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Attitudinal Changes Toward Using Arabic in Medical Terminology: A Cross-Sectional Study from Jordan

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ABSTRACT

This study explored shifts in awareness, attitudes, acceptance, and perceived obstacles related to the use of Arabicized medical terminology in instruction and everyday communication within Jordanian medical colleges. A cross-sectional online survey was administered to medical students and faculty members at universities across Jordan to assess their awareness, attitudes, and perceived barriers regarding Arabicized medical terms. Survey responses were converted into awareness, attitude, and barrier scores, which were then analyzed in relation to the participants' sociodemographic characteristics. The findings revealed that medical students generally demonstrated positive awareness, acceptance, and attitudes toward using Arabicized medical terminology. The most frequently reported barriers among students included the predominance of English in teaching and assessment (exams, quizzes, assignments, etc.) and the scarcity of high-quality medical references written in Arabic. Several demographic factors—such as gender, income level, place of residence, year of study, having more than one native language, and overall language proficiency—were significantly associated with students' acceptance, attitudes, and perceived barriers. Medical faculty members also exhibited adequate awareness and largely favorable attitudes toward Arabicized terminology. Their most commonly identified barriers aligned closely with those reported by students, reinforcing the credibility of these challenges. Among professors, gender and English language proficiency were the only variables associated with acceptance, attitudes, and perceived barriers. In summary, the study highlights an increasingly supportive environment for integrating Arabicized medical terminology, especially when the major challenges confronting both students and professors are clearly recognized.

Keywords: Arabicization, Medical terms, Medicine, Language planning, Awareness, Attitudes

Introduction

Over recent decades, the preference for English medical terminology over Arabic equivalents has become increasingly common across several Arabic-speaking countries in the Middle East—including Jordan, Egypt, and Saudi Arabia—particularly within medical schools and academic contexts [1-4]. In contrast, other countries such as Syria continue to teach medicine comprehensively in Arabic [5, 6]. Parallel to this trend, many academic institutions in the Arab world have made substantial efforts to promote the use of Arabic in higher education, especially in scientific and medical disciplines, through the Arabicization of technical and medical vocabulary.

The term *Arabicization* has been defined in various ways. According to Al-Jawhari [7], the verb *taʿarrab* ("to Arabicize") can refer to becoming similar to Arabs or adopting Arabic speech patterns. In this sense, a foreign name becomes "Arabicized" when pronounced in accordance with Arabic linguistic norms. Thus, Arabicization is derived from "Arabic," the language of the Arabs, and the verb "to Arabicize" refers to transferring an item into Arabic [8, 9]. Another definition describes Arabicization as the adoption of a non-Arabic word and its modification or translation to make it clear and suitable for Arabic-speaking communities [10, 11]. Al-Abed Al-Haq [8] also distinguished between *Arabicization* and *Arabization*: while Arabization relates to Arab culture and

identity, Arabicization concerns lexical matters in the Arabic language. In his view, Arabicization plays a vital role in protecting the Arabic language from decline.

Arab scholars have extensively examined attitudes toward Arabicizing medical education and terminology. Many studies report a prevailing preference for Arabicization across Arab countries. For instance, in Egypt, more than half of the surveyed medical students did not view English as an obstacle; 44.4% routinely translated English medical terms into Arabic for better understanding, while 44.5% of faculty members felt that English-medium instruction hindered their teaching [4]. In Saudi Arabia, students similarly expressed positive attitudes toward Arabicization and preferred instruction in Arabic [1]. Another Saudi study identified several challenges to Arabicization, particularly the inconsistent quality of translations and the use of vague or non-expressive Arabic equivalents by inexperienced translators [12]. Additional research showed that both dental and medical students favored Arabic-medium instruction, believing it enhances comprehension; 41% considered English a learning barrier, while only 9.9% disagreed [13]. Despite these preferences, Saudi policymakers reportedly favored English for medical training, largely due to concerns about resource availability, though many supported developing an Arabic curriculum once obstacles are addressed [2].

Elsewhere, a study among pre-medical and first-year medical students in Qatar found widespread support for English–Arabic glossaries, with many students occasionally translating scientific terms into Arabic [14]. Notably, 61% of students avoided asking about unfamiliar English medical terms due to shyness. Two comparative studies by Al-Asal and Smadi [15, 16] examined medical education at the University of Damascus (Syria) and Jordan University of Science and Technology (Jordan), concluding that limited language proficiency—particularly in the foreign language—impeded students' ability to acquire scientific terminology. Drawing on the success of the Syrian model of Arabic medical instruction [17, 18], many scholars have argued that Arabic is fully capable of accommodating new scientific terms, especially given the presence of numerous dormant Arabic expressions that could serve as appropriate equivalents.

Earlier findings from Jordan, however, suggested low acceptance of Arabicization. A study conducted in 2000 [19] reported that Jordanian physicians had serious reservations about Arabicized terminology and were not ready or motivated to adopt it. Similarly, research from Egypt indicated that academic staff believed Arabicization would reduce graduates' competitiveness in global markets [4]. More recently, a Saudi-based study reaffirmed policymakers' support for English in medical instruction, citing limited Arabic-language medical resources as a primary obstacle, though respondents expressed willingness to adopt Arabic instruction in the future [2].

The present study reexamines the situation in Jordan to determine whether awareness, acceptance, attitudes, and perceived barriers toward Arabicized medical terms among university professors and students have evolved. It was hypothesized that societal shifts may have produced more favorable attitudes toward Arabic and greater acceptance of Arabicized medical terminology, influenced by demographic factors such as gender, professional role, and educational level. Accordingly, this study aimed to assess awareness, attitudes, and perceived barriers toward Arabicized medical terminology among medical students and faculty members in Jordan and to examine how these factors relate to demographic characteristics and language proficiency.

Materials and Methods

This quantitative cross-sectional survey examined awareness, attitudes, and perceived barriers toward Arabicized medical terminology among medical students and faculty members at all Jordanian universities offering medical programs. These institutions included the University of Jordan, Jordan University of Science and Technology, Yarmouk University, the Hashemite University, Mutah University, and Applied Sciences University. Data collection took place between October and November of the 2021/2022 academic year.

The sample size was calculated using G*Power 3.1 (Universität Kiel, Germany). For students, a convenience sampling approach was used with assumptions of a small effect size, an alpha level of 0.05, and a statistical power of 0.90, resulting in an estimated sample size of 852; ultimately, 855 student responses were obtained. For faculty members, a medium effect size was assumed with the same alpha and power levels, yielding an estimated sample size of 185; a total of 202 professors participated. Individuals whose mother tongue was not Arabic or who had lived in an English-speaking country for more than 16 years were excluded.

Two versions of the survey (one for students and one for professors; see Appendices I and II) were developed to assess participants' awareness, attitudes, and perceived barriers regarding Arabicization. The questionnaire comprised four sections. The first captured demographic and language proficiency information, including age,

gender, income, residence, educational level, years of study (students), years of experience (professors), mother tongue, primary study language, and proficiency in Arabic and English. The second section evaluated awareness of Arabicization and Arabicized medical terminology by presenting participants with sample terms and assessing familiarity according to Cooper's [20] criteria. The third section assessed attitudes toward Arabicized medical terms using items previously validated by Al-Abed Al-Haq and Al-Essa [21]. The fourth section explored major perceived barriers. All items were rated on a five-point Likert scale (strongly agree to strongly disagree).

