and evaluate the effectiveness of a structured training program integrating antimicrobial stewardship (AMS) and infection prevention and control (IPC) for primary care physicians.*
Material and Method: *We developed a structured AMS–IPC training program for primary care physicians. The program was conducted in Ankara, Türkiye with 34 participants, and knowledge level of each participant was assessed using a pre-test, a post-test, and a follow-up test conducted three months after the training.*
Result and Discussion: *The mean pre-test score was 9.91 out of a maximum of 18 points, which increased to 14.74 out of 18 in the post-test, indicating a statistically significant improvement. ($p<0.001$). The mean score at the three-month follow-up was 13.1, demonstrating that most of the knowledge gained was retained ($p<0.001$). The findings demonstrate that integrated AMS and IPC training programs at the primary care level result in significant and sustained knowledge gains and serve as an effective capacity-building tool in combating AMR.*
Keywords: *Antimicrobial stewardship, infection prevention and control, primary healthcare services, training*

ÖZ

Amaç: *Bu çalışma, birinci basamak hekimlerine yönelik antimikrobiyal yönetim (AMY) ve enfeksiyon önleme ve kontrolün (EÖK) entegre edildiği yapılandırılmış bir eğitim programı geliştirmeyi ve etkililiğini değerlendirmeyi amaçladı.*
Gereç ve Yöntem: *Birinci basamak hekimleri için yapılandırılmış bir AMY–EÖK eğitim programı*

* **Corresponding author:** Melda Keçik
E-mail: meldaciba@gmail.com
Submitted date: 05.11.2025 **Accepted date:** 02.12.2025 **Published date:** 19.05.2026
Citation: Keçik, M., Çelik, M., Başara, E., Hekimolu, C.H., Barak Aksakal, F.N. (2026). Developing and evaluating an integrated antimicrobial stewardship and infection prevention and control training program for primary care physicians in Türkiye: A pilot study. Journal of Faculty of Pharmacy of Ankara University, 50(2), 255-264.

geliştirildi. Program, Ankara, Türkiye'de 34 katılımcı ile yürütüldü; her katılımcının bilgi düzeyi eğitim öncesi test, eğitim sonrası test ve eğitimden üç ay sonra uygulanan izlem testi ile değerlendirildi.

Sonuç ve Tartışma: *Eğitim öncesi ortalama puan 18 üzerinden 9.91 iken, eğitim sonrası 14.74'e yükseldi ve bu artış istatistiksel olarak anlamlıydı ($p < 0.001$). Üçüncü ay izlem ortalama puanı 13.1 olup, kazanılan bilginin büyük ölçüde korunduğunu göstermektedir ($p < 0.001$). Bulgular, birinci basamak düzeyinde entegre AMY ve EÖK eğitimlerinin anlamlı ve kalıcı bilgi artışı sağladığını ve antimikrobiyal dirençle (AMR) mücadelede etkili bir kapasite geliştirme aracı olarak işlev gördüğünü göstermektedir.*

Anahtar Kelimeler: *Antimikrobiyal yönetim, birinci basamak sağlık hizmetleri, eğitim, enfeksiyon önleme ve kontrol*

INTRODUCTION

Antimicrobial resistance (AMR) is recognized as one of the most critical global public health threats of our time. The World Health Organization (WHO) has described AMR as a "silent pandemic," warning that if not effectively addressed, it will restrict treatment options, increase morbidity and mortality, and impose a substantial economic burden on healthcare systems [1]. Inappropriate and unnecessary use of antimicrobials is a key driver of AMR, and such prescribing practices are widespread in primary healthcare settings, where most antibiotic prescriptions are issued [2,3].

Primary care physicians, as the first point of contact within the healthcare system, play a critical role in the early diagnosis and management of infections. However, the literature consistently reports variability in their knowledge and practices regarding both infection prevention and control (IPC) and antimicrobial stewardship (AMS), with educational needs remaining largely unmet [4]. In addition to promoting the rational use of antimicrobial agents, infection prevention represents a key strategy in combating AMR. The WHO highlights that IPC practices—such as hand hygiene (HH), the use of personal protective equipment, and environmental cleaning in healthcare facilities—are effective in breaking the chain of infection and preventing healthcare-associated infections [5]. However, evidence suggests that adherence to IPC measures remains low in primary healthcare settings, with persistent deficiencies at both infrastructural and behavioral levels [6,7].