Arabicized medical terms used in the awareness section were selected from the Unified Medical Dictionary (4th edition [22], an authoritative reference approved by the Jordan Academy of Arabic. Terms were chosen according to Sager's [23] model for generating specialized vocabulary, which outlines five key themes for constructing medical terminology: anatomical description, physiological function, disease/pathology nomenclature, diagnostic tests, and surgical procedures. Each theme was represented by ten terms, following the approach used by Al-Abed Al-Haq and Al-Essa [21]. Term selection was based on consensus from five linguistics experts and five medical specialists. The entire questionnaire and term lists underwent face validation through review by experts in linguistics, medicine, and biomedical sciences, who also ensured the instrument posed no psychological or personal risk to participants. Ethical approval was granted by the Institutional Review Board of the Deanship of Graduate Studies at Al-Albayt University.

A pilot test involving 25 participants was conducted to ensure clarity, comprehensibility, and content validity. Respondents provided feedback on item clarity, and necessary revisions were made. Pilot participants were excluded from the final analysis. The finalized questionnaire was administered electronically through Google Forms and distributed via social media platforms such as WhatsApp and Facebook, as well as through student online groups. Faculty members were contacted directly by the researchers through phone or email. Electronic informed consent was obtained from all participants through a required acknowledgment form preceding access to the survey.

Awareness, attitude, and barrier scores were calculated using the five-point Likert scale, with values ranging from 1 to 5, where higher scores indicated greater awareness, more positive attitudes, or stronger perceived barriers. Data were analyzed using SPSS version 23. Descriptive statistics were summarized in frequency tables (see **). Awareness, attitude, and barrier scores were treated as continuous variables and met the assumptions for parametric testing, including normality as confirmed by the Kolmogorov–Smirnov test. Comparisons between two groups were conducted using independent-samples t-tests, while comparisons involving three or more groups used one-way ANOVA with Tukey's post hoc test. Statistical significance was set at $P < 0.05$.

Results and Discussion

This section presents the findings derived from the survey, focusing on participants' awareness, attitudes, and perceived barriers regarding Arabicization. The results are organized into two main subsections: the first reports outcomes related to medical students, while the second addresses those pertaining to university professors.

Awareness, attitudes, and barriers of medicine students towards Arabicization
A total of 855 medical students participated in the study, yielding a response rate of 99%. The mean age of the student sample was 22.42 ± 2.71 years, with a male-to-female ratio of approximately 1.03. Students were almost evenly distributed between pre-clinical and clinical stages of study, and roughly 11% were enrolled in advanced specialty levels. Most participants resided in urban areas and reported Arabic as their native language. The majority rated their proficiency in Arabic as excellent, while most also evaluated their English proficiency as excellent or very good. Detailed demographic and language proficiency characteristics of the student sample are provided in **Table 1.**

Table 1. Demographic, and language proficiency information among students.

Variable	N	%
Institution		
The University of Jordan	154	18.0
The Hashemite University	126	14.7
Jordan University of Science and Technology	240	28.1
Yarmouk University	136	15.9

Mutah University	132	15.4
Applied Sciences University	59	5.90
Level of study		
Pre-clinical years (years 1–3)	386	45.1
Clinical years (years 4–7)	360	42.1
Higher Specialty	101	11.8
Gender		
Female	416	48.7
Male	431	50.4
Highest education of parent		
Less than bachelor	190	22.2
Bachelor	441	51.6
Graduate	216	25.3
Family income		
<700 JDs	364	42.6
700-1100 JDs	149	17.4
>1100 JDs	334	39.1
Place of Living		
Urban	570	66.7
Suburban	277	32.4
Mother language		
Arabic	758	88.7
Another language beside Arabic	89	10.4
Study language at school		
Arabic	371	43.4
English	52	6.1
English with Arabic subjects	420	49.1
Other languages	4	0.5
Arabic language proficiency		
Excellent	559	65.4
Very good	248	29.0
Good	40	4.7
English language proficiency		
Excellent	296	34.6
Very good	372	43.5
Good	179	20.9

Table 2 summarizes students' awareness of Arabicized medical terms based on Cooper's criteria (Cooper, 1989). Overall, roughly half of the respondents expressed positive agreement regarding their awareness of the provided terms, with percentages ranging from 42.2% to 67.0%. Specifically, positive agreement rates for the domains of knowledge, evaluation, usage, proficiency, and adoption were 48.1–67.0%, 54.7–60.9%, 58.2–64.9%, 50.3–57.0%, and 42.2–49.1%, respectively, as illustrated in **Figure 1.**
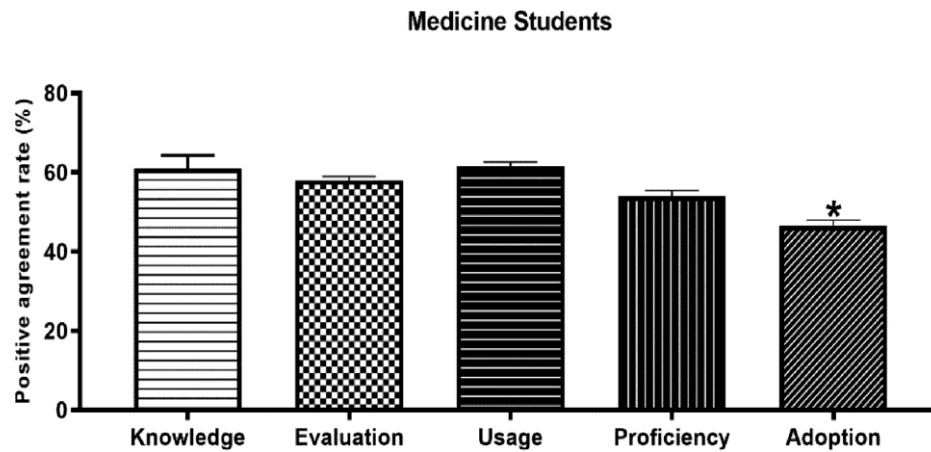
Figure 1. depicts medical students' acceptance of Arabicized medical terminology using the framework proposed by Cooper *et al.* [20]. In general, more than half of the respondents expressed favorable agreement with the items presented. Notably, students reported markedly lower endorsement of the *adoption* of Arabicized terms when compared with the other dimensions—knowledge, evaluation, usage, and proficiency. The asterisk (*) indicates categories that differ significantly from the others at $p < 0.05$.

Table 2. provides an overview of students' levels of awareness of Arabicized medical terms according to Cooper's criteria.

Variable	Agree	Strongly Agree	Neutral	Disagree	Strongly disagree
	N(%)	N(%)	N(%)	N(%)	N(%)
Arabicized terms according to Anatomical location					
Knowledge	*249(19.1)*	248(29.0)	111(13.0)	185(21.0)	54(6.3)
Evaluation	273(31.9)	211(24.7)	147(17.2)	156(18.2)	60(7.0)
Usage	292(34.2)	205(24.0)	112(13.1)	178(20.8)	60(7.0)
Proficiency	243(28.4)	195(22.8)	143(16.7)	171(20.0)	95(11.1)
Adoption	195(22.8)	166(19.4)	119(13.9)	166(19.4)	201(23.5)
Arabicized terms according to Physiological functions					
Knowledge	289(33.8)	273(31.9)	96(11.2)	136(15.9)	53(6.2)
Evaluation	266(31.1)	230(26.9)	151(17.7)	134(15.7)	66(7.7)
Usage	332(38.8)	223(26.1)	118(13.8)	129(15.1)	45(5.3)
Proficiency	277(32.4)	201(23.5)	147(17.2)	139(16.3)	83(9.7)
Adoption	226(26.4)	184(21.5)	141(16.5)	165(19.3)	131(15.3)
Arabicized terms according to Disease/pathology-based nomenclature					
Knowledge	292(34.2)	221(25.8)	127(14.9)	149(17.4)	58(6.8)
Evaluation	273(31.9)	195(22.8)	177(20.7)	144(16.8)	58(6.8)
Usage	322(37.7)	183(21.4)	130(15.2)	151(17.7)	61(7.1)
Proficiency	238(27.8)	192(22.5)	182(21.3)	151(17.7)	84(9.8)
Adoption	211(24.7)	165(19.3)	163(19.1)	174(20.4)	134(15.7)
Arabicized terms according to Examination tests					
Knowledge	338(39.5)	235(27.5)	143(15.7)	102(11.9)	38(4.4)
Evaluation	281(32.9)	239(28.0)	182(21.3)	100(11.7)	45(5.3)
Usage	361(42.2)	180(21.1)	157(18.4)	105(12.3)	44(5.1)
Proficiency	295(34.5)	195(22.8)	161(18.8)	132(15.4)	64(7.5)
Adoption	252(29.5)	170(19.9)	170(19.9)	152(17.8)	103(12.0)
Arabicized terms according to Surgical procedures and operations					
Knowledge	301(35.2)	244(28.5)	132(15.4)	133(15.6)	37(4.3)
Evaluation	286(33.5)	222(26.0)	176(20.6)	117(13.7)	46(5.4)