As recommended by the WHO, IPC and AMS strategies should be addressed together in order to prevent infections and promote rational antibiotic use in healthcare systems [5]. While AMS programs have been successfully implemented in hospitals, their reach in primary care has been limited, despite evidence showing that 80–90% of all antibiotic use occurs in outpatient settings [8]. Likewise, adherence to IPC practices in primary care remains low, with persistent infrastructural and behavioral gaps.

Structured training programs that integrate AMS and IPC are urgently needed at the primary care level. Nevertheless, to date, no integrated educational model specifically designed for primary care physicians has been described in the literature [9]. Addressing this gap is critical to strengthening both rational antimicrobial use and infection prevention in the community.

This study aimed to develop, implement, and evaluate a pilot training program for primary care physicians that integrates AMS and IPC principles. The specific objectives were:

1. To design an evidence-based and practice-oriented training curriculum tailored to the needs of primary care physicians.
2. To assess the immediate and mid-term effects of the training program on participants' knowledge of AMR, AMS, and IPC.
3. To evaluate participant satisfaction with the content, delivery, and applicability of the training program.
4. To identify areas for improvement in future training initiatives targeting primary care physicians.

MATERIAL AND METHOD

This study was designed as a pre-test/post-test intervention to evaluate the effectiveness of a classroom-based, interactive training program on AMS and IPC for primary care physicians. A delayed post-test was conducted three months after the training to assess knowledge retention. The study was

implemented in collaboration with the Ankara Family Medicine Association (ANKAHED). Written informed consent was obtained from all participants, and data were anonymized for analysis.

A general needs assessment was conducted through an extensive literature review on AMR, AMS, and IPC. International and national training programs were reviewed, including WHO's OpenWHO modules, but no integrated AMS–IPC program tailored for primary care physicians was identified. To further refine priorities, one-on-one interviews were held with international and national experts (Supplementary Appendix 1).

Based on expert input, the following topics were prioritized:

- Basic IPC practices (HH, personal protective equipment, environmental controls)
- AMS principles in the primary care setting
- AMS strategies for common community-acquired infections (urinary tract infections, acute tonsillopharyngitis, acute sinusitis) in primary care with case scenarios
- Multimodal strategies for IPC implementation in the primary care setting
- Communication strategies with patients and families to reduce unnecessary antibiotic use

The curriculum was developed by a multidisciplinary trainer group: an infectious diseases specialist with expertise in AMS, an epidemiologist/infectious diseases specialist with expertise in IPC, a family medicine specialist with primary care experience, public health pharmacist, and a public health specialist experienced in communication training. Draft slides were initially prepared using WHO and national guidelines, revised by trainers, cross-checked for accuracy, and finalized after eliminating redundancies.

The training program aimed to:

1. Provide participants with knowledge and skills to implement AMS strategies in daily practice.
2. Enhance IPC practices in family health centers.
3. Increase awareness of AMR and strengthen patient–family communication.
4. Provide supportive educational materials and tools.
5. Evaluate short- and mid-term retention of knowledge.

By the end of the training, participants were expected to:

- Explain AMR mechanisms and public health implications.
- Describe goals and principles of core IPC practices.
- Apply AMS strategies effectively through case scenarios.
- Implement IPC measures appropriately in family health centers.
- Use communication skills to discourage unnecessary antibiotic use.

Sample size was calculated assuming a 20% knowledge increase, 5% margin of error, 95% confidence level, and 80% power, resulting in a minimum required sample of 32 participants. To achieve this, the program was delivered over two consecutive days (January 11–12, 2025), with a maximum of 20 participants per day. Of 50 physicians who registered, 34 attended: 10 family physicians, 8 family medicine specialists, and 16 family medicine residents.

The training consisted of theoretical presentations, case discussions, group activities, brainstorming, and role plays. Each session lasted a full day and was held in ANKAHED's training facility. Trainers were provided with printed materials during the program, and participants received digital reference documents and slides after the 3-month follow-up test.