Usage	343(40.1)	183(21.4)	152(17.8)	131(15.3)	38(4.4)
Proficiency	275(32.2)	200(23.4)	167(19.5)	143(16.7)	62(7.3)
Adoption	237(27.7)	183(21.4)	164(19.2)	160(18.7)	103(12.0)

The adoption of Arabicized medical terms among students was notably lower than their responses in areas such as knowledge, evaluation, usage, and proficiency **(Figure 1)**. No significant differences were observed in students' responses across the various categories of Arabicized terms presented, as classified by Sager [23].

Table 3 presents the attitudes of medical students toward Arabicization. A significant portion of the students (63.6%) expressed agreement with the statement that their confidence increased when using Arabicized medical terms. Over half (59.9%) supported the idea of standardizing these terms to promote their adoption across the Arab world. Furthermore, 69.8% believed that shorter syllables in Arabicized terms would aid in their spread, while 67.4% thought that certain terms needed to be refined and rephrased. Additionally, 65.6% of students felt that Arabicized medical terms are crucial for helping the Arabic language adapt to contemporary advancements **(Figure 2)**.
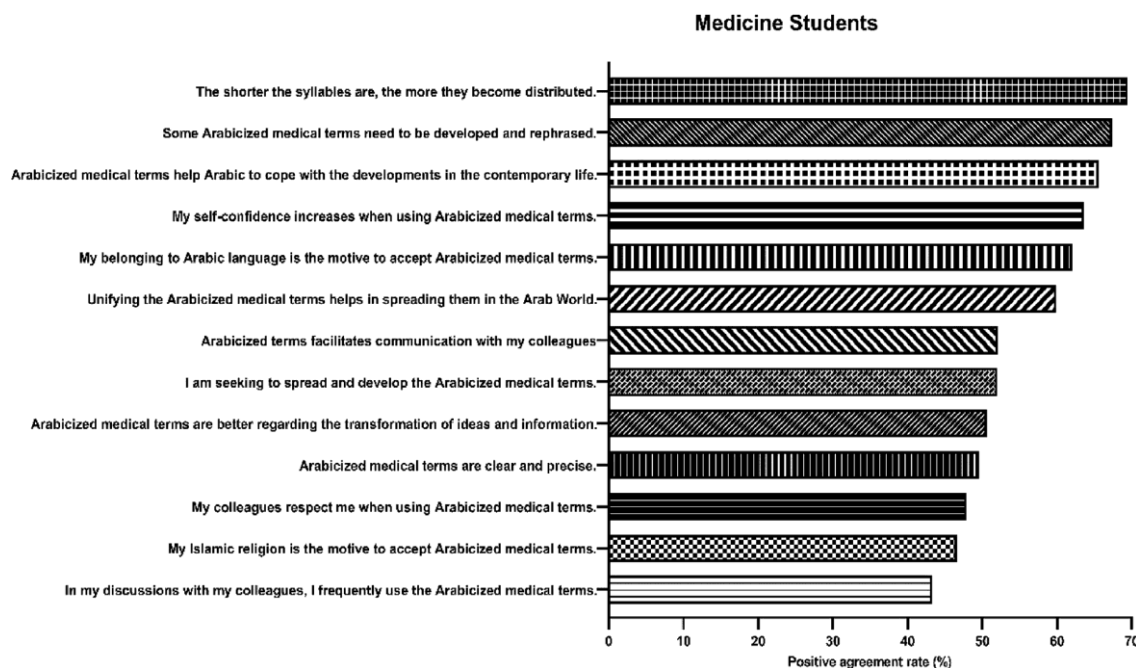
Figure 2. illustrates the attitudes of medical students toward Arabicized medical terms. The most favorable responses were related to the need for shorter syllables, the importance of further developing and refining certain Arabicized terms, and the belief that these terms enable Arabic to adapt to modern advancements.

Table 3. presents the attitudes of medical students toward Arabicized medical terms.

Statement	Agree (%)	Strongly Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
My self-confidence increases when using Arabicized medical terms.	21.6	42.0	15.1	13.5	6.9
My connection to the Arabic language motivates me to accept Arabicized medical terms.	32.5	29.5	18.1	13.0	6.0
My Islamic religion motivates me to accept Arabicized medical terms.	22.5	24.1	25.3	16.8	10.4
I believe Arabicized medical terms are more effective than English terms in conveying ideas and information.	22.3	28.3	18.7	15.7	14.0
I think Arabicized medical terms facilitate communication with my colleagues.	27.4	24.7	16.4	16.5	14.2
I think standardizing Arabicized medical terms will help spread them across the Arab world.	33.1	26.8	22.8	9.4	7.0

I believe that shorter Arabicized medical terms are more likely to be adopted.	36.3	33.2	17.1	7.3	5.3
I think Arabicized medical terms are clear and precise.	26.8	22.8	24.7	15.1	9.7
I believe some Arabicized medical terms need further development and rephrasing.	35.2	32.2	22.3	4.7	4.7
I feel respected by my colleagues when I use Arabicized medical terms.	24.9	23.0	31.9	11.9	7.3
I think Arabicized medical terms help Arabic adapt to modern developments.	38.5	27.1	19.9	8.0	5.6
I frequently use Arabicized medical terms in discussions with my colleagues.	23.3	20.0	22.2	16.8	16.7
I actively seek to promote and develop Arabicized medical terms.	28.1	23.9	25.4	10.9	10.9

Regarding the barriers to using Arabicized medical terms among medical students, the most commonly agreed-upon obstacles were that assignments, exams, and projects predominantly require English medical terminology (62.5%) and the lack of valuable medical references that use Arabicized terms (62.0%). Additionally, most of the required references for university courses in medical colleges are in English and utilize English medical terms (64.0%), as shown in **Table 4**.

Other notable barriers that approximately 50% of students agreed with included: unfamiliarity with Arabicized medical terms either personally (53.7%) or among colleagues (53.9%), confusion caused by the terms (51.9%), concerns about the acceptance of these terms by peers (51.9%), fear that using Arabicized terms could negatively impact academic progress (51.3%), performance on international exams (52.4%), and future academic opportunities abroad (52.5%). These barriers are further illustrated in **Table 7** and **Figure 3** below.
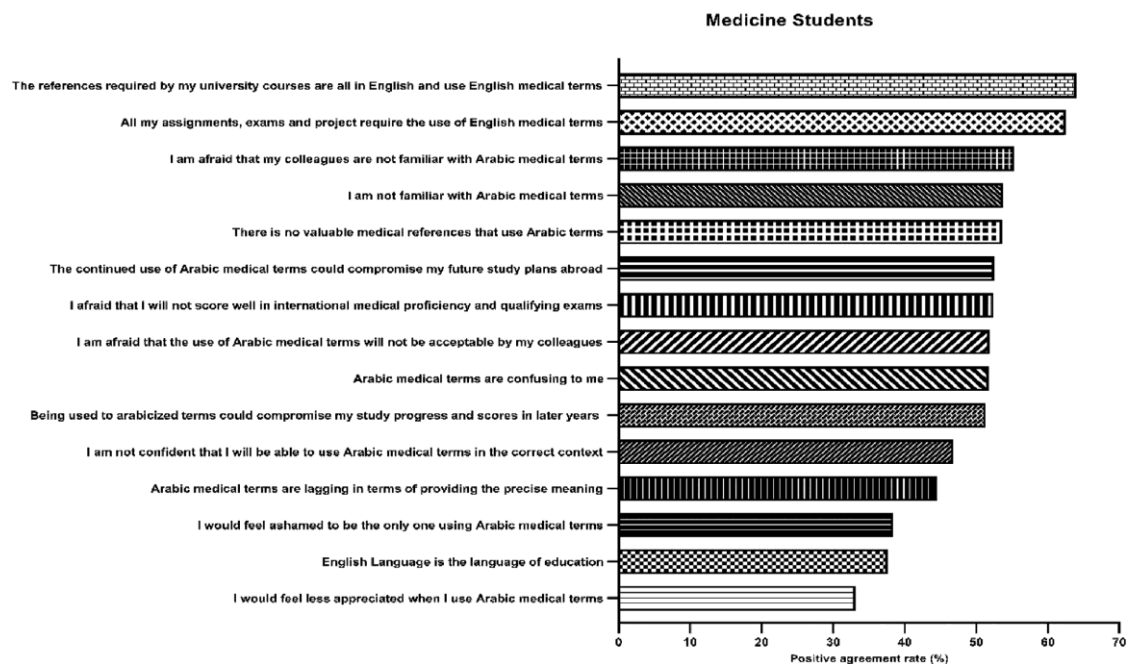
Figure 3. illustrates the barriers faced by medical students in adopting Arabicized medical terms. The two most frequently cited obstacles were that course references are primarily in English and that university assignments and projects require the use of English medical terminology.

Table 4. outlines the barriers to the Arabicization of medical terms among students.

Statement	Agree (%)	Strongly Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
I lack familiarity with Arabic medical terms.	26.4	27.3	14.3	18.9	12.2

I worry that my colleagues are unfamiliar with Arabic medical terms.	29.0	26.3	17.7	20.7	5.4
I would feel undervalued using Arabic medical terms.	13.8	19.3	20.8	29.5	13.7
Arabic medical terms lack precision in meaning.	20.9	23.6	22.3	22.5	9.7
Arabic medical terms confuse me.	23.6	28.1	19.8	20.7	6.9
I lack confidence in using Arabic medical terms appropriately.	22.9	23.9	22.7	21.1	8.5
I am concerned that my colleagues will not accept Arabic medical terms.	24.2	27.7	23.3	17.0	6.9
I would feel awkward being the only one using Arabic medical terms.	19.2	19.2	24.9	26.2	9.5
English is the main language used in my education.	17.7	19.9	26.5	23.7	11.2
Using Arabic medical terms may hinder my academic progress, as future studies rely on English terms.	23.5	27.8	23.3	17.9	6.5
All my assignments, exams, and projects require English medical terms.	22.6	39.9	18.1	14.4	4.1
There are no significant medical references in Arabic.	21.8	31.8	25.0	16.0	4.4
Required references for my courses are in English and use English medical terms.	21.2	42.8	17.9	13.2	4.0
I fear poor performance in international medical exams due to the use of Arabic terms.	22.2	30.2	23.9	17.9	4.2
Continued use of Arabic medical terms might affect my plans to study abroad.	22.7	29.8	22.6	18.6	5.4

Students in advanced specialty training exhibited significantly higher awareness and fewer perceived barriers (P < 0.05) compared to both pre-clinical and clinical students. They also showed more favorable attitudes (P < 0.05) than clinical-year students. Clinical-year students, in comparison to pre-clinical students, had significantly more positive attitudes and lower perceived barriers (P < 0.05). Males demonstrated significantly greater awareness (P = 0.006) and more positive attitudes (P < 0.001) than females. Students from high-income families reported significantly fewer barriers (P < 0.05) than those from middle- or low-income families. Middle-income students likewise perceived fewer barriers (P < 0.05) than low-income students. Suburban residents displayed significantly more positive attitudes toward Arabicized medical terms (P = 0.044). Students with an additional mother tongue besides Arabic showed significantly higher awareness (P = 0.002) and more positive attitudes (P < 0.001), but also greater perceived barriers (P < 0.001) than Arabic monolinguals. Those educated in mixed Arabic–English schools had higher awareness (P < 0.05) but less favorable attitudes and more barriers (P < 0.05 each) than students who studied exclusively in Arabic or exclusively in English. Students rating their standard Arabic as excellent had significantly higher awareness and more positive attitudes (P < 0.05) than those with very good or good proficiency. Students with good proficiency showed lower awareness and less positive attitudes (P < 0.05) than those with very good proficiency. Both excellent and good proficiency groups reported fewer barriers (P < 0.05) than the very good proficiency group. Students with excellent English proficiency displayed significantly higher awareness and more positive attitudes toward Arabicization (P < 0.05) than those with very good or good English skills. At the same time, they perceived significantly more barriers to Arabicization (P < 0.05).

Table 5. Mean scores for awareness, attitudes, and perceived barriers according to demographic and educational characteristics of the participants.

Variable	Awareness		Attitude		Barriers	
	Mean ± SD	P-value	Mean ± SD	P-value	Mean ± SD	P-value
Level of study		**<0.001**		**0.005**		**<0.001**

Pre-clinical years (years 1–3)	85.97 ± 26.20	46.87 ± 12.93	56.17 ± 12.65
Clinical years (years 4–7)	84.30 ± 23.28	44.43 ± 12.53[a]	50.04 ± 14.30[a]
Higher Specialty	98.77 ± 16.89[a]	48.08 ± 9.58[c]	39.13 ± 11.96[a]
Gender	**0.006**	**<0.001**	0.551
Female	84.43 ± 23.69	43.98 ± 12.14	51.23 ± 13.39
Male	89.07 ± 24.92	47.90 ± 12.49	51.82 ± 15.20
Highest education of the parent	0.051	0.639	**0.037**
Less than bachelor	46.45 ± 10.38	50.83 ± 13.32	85.27 ± 21.88
Bachelor	46.69 ± 12.99	51.95 ± 15.06	88.78 ± 24.97
Graduate	44.10 ± 12.92	51.29 ± 13.76	84.05 ± 25.14[c]
Family income	**<0.001**	**<0.001**	**<0.001**
<700 JDs	48.16 ± 12.58	54.21 ± 14.27	90.37 ± 25.17
700-1100 JDs	46.11 ± 11.63	48.83 ± 14.72	87.33 ± 22.08[b]
>1100 JDs	43.53 ± 12.28	49.81 ± 13.78[b]	82.64 ± 24.00[a]
Place of Living	0.926	**0.044**	0.586
Urban	86.84 ± 24.83	45.37 ± 12.87	51.72 ± 14.12
Suburban	86.68 ± 23.60	47.21 ± 11.52	51.14 ± 14.79
Mother language	**0.002**	**<0.001**	**<0.001**
Arabic	85.30 ± 23.91	45.52 ± 12.25	50.93 ± 14.13
Another language beside Arabic	99.44 ± 25.14	49.84 ± 13.62	56.67 ± 15.15
Study language at school	**<0.001**	**<0.001**	**<0.001**
Arabic	42.35 ± 12.63	54.16 ± 11.20	80.21 ± 22.13
English	41.35 ± 13.61	56.77 ± 10.24	73.63 ± 27.31
English with Arabic subjects	49.67 ± 11.03[a]	48.55 ± 16.48[a]	94.11 ± 23.77[a]
Arabic language proficiency	**<0.001**	**<0.001**	**<0.001**
Excellent	91.38 ± 25.75	47.70 ± 13.44	54.02 ± 14.87
Very good	79.26 ± 18.11[a]	43.43 ± 9.12[a]	45.35 ± 11.72[a]
Good/acceptable	69.28 ± 19.76[b]	37.68 ± 10.34[b]	55.03 ± 8.99
English language Proficiency	**<0.001**	**<0.001**	**0.027**
Excellent	97.80 ± 25.33[a]	49.27 ± 13.70[a]	53.03 ± 16.77
Very good	82.27 ± 21.70	44.12 ± 11.74	49.88 ± 13.39[b]
Good	77.97 ± 21.60	44.37 ± 10.59	52.48 ± 11.28