A 25-item questionnaire was developed with expert input. The first 7 questions assessed demographics, while the remaining 18 covered knowledge: 10 on IPC, and 8 on AMR &AMS. Unanswered questions were scored as incorrect. Multiple questions addressed multimodal IPC strategies and the WHO "5 Moments for HH" to reinforce key practices. The test was administered immediately before and after training, and again at 3 months via electronic survey. Scores were recorded out of a maximum of 18 points.

Participant feedback was collected using Mentimeter during the sessions, including 12 closed-ended questions (1-5 Likert scale) and 1 open-ended item. A debriefing meeting was also held with trainers and association representatives to identify areas for improvement.

Data from the pre-test, post-test, and 3-month follow-up tests were analyzed using SPSS Version 25.0 statistical software. Mean, standard deviation, median, minimum, and maximum values were

calculated for pre-test and post-test scores. Since the pre-test and post-test scores did not meet the assumptions for parametric testing, nonparametric methods were applied for comparisons. Differences between participants' median pre-test and post-test scores on the first and second training days were assessed using the Wilcoxon Signed Rank Test.

Although 34 participants attended the training, only 28 completed the 3-month follow-up test. Of these, one participant answered only a single question correctly; therefore, comparative dependent-group analyses at 3 months were conducted on 27 participants, matched using their individual codes. To evaluate the delayed effects of the training, Friedman's test was applied to compare pre-test, immediate post-test, and 3-month post-test scores. When significant differences were identified, post hoc analysis was performed using the Wilcoxon Signed Rank Test with Bonferroni correction to determine the source of the differences.

Additionally, score differences between the pre-test and post-test were calculated, and score increases were expressed as percentages [(pre-test – post-test / pre-test) × 100]. Item-level differences between pre-test and post-test results were also analyzed. The difference in the number of correct responses between the pre-test and the post-test was evaluated for each item. A difference of <0 was considered a negative effect, 1–3 was considered no effect, 4–9 was considered effective, and >10 was considered highly effective.

The statistical significance level (alpha) was set at 0.05.

RESULT AND DISCUSSION

A total of 34 participants attended the training, with 18 on the first day and 16 on the second day. Of the participants, 24 (70%) were women and 10 (30%) were men, with a mean age of 35.7 ± 8.5 years (median: 33, range: 26–57).

The median post-test scores on the first day, second day, and overall were significantly higher than the corresponding median pre-test scores ($p < 0.001$, $p < 0.001$, and $p < 0.001$, respectively; Wilcoxon Signed Rank Test). However, no statistically significant difference was observed between the pre-test and post-test medians when comparing the first and second training days ($p = 0.339$ and $p = 0.930$, respectively; Mann–Whitney U Test) (Table 1). Post-test scores increased by a mean of 4.8 (± 2.9) points, corresponding to a 31.9% (± 18.2) improvement compared to pre-test scores. Except for one participant (2.9%) whose score remained unchanged, all other participants (97.1%) showed an increase in their post-test scores.

Table 1. Comparison of median pre- and post-test scores for the first day, second day, and overall

	First Day (n=18)		Second Day (n=16)		Overall (n=34)	
	Pre-test	**Post-test**	**Pre-test**	**Post-test**	**Pre-test**	**Post-test**
Mean	10.39	14.72	9.38	14.75	9.91	14.74
Standard Deviation	2.50	2.63	3.284	2.62	2.896	2.586
Median	11*	15.5*	9.5*	15.5*	10*	15.5*
Min-max	6-16	9-18	3-15	10-18	3-16	9-18

*p<0.001

The impact of the training program on individual test items showed variation. Among the 18 questions, eight (44.4%) demonstrated a highly effective improvement, with more than 15 additional correct responses after the training. Five questions (27.8%) were found to be effective, showing an increase of 6 to 15 correct responses. Another four questions (22.2%) exhibited limited or no effect, with gains of five or fewer correct responses. Finally, one question (5.6%) revealed a negative effect, with a decrease of four correct responses (Table 2). Questions showing the highest improvement included:

- Use of personal protective equipment (+24),
- Multimodal strategy components (+20),

- Asymptomatic bacteriuria management (+20),
- Knowledge regarding the content of body fluid exposure risk (+17),
- Acute cystitis treatment (+16).