A P-value below 0.05 reflects a statistically meaningful difference.
a" marks values that differ significantly from every other category.
b" marks values that differ significantly only from the reference (first) category.
 c" marks values that differ significantly only from the second category.

Awareness, attitudes, and barriers of medicine professors towards Arabicization

The study included 202 medical faculty members with a mean age of 38.12 years (SD = 13.34). The majority had over five years of professional experience (83.7%), were native Arabic speakers (92.4%), and had received their medical education or training primarily in English (91.1%). Most participants rated their proficiency in Arabic as excellent (83.8%) and in English as excellent (60.4%). Additional demographic and language-related characteristics of the participants are presented in **Table 6**. Faculty members' awareness of Arabicized medical terminology—assessed using Cooper's criteria [20] and classified according to Sager's categories [23]—is detailed in **Table 7**.

Table 6. Demographic characteristics and language proficiency of the participating professors

Variable	N	%
Institution		
The University of Jordan	32	16.2
The Hashemite University	31	15.7

Jordan University of Science and Technology	77	39.1
Yarmouk University	28	14.2
Mutah University	28	14.2
Years of Experience		
<5 years	32	16.2
>5–15 years	81	41.1
>15 years	84	42.6
Gender		
Female	55	27.9
Male	142	72.1
Mother Language		
Arabic	182	92.4
Non-Arabic	15	7.6
Study/training language		
English	181	91.9
Non-English	16	8.1
Language of study/training country		
English	136	69.0
Arabic	51	25.9
Others	10	5.1
Arabic language Proficiency		
Excellent	165	83.8
Very good	27	13.7
Good	5	2.5
English language Proficiency		
Excellent	119	60.4
Very good	60	30.5
Good	18	9.1

Table 7. Medical professors' awareness of Arabicized terminology based on Cooper's criteria

Variable	Agree	Strongly Agree	Neutral	Disagree	Strongly disagree
	N(%)	N(%)	N(%)	N(%)	N(%)
Arabicized terms according to Anatomical location					
Knowledge	76(38.6)	26(13.2)	25(12.7)	56(28.4)	14(7.1)
Evaluation	78(39.6)	14(7.1)	49(24.9)	35(17.8)	21(10.7)
Usage	80(40.6)	17(8.6)	28(14.6)	52(26.6)	20(10.2)
Proficiency	53(26.9)	8(4.1)	30(15.2)	67(38.6)	30(15.2)
Adoption	17(8.6)	5(2.5)	30(15.2)	78(39.6)	67(34.0)
Arabicized terms according to Physiological functions					
Knowledge	82(41.6)	34(17.3)	24(12.2)	44(22.3)	13(6.6)
Evaluation	63(32.0)	18(9.1)	46(23.4)	50(25.4)	20(10.2)
Usage	83(42.1)	29(14.7)	28(14.2)	47(23.9)	10(5.1)
Proficiency	60(30.5)	17(8.6)	27(13.7)	63(32.0)	30(15.2)
Adoption	34(17.3)	9(4.6)	28(14.2)	80(40.6)	46(23.4)
Arabicized terms according to Disease/pathology-based nomenclature					
Knowledge	74(37.6)	23(11.7)	31(15.7)	56(28.4)	13(6.6)
Evaluation	66(33.5)	13(6.6)	41(20.8)	57(28.9)	20(10.2)
Usage	73(37.1)	21(10.7)	36(18.3)	52(26.4)	15(7.6)
Proficiency	53(26.9)	15(7.6)	33(16.8)	63(32.0)	33(16.8)
Adoption	31(15.7)	8(4.1)	28(14.2)	76(38.6)	54(27.4)
Arabicized terms according to Examination tests					
Knowledge	104(52.8)	33(16.8)	22(11.2)	30(15.2)	8(4.1)

Evaluation	75(38.1)	30(15.2)	44(22.3)	34(17.3)	14(7.1)
Usage	105(53.3)	31(15.7)	24(12.2)	29(14.7)	8(4.1)
Proficiency	71(36.0)	27(13.7)	29(14.7)	42(21.3)	28(14.2)
Adoption	53(26.9)	15(7.5)	25(12.7)	65(33.0)	39(19.8)
Arabicized terms according to Surgical procedures and operations					
Knowledge	90(45.7)	33(16.8)	33(16.8)	31(15.7)	10(5.1)
Evaluation	73(37.1)	25(12.7)	47(23.9)	35(17.8)	17(8.6)
Usage	86(43.7)	32(16.2)	29(14.7)	38(19.3)	12(6.1)
Proficiency	71(36.0)	24(12.2)	30(15.2)	48(24.4)	24(12.2)
Adoption	46(23.4)	17(8.6)	28(14.2)	65(33.0)	41(20.8)

The highest levels of agreement or strong agreement were observed for terms Arabicized based on medical examination and testing procedures (69.1%), while the lowest were recorded for terms derived from disease or pathology naming conventions (49.3%). Overall, medical faculty showed significantly lower rates of positive agreement regarding the adoption and proficiency of Arabicized medical terms compared to their knowledge, evaluation, and actual usage of these terms, as presented in **Figure 4.**
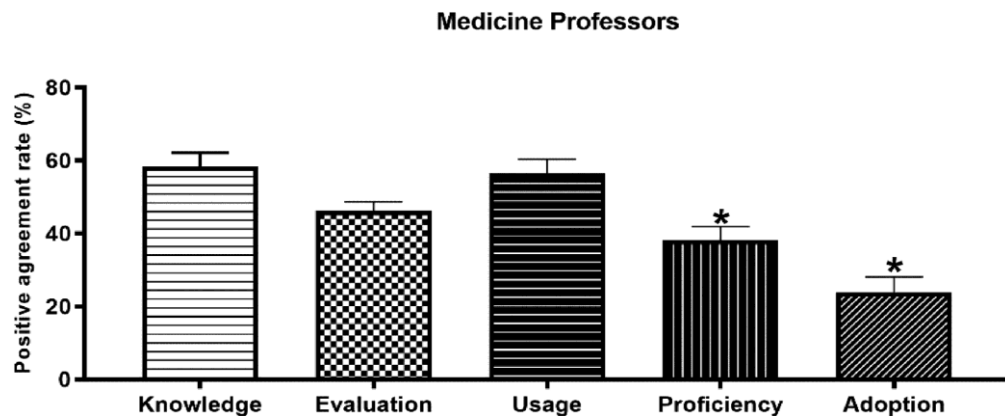
Figure 4. Medical professors' acceptance of Arabicized terminology based on Cooper *et al.*'s [20] framework. Positive responses generally surpassed 50%. Faculty members were markedly less supportive of the adoption and mastery of these terms than they were of recognizing, assessing, or actually using them (*$p < 0.05$ vs. the other three criteria).

On the attitudinal side, most professors either agreed or strongly agreed that providing concise Arabic equivalents helps promote their use (64.3%) and that many more terms still need to be coined or improved (70.0%). Full details of the remaining attitude questions appear in **Table 8** and are visualized in **Figure 5**.
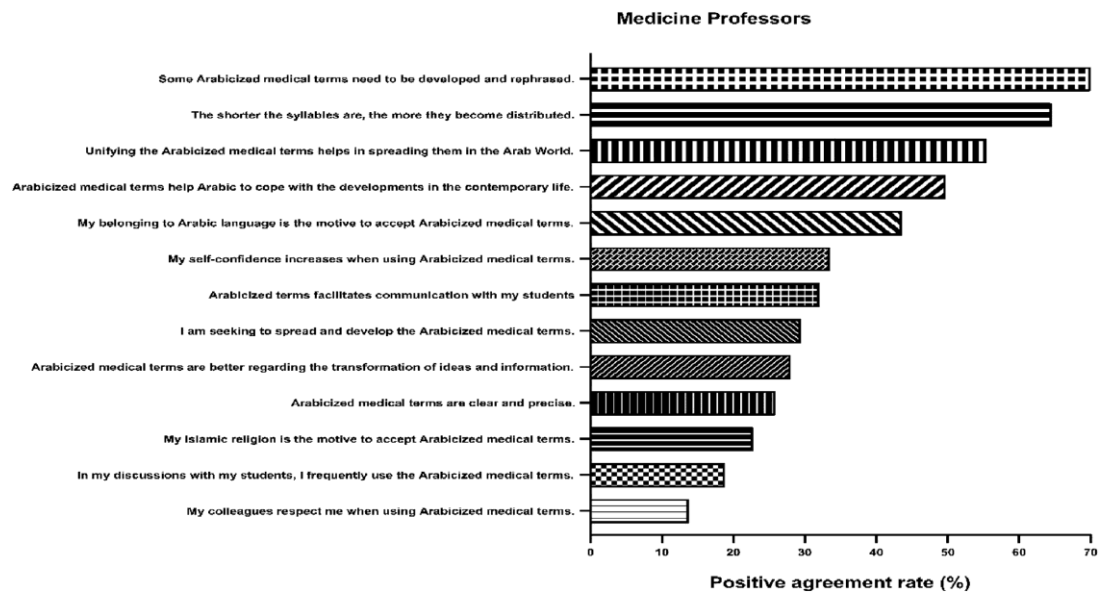
Figure 5. Medical professors' attitudes toward Arabicized medical terminology. The strongest agreement was seen for the need to create and refine additional terms, the value of using shorter Arabic equivalents, and the importance of standardizing these terms across the Arab world to boost their widespread adoption.

Table 8. Professors' attitudes regarding Arabicized medical terminology.

Statement	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)
Using Arabicized medical terms boosts my self-confidence	45 (22.8)	21 (10.7)	37 (18.8)	74 (37.6)	20 (10.2)
My attachment to the Arabic language motivates me to accept Arabicized terms	30 (15.2)	56 (28.4)	43 (21.8)	49 (24.9)	19 (9.6)
My Islamic faith drives me to accept Arabicized medical terms	19 (9.6)	26 (13.2)	58 (29.4)	66 (33.5)	28 (14.2)
Arabicized terms convey ideas and information more effectively than English ones	20 (10.2)	35 (17.8)	34 (17.3)	73 (37.1)	35 (17.8)
Arabicized terms make communication with students easier	13 (6.6)	50 (25.4)	36 (18.3)	63 (32.0)	35 (17.8)
Standardizing Arabicized terms across the Arab world would help promote their use	46 (23.4)	63 (32.0)	32 (16.2)	36 (18.3)	20 (10.2)
The shorter the Arabicized term, the more widely it will be adopted	37 (18.8)	90 (45.7)	33 (16.8)	22 (11.2)	15 (7.6)
Arabicized medical terms are clear and precise	14 (7.1)	37 (18.8)	49 (24.9)	69 (35.0)	28 (14.2)
Many Arabicized terms still need further development and refinement	56 (28.4)	82 (41.6)	29 (14.7)	20 (10.2)	10 (5.1)
My colleagues respect me more when I use Arabicized terms	7 (3.6)	20 (10.2)	83 (42.1)	66 (33.5)	21 (10.7)
Arabicized medical terms help the Arabic language keep pace with modern advancements	28 (14.2)	70 (35.5)	46 (23.4)	38 (19.3)	15 (7.6)
I regularly use Arabicized terms when discussing topics with my students	8 (4.1)	29 (14.7)	43 (21.8)	85 (43.1)	32 (16.2)
I actively work to promote and improve Arabicized medical terminology	14 (7.1)	44 (22.3)	63 (32.0)	43 (21.8)	33 (16.8)

Table 9 presents the barriers faced by medical professors in adopting Arabicized terminology.

The obstacles most frequently endorsed (with agreement or strong agreement) were: University textbooks and reference materials are exclusively in English and rely on English terminology (87.8%). All coursework, examinations, and projects mandate the use of English medical terms (82.8%). Worry that students lack familiarity with Arabicized terms (80.2%). Scarcity of medical literature written in Arabic or using Arabicized terminology (77.6%) In contrast, the least commonly reported barriers were feeling diminished professional respect (23.9%) or embarrassment (27.0%) when employing Arabic medical terms **(Figure 6).**
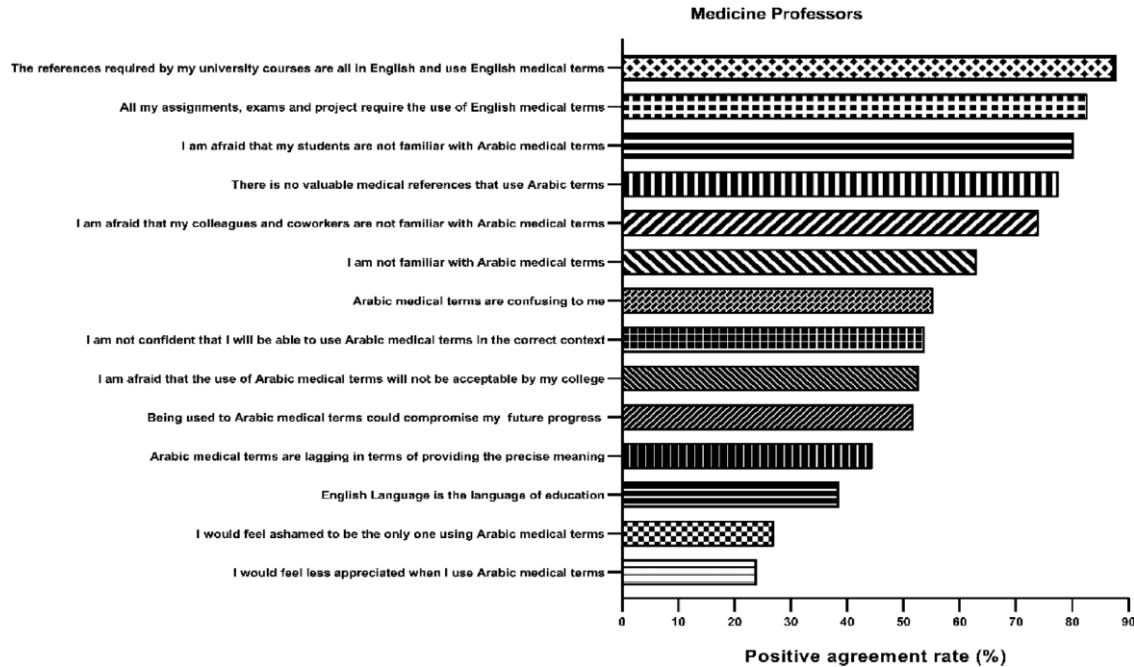
Figure 6. Barriers encountered by medical professors in using Arabicized medical terminology. The two most strongly endorsed obstacles were the exclusive use of English-language references in university teaching and the mandatory requirement of English medical terms in assignments, exams, and coursework.