Table 2. Item-level pre- and post-test results with effectiveness classification of the training program

Question Number	Question Theme	First Day, Pre-/post-test Results (Difference)	Second Day, Pre-/post-test Results (Difference)	Total Difference	Effectiveness*
8	AMR as a global health issue	17/18 (+1)	16/16 (0)	+1	No effect
9	Alcohol-based hand rub use	8/17 (+9)	11/14 (+3)	+12	Highly effective
10	HH after exposure to body fluids	13/12 (-1)	11/13 (+2)	+1	No effect
11	Perception of the need for hand hygiene before patient contact	15/18 (+3)	12/14 (+2)	+5	Effective
12	Knowledge regarding the content of body fluid exposure risk	10/18 (+8)	5/14 (+9)	+17	Highly effective
13	HH indications after contact with the patient's environment	8/12 (+4)	6/12 (+6)	+10	Highly effective
14	Standard precautions	15/18 (+3)	12/15 (+3)	+6	Effective
15	Use of personal protective equipment	3/16 (+13)	3/14 (+11)	+24	Highly effective
16	Multimodal strategy components	7/18 (+11)	5/14 (+9)	+20	Highly effective
17	Implementation of multimodal strategies	18/16 (-2)	13/15 (+2)	0	No effect
18	Antimicrobial stewardship practices in primary care	3/8 (+5)	6/11 (+5)	+10	Highly effective
19	Antibiotic selection in acute cystitis	6/13 (+7)	3/12 (+9)	+16	Highly effective
20	Managing asymptomatic bacteriuria	1/12 (+11)	2/11 (+9)	+20	Highly effective
21	The most crucial reason for unnecessary or inappropriate antibiotic use in primary care	15/12 (-3)	13/12 (-1)	-4	Negative effect
22	Causative agents of acute sinusitis	12/15 (+3)	9/12 (+3)	+6	Effective
23	Calculating the modified Centor score	10/11 (+1)	7/11 (+4)	+5	Effective
24	Managing tonsillopharyngitis	11/14 (+3)	4/10 (+6)	+9	Effective
25	Perception of multimodal strategy components	15/17 (+2)	15/16 (+1)	+3	No effect

* <0: Negative effect, 0-5: No effect, 6-15: Effective, >15: Highly effective

Comparison of pre-test, immediate post-test, and 3-month follow-up scores with Friedman's test showed a statistically significant difference across the three time points ($p < 0.001$). Post hoc analysis (Wilcoxon Signed Rank Test with Bonferroni correction) revealed significant differences between the post-test and pre-test ($p < 0.001$), and between the 3-month test and pre-test ($p < 0.001$). A significant difference was also observed between the immediate post-test and the 3-month follow-up ($p = 0.012$). Therefore, median scores increased significantly after the training, with some decline at 3 months, while remaining higher than baseline (Figure 1).

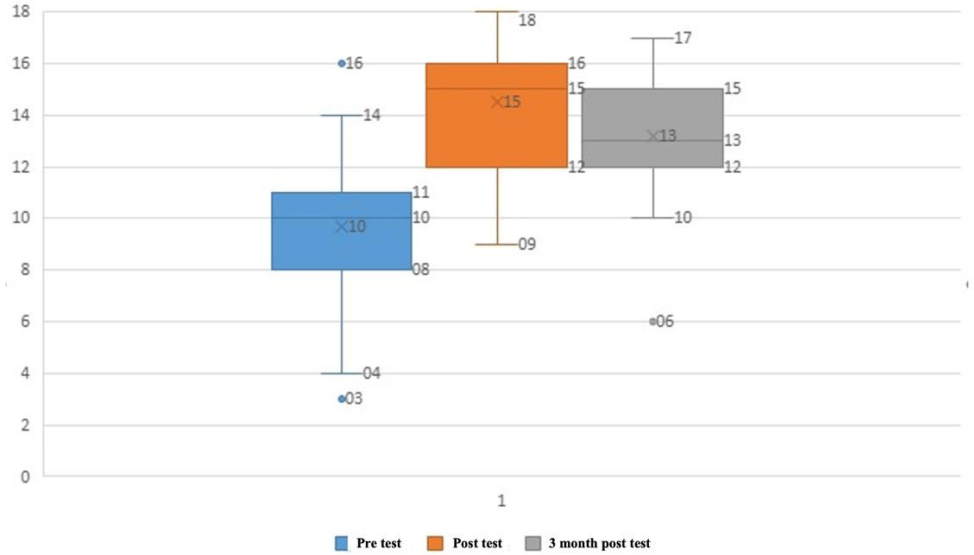


Figure 1. Distribution of knowledge test scores at baseline, immediately after training, and at 3-month follow-up

Individual participant scores across pre-test, post-test, and 3-month follow-up has been represented in Figure 2. Each line represents one participant's score progression over time. Almost all participants demonstrated an increase from pre-test to immediate post-test, with some decline at the 3-month follow-up. Nevertheless, most participants retained higher scores compared to baseline, indicating sustained though partially attenuated knowledge gains.

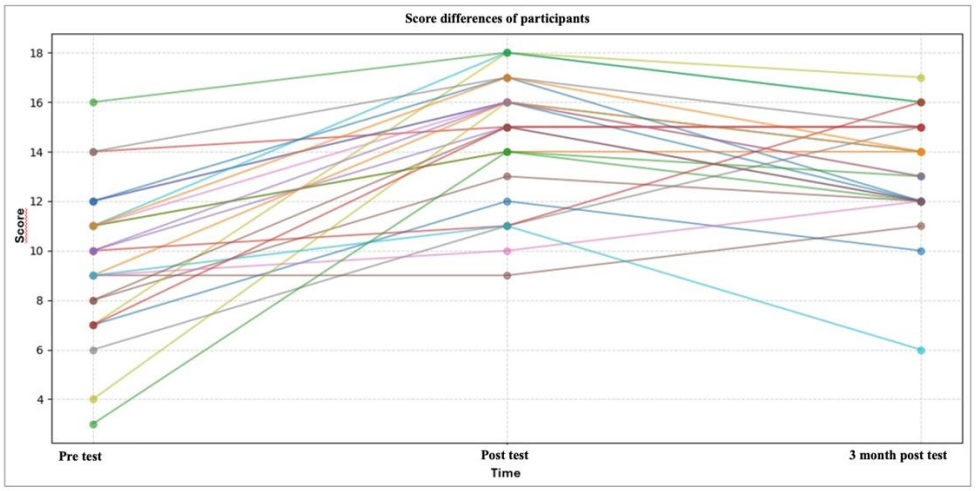


Figure 2. Individual participant scores across pre-test, post-test, and 3-month follow-up

No significant difference was observed in pre-test scores between family medicine specialists and other physicians (p=0.975). Post-test scores were significantly higher among family medicine specialists (p=0.030). At the 3-month follow-up, no significant difference was found between the groups (p=0.229).

Feedback indicated that the training program was generally well received, with most objectives achieved and content aligned with participants' expectations. Both theoretical and practical components were described as relevant, up-to-date, and applicable to clinical practice. Nearly all participants rated trainers' expertise and presentation skills very positively (Table 3).

While training materials were generally considered sufficient, about one-third of participants

suggested providing additional resources, particularly more detailed content with case studies. Regarding time management, 69% were satisfied, whereas 31% reported that the time allocated for interactive sessions and case discussions was insufficient.

Table 3. Distribution of high scores (4–5) for training program evaluation parameters

Parameter	% of High Scores (4–5)
Achievement of training objectives	81%
Relevance of content to the topic	~88% ("5")
Relation of training to past/future activities	~85% ("4–5")
Implementation of the training	~85% ("4–5")
Professional competence of trainers	~100% ("4–5")
Pre-training knowledge assessment	~84% ("4–5")
Post-training knowledge assessment	~96% ("4–5")
Informational materials provided	~65% ("4–5")
Time allocated to training activities	~69% ("4–5")
Training venue (facility and technical setup)	~100% ("4–5")
Meals and other services	~96% ("4–5")

Of the 22 open-ended responses, 12 were expressions of gratitude and 10 included constructive suggestions. Common themes were the need for more efficient use of time, greater interactivity, and expanded content on antibiotic selection. Participants also suggested more detailed discussion of clinical cases, reducing repetition in workshops, incorporating communication strategies for difficult patient encounters, and providing more regular breaks (Table 4).