Table 9. Perceived barriers to the adoption of Arabicized medical terminology among professors.

Statement	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)
I am not sufficiently familiar with Arabicized medical terms	35 (17.8)	89 (45.2)	30 (15.2)	37 (18.8)	6 (3.0)
I worry that my colleagues are unfamiliar with Arabicized terms	39 (19.8)	107 (54.3)	25 (12.7)	24 (12.2)	2 (1.0)
I am concerned that my students do not know Arabicized terms	46 (23.4)	112 (56.9)	21 (10.7)	14 (7.1)	4 (2.0)
Using Arabicized terms would make me feel less respected	12 (6.1)	35 (17.8)	65 (33.0)	66 (33.5)	19 (9.6)
Arabicized terms often fail to convey precise meanings	31 (15.7)	57 (28.9)	49 (24.9)	44 (22.3)	16 (8.1)
Arabicized terms are confusing to me	37 (18.8)	72 (36.5)	41 (20.8)	35 (17.8)	12 (6.1)
I lack confidence in using Arabicized terms correctly	34 (17.3)	72 (36.5)	42 (21.3)	37 (18.8)	12 (6.1)
I fear the faculty would disapprove of Arabicized terminology	29 (14.7)	75 (38.1)	54 (27.4)	34 (17.3)	5 (2.5)
I would feel embarrassed being the only one using Arabic terms	20 (10.2)	33 (16.8)	50 (25.4)	75 (38.1)	19 (9.6)
English is the established language of medical education	22 (11.2)	54 (27.4)	41 (20.8)	62 (31.5)	18 (9.1)
Relying on Arabicized terms might harm my future academic performance since all	39 (19.8)	63 (32.0)	37 (18.8)	43 (21.8)	15 (7.6)

advanced study uses English				
All coursework, exams, and projects require English terminology	77 (39.1)	86 (43.7)	19 (9.6)	12 (6.1)	3 (1.5)
There are no high-quality medical references that use Arabicized terms	95 (48.2)	58 (29.4)	24 (12.2)	12 (6.1)	8 (4.1)
All required course references are in English and use English medical terms	117 (59.4)	56 (28.4)	10 (5.1)	8 (4.1)	6 (3.0)

Differences in awareness, attitude, and perceived barrier scores among professors were analyzed according to demographic and educational variables **(Table 10)**. Significant gender differences emerged: female professors demonstrated markedly higher awareness (P < 0.001) and more favorable attitudes (P < 0.001) toward Arabicized medical terminology than male professors. Regarding self-reported English proficiency, professors who rated their English as "excellent" showed significantly more positive attitudes toward Arabicized terms (P < 0.05) than those who rated their English proficiency as only "good."

Table 10. Awareness, attitude, and perceived barrier scores by demographic and educational characteristics of the participating professors.

Variable	Awareness		Attitude		Barriers	
	Mean ± SD	P-value	Mean ± SD	P-value	Mean ± SD	P-value
Years of Experience		0.978		0.628		0.078
<5 years	73.2 ± 20.88		38.88 ± 12.72		31.44 ± 9.75	
>5–15 years	74.15 ± 21.61		38.47 ± 11.52		36.06 ± 10.36	
>15 years	73.77 ± 21.08		40.19 ± 11.52		34.58 ± 9.15	
Gender		**<0.001**		**<0.001**		0.636
Male	70.54 ± 20.99		37.39 ± 11.59		34.89 ± 9.51	
Female	82.35 ± 19.30		44.11 ± 10.60		34.15 ± 10.71	
Mother Language		0.302		0.325		0.483
Arabic	73.40 ± 21.20		39.03 ± 11.70		34.54 ± 9.51	
Non-Arabic	79.27 ± 20.679		42.13 ± 11.58		36.40 ± 13.50	
Study/training language		0.67		0.924		0.856
English	74.66 ± 21.19		39.29 ± 11.87		34.72 ± 9.86	
Non-English	64.56 ± 19.03		39.00 ± 9.75		34.25 ± 9.88	
Language of study/training country		0.551		0.206		0.171
English	73.70 ± 19.62		38.32 ± 10.67		35.47 ± 9.96	
Arabic	75.45 ± 24.90		41.73 ± 13.98		32.45 ± 9.62	
Others	67.50 ± 21.81		39.70 ± 11.61		35.30 ± 8.19	
Arabic Language Proficiency		0.944		0.101		0.412
Excellent	73.66 ± 21.22		39.67 ± 12.00		35.07 ± 10.20	
Very good	74.41 ± 19.60		35.56 ± 8.64		32.96 ± 7.12	
Good	76.60 ± 31.18		46.00 ± 12.17		31.00 ± 10.27	
English Language Proficiency		0.186		**0.006**		0.765
Excellent	75.85 ± 20.52		41.41 ± 11.81		35.08 ± 10.48	
Very good	71.83 ± 22.32		36.23 ± 11.44		33.95 ± 8.92	
Good	67.22 ± 20.55		35.22 ± 8.66[#]		34.44 ± 8.41	

#P-values <0.05 indicates significant difference from other groups.

This cross-sectional study examined current levels of awareness, attitudes, and perceived barriers toward Arabicized medical terminology among medical students and faculty members.

Key findings revealed that students' awareness of Arabicized terms ranged from 42.2% to 67.0%. Overall, the results indicate moderate awareness, generally positive attitudes, and notable progress compared to earlier reports. At the same time, participants—both students and professors—identified several persistent barriers that hinder the wider adoption and use of Arabicized medical terminology.

Awareness of Arabicization

Among medical faculty, recognition of Arabicized terms was highest for those related to diagnostic and examination procedures (69.1%) and lowest for terms based on disease or pathology nomenclature (49.3%). This pattern likely reflects the fact that diagnostic and procedural terms are more frequently used—and often required—in Arabic when communicating with patients, whereas pathology-related terminology tends to remain confined to English-language discussions among professionals.

As anticipated, professors scored progressively lower on the remaining dimensions of Cooper's [20] acceptability scale: evaluation, usage, and especially adoption. Adoption received the weakest endorsement (11.1–34.4%), which is consistent with Cooper's framework, as full adoption represents the highest and most committed level of integrating Arabicized terminology into professional practice.

Attitudes toward Arabicization

Medical students in the present study emphasized the importance of standardizing Arabicized medical terminology across the Arab world to facilitate its wider acceptance. They also highlighted the necessity of refining and rephrasing many existing terms and stressed that shorter, more concise Arabic equivalents are far more likely to gain widespread use.

These views closely mirrored those of the participating professors, most of whom agreed that adopting shorter forms promotes dissemination and that numerous terms still require further development and improvement.