Table 4. Thematic analysis of open-ended participant feedback on the training program (n = 22)

Theme	Frequency (n)	% of Responses
Gratitude / positive comments	12	54.5%
More detailed content on antibiotic selection	4	18.2%
Need for greater interactivity / shorter sessions	3	13.6%
More detailed clinical case discussions	3	13.6%
Reduce repetition in workshops	2	9.1%
Strategies for difficult patient–physician communication	1	4.5%
Regular breaks to maintain attention	1	4.5%

In this pilot study, we developed and evaluated an integrated training program that combines AMS and IPC for primary care physicians. The intervention produced a substantial immediate gain in knowledge with partial attenuation at three months, yet scores remained significantly above baseline. Item-level analyses showed the largest improvements in domains central to day-to-day practice—appropriate use of personal protective equipment, multimodal IPC strategies, exposure to body fluids, and antibiotic selection for common infections (e.g., acute cystitis, asymptomatic bacteriuria). These patterns suggest that the curriculum not only increased general awareness but also addressed practical decision points that commonly drive inappropriate antimicrobial use.

Education and training are recognized as core elements of AMS programs [10]. Knowledge of and approaches to AMS vary widely between countries and even within the same country, underscoring the need for standardized training initiatives that enable shared learning and support the development of effective programs. The European Society for Clinical Microbiology and Infectious Diseases (ESCMID) has implemented a structured AMS training curriculum to expand the number of antimicrobial stewards

and facilitate the successful implementation of AMS across healthcare systems [11]. Previous studies have shown that structured training in primary care can raise clinician awareness, improve knowledge, and promote rational antibiotic use, thereby contributing to the fight against AMR [12-14]. In our program, participants first received theoretical education on the fundamentals of AMS strategies in primary care, followed by case-based exercises on community-acquired urinary tract infections, acute tonsillitis, and acute sinusitis. Of the seven AMS-related knowledge questions in the pre- and post-test, improvements were observed in six questions, while one item—already answered correctly by most participants at baseline—remained unchanged. These findings confirm that the training was effective in strengthening AMS competencies in primary care physicians. Similarly, a nationwide AMS program in Türkiye combining primary care physician training, prescribing surveillance with feedback, and community campaigns has demonstrated a reduction in antibiotic prescriptions, underscoring the value of education as part of comprehensive AMS interventions [15]. In a study from Canada, the primary care physicians expressed strong interest in further educational opportunities, including seminars, workshops, and online learning, to strengthen their knowledge and capacity in AMS [12].

In this pilot study, we provided training on the basic concepts of IPC in primary care, including HH, personal protective equipment (PPE), and other standard precautions. The program also covered the use of multimodal strategies for effective IPC implementation, followed by group-based brainstorming sessions in which participants developed multimodal strategy plans for dedicated IPC activities. Pre-test results highlighted important knowledge gaps, particularly regarding basic IPC concepts among primary care physicians. After the training, knowledge levels improved in eight out of ten IPC-related questions, with the largest gains observed in the use of PPE, understanding multimodal strategies, alcohol-based hand rub use, and awareness of body fluid exposure risks. While a structured national IPC program has been in place in all hospitals in Türkiye since 2005—contributing to reductions in healthcare-associated infections—no equivalent program currently exists for primary care [16]. In line with WHO recommendations, the establishment of IPC programs in primary healthcare centers is therefore urgently needed, and our findings suggest that structured, practice-oriented training could play a key role in closing this gap [17].

Previous studies have shown the importance of implementing AMS and IPC strategies together to reduce healthcare-associated infections (HAIs) and AMR. However, most of this evidence comes from hospital settings, and there is a lack of data evaluating integrated AMS–IPC approaches in primary care. Baur et al. reported that combining HH interventions with AMS programs achieved a 66% reduction in antimicrobial-resistant bacteria, compared with only 17% in AMS programs without HH interventions [18]. Similarly, a systematic review and meta-analysis from Asia demonstrated that AMS programs integrating HH were associated with significant reductions in HAIs. These findings emphasize that tailoring educational strategies to address both IPC and AMS simultaneously is a key enabler for creating synergistic outcomes [19]. Despite this, medical education still faces significant gaps in infectious diseases and AMS training, with suboptimal infection prevention practices, limited exposure to clinical rotations, and no standardized curricula [20]. The findings of Mbamalu et al. further highlight the need for targeted training and context-specific IPC–AMS interventions to close these gaps and strengthen preparedness, especially during public health emergencies [21]. Our training program contributes to filling this gap by providing a structured, integrated AMS–IPC model specifically designed for primary care physicians.

In this study, the high acceptability ratings and positive feedback suggest that a blended format—combining theoretical presentations with case discussions, group work, and role play—effectively meets the learning needs of family physicians. At the same time, participants requested more time for clinical cases and antibiotic selection, consistent with evidence that interactive, case-based methods and communication skills training are more likely to translate knowledge into sustained behavior change. However, challenges remain in the training of primary care physicians. One of the most prominent issues is the low participation of physicians in such programs [22]. A recent qualitative study identified both facilitators and barriers affecting the uptake of educational interventions by general practitioners. Facilitators included flexible and relevant learning strategies, easy access to information, resources and reminders, and raising awareness about AMR. The main barriers were time pressure, largely driven by high patient volumes [23]. Addressing these barriers through flexible delivery models, integration of

digital learning tools, and institutional support will be critical for scaling up AMS–IPC training in primary care.

This study also highlights gaps that future iterations should address. First, while knowledge improved and was largely retained, we did not measure clinical behaviors (e.g., prescribing patterns, hand-hygiene compliance) or patient outcomes. Linking education to routine data (antibiotic consumption, diagnosis-specific prescribing quality indicators), simple IPC audits, or standardized patient scenarios would permit a more definitive assessment of real-world impact. Second, although our sample size met the a priori target for detecting knowledge change, it was drawn from one metropolitan area and may not represent physicians practicing in rural or resource-limited settings. Third, the three-month horizon captures only early retention; longer follow-up with booster activities (e.g., quarterly case conferences, short e-learning refreshers, and audit-and-feedback dashboards) is warranted. Finally, item-level results suggest that a few questions may have been ambiguously worded or mismatched to participants' baseline scope; revising these items and enriching them with visuals or clinical vignettes should sharpen both teaching and measurement.

Notwithstanding these limitations, the study offers several strengths. To our knowledge, it is among the first primary-care-focused programs in Türkiye to deliver AMS and IPC as an integrated, practice-oriented curriculum. Effectiveness was assessed at multiple time points using matched analyses, and item-level performance provided actionable signals to refine content. The curriculum was built on WHO and national guidance, ensuring consistency with international standards while remaining locally relevant.

In summary, an integrated AMS-IPC curriculum for primary care physicians was feasible, well-received, and associated with significant and largely sustained gains in knowledge, particularly in high-impact practical domains. With iterative refinement and linkage to audit and feedback, the program has strong potential as a scalable capacity-building tool to curb unnecessary antibiotic use and strengthen IPC practices in the primary care—two cornerstones of national and global efforts to confront AMR.

AUTHOR CONTRIBUTIONS

Concept: M.K., M.Ç., E.B., C.H.H., F.N.B.A.; Design: M.K., M.Ç., E.B., C.H.H., F.N.B.A.; Control: C.H.H., F.N.B.A.; Sources: M.K., M.Ç., E.B., C.H.H., Materials: M.K., M.Ç., E.B., C.H.H.; Data Collection and/or Processing: M.K., M.Ç., C.H.H.; Analysis and/or Interpretation: C.H.H., F.N.B.A.; Literature Review: M.K., M.Ç., E.B.; Manuscript Writing: M.K., M.Ç.; Critical Review: C.H.H., F.N.B.A.; Other: -

CONFLICT OF INTEREST

The authors declare that there is no real, potential, or perceived conflict of interest for this article.

ETHICS COMMITTEE APPROVAL

Ethical approval for this study was obtained from the Ethics Committee of Gazi University on July 24, 2024 (Approval No. E.1001850).

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