The findings are consistent with Sabbour *et al*. [4], who noted that lack of agreement between medical students and faculty on Arabicization can lead to an unnatural, overly technical Arabic that feels alien to patients' everyday language. Similarly, the results parallel those reported among business students, who expressed the strongest support for revising and shortening Arabicized business terminology and for creating more user-friendly equivalents [21].

Barriers to Arabicization

Medical students identified the primary obstacles to adopting Arabicized medical terminology as the exclusive use of English for teaching and assessment (exams, assignments, projects, etc.) and the scarcity of high-quality medical references in Arabic. These concerns align closely with findings from Egypt, where both students and faculty emphasized that successful Arabicization depends on the availability of reliable translated textbooks. They also warned that without such resources, Arabicization risks isolating students from global knowledge and impairing their clinical competence [4].

Professors in the present Jordanian sample reported nearly identical barriers to those of their students and echoed the challenges observed in Egypt. A recent Saudi study similarly highlighted the lack of Arabic-language medical resources as the biggest impediment, while policymakers there indicated willingness to shift toward an Arabic-medium curriculum once these hurdles are addressed [2].

The most commonly cited barriers among Jordanian medical faculty were the dominance of English as the language of instruction and evaluation, the absence of authoritative Arabic references, and apprehension that students are unfamiliar with Arabicized terminology.

Notably, very few professors felt they would lose respect (23.9%) or feel embarrassed (27.0%) by using Arabicized terms, suggesting strong professional confidence and pride in the Arabic language among this group.

Impact of gender on Arabicization

Previous research has established gender as an important predictor of acceptance of Arabicized medical terminology. Halloush [19] found that female healthcare professionals generally displayed greater openness toward these terms than males. The present study confirmed this pattern among faculty: female professors exhibited significantly higher awareness and more favorable attitudes than their male colleagues.

Among medical students, however, the trend was reversed—male students demonstrated greater awareness and more positive attitudes toward Arabicized terminology. This finding aligns with earlier work in Saudi Arabia, where male medical students strongly preferred Arabic-medium instruction because it roughly halved their study time compared with English materials [1]. A similar gender difference emerged in a Jordanian study of business students, where males showed superior knowledge of Arabicized terms but less favorable attitudes than females [20].

Taken together, these results indicate that gender consistently influences both knowledge and attitudinal responses to Arabicized terminology, although the direction of the effect may vary between students and faculty or across disciplines.

Impact of the level of student study on Arabicization
In the present study, academic progression strongly influenced responses to Arabicized medical terminology. Students ranked in the following descending order for awareness, positive attitudes, and lower perceived barriers: advanced specialty trainees > clinical-year students > pre-clinical students—all differences statistically significant.
This pattern is consistent with prior regional findings. In Egypt, half of medical faculty acknowledged that their students struggled with English-medium instruction, with the problem being most pronounced among first-year (pre-clinical) students [4]. Similarly, a Saudi study found that 74.4% of first-year and 59.9% of third-year medical students preferred Arabic as the language of instruction [1]. These results collectively suggest that greater clinical exposure and overall academic maturity are associated with increasing acceptance of Arabicized medical terms.

Impact of the level of income on Arabicization
The study also revealed that family income significantly influenced perceived barriers to Arabicization: students from high-income households reported the fewest barriers, followed by middle-income and then low-income students. This gradient may reflect greater financial security, which can foster confidence in adopting practices that deviate from the dominant English-based medical culture [24, 25].
Additionally, students residing in suburban areas exhibited significantly more positive attitudes toward Arabicized medical terminology. This finding may stem from stronger ties to traditional Jordanian and Arab cultural values in suburban settings, combined with reduced daily exposure to Western influences compared with urban environments.

Impact of language proficiency on Arabicization
To the best of our knowledge, this is the first study to systematically examine the relationship between language proficiency and responses to Arabicization of medical terminology. Key findings include Students with an additional mother tongue besides Arabic displayed significantly higher awareness and more positive attitudes toward Arabicized terms, yet they also perceived greater barriers compared to monolingual Arabic speakers. Similarly, those educated in mixed Arabic–English school systems showed greater awareness but less favorable attitudes and higher perceived barriers than peers from purely Arabic or purely English-medium schools. These patterns align with earlier evidence that multilingual individuals may face added challenges in fully engaging with cultural or linguistic practices tied to a single language [26]. As anticipated, stronger proficiency in Arabic was consistently linked to higher awareness and more positive attitudes toward Arabicization, whereas the opposite held true for English proficiency.
This study addressed five core research questions concerning awareness, attitudes, and barriers to Arabicized medical terminology among medical students and faculty. The quantitative findings provide clear answers: A clear positive shift in attitudes is evident within the medical community, particularly among students, whose attitudes toward Arabicization were markedly more favorable than in previous reports. Faculty also expressed generally supportive views. Acceptability of Arabicized terms has improved: both students and professors reported >50% positive agreement on knowledge, evaluation, usage, and proficiency criteria. However, adoption—the highest level of acceptance—remained significantly lower for both groups. Among professors, proficiency scores were notably weaker than those for knowledge, evaluation, and usage. Overall, the medical academic community in this sample demonstrated moderate to positive acceptability of Arabicized medical terminology. Among students, significant predictors of attitudes and barriers included gender, family income, place of residence (suburban vs. urban), academic year, bilingual background, and proficiency in Arabic and English. Among professors, gender and self-rated English proficiency were the main influencing factors. A site visit and review of the Jordan Arabic Language Complex website revealed no substantive updates in policies or procedures since earlier descriptions. The persistent scarcity of high-quality medical references using Arabicized terminology—cited as a major barrier by both students and faculty—underscores the urgent need for the Complex and similar bodies to intensify efforts to produce, standardize, and disseminate authoritative Arabic-language medical resources.

Conclusion

The present study revealed a clear improvement in awareness, acceptability, and overall attitudes toward Arabicized medical terminology among medical students compared with earlier reports. The principal barriers identified by students were the exclusive use of English for instruction and assessment (examinations, assignments, projects, etc.) and the persistent lack of authoritative Arabic-language medical references. Several demographic and educational factors significantly influenced students' responses, including gender, family income, place of residence, academic year, bilingual background, and proficiency in both Arabic and English. Medical faculty demonstrated satisfactory awareness and predominantly favorable attitudes toward Arabicized terms. Notably, the barriers they reported were virtually identical to those cited by students, reinforcing the credibility and shared nature of these obstacles. Among professors, only gender and self-assessed English proficiency emerged as significant predictors of awareness, attitudes, or perceived barriers. This investigation adds valuable evidence to the ongoing evaluation of Arabicization efforts in higher education, particularly within the medical field. It offers policymakers critical insights into the feasibility of transitioning to Arabic-medium medical education, its potential to enhance academic performance, and the language-related challenges students currently face. Based on these findings, we recommend tailored interventions—targeted at specific subgroups identified in this study—to further increase awareness, foster more positive attitudes, and systematically address remaining barriers.

Limitations

Like most questionnaire-based research, the study relied on self-reported data, which carries an inherent risk of social desirability bias. The use of closed-ended items, while facilitating recruitment of a large sample and yielding consistent, quantifiable results, limited participants' ability to elaborate freely. This was partially mitigated by conducting focus-group discussions during the questionnaire validation phase; feedback from pilot participants was incorporated to ensure comprehensive and relevant response options. The scope was deliberately restricted to medical terminology and to medical students and faculty in Jordan, where Arabic is the native language and dominant societal medium for the vast majority. Individuals who have spent extended periods (>16 years) in English-speaking countries were excluded, as their markedly different linguistic profile would likely produce distinctly divergent views on Arabicization. Investigating Arabicization in other scientific disciplines or among long-term expatriate Jordanian professionals could form fruitful directions for future research.

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