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Promoting Intercultural Competence in German Medical Students via Innovative Medical Ethics Education Focused on Muslim Patients – A Pilot Study

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Abstract

Delivering high-quality healthcare in today's multicultural society requires that healthcare professionals are skilled in addressing cultural and religious differences in patient care. Despite this need, medical education often falls short in providing adequate cultural competence training, especially regarding care for Muslim patients. To address this gap, we developed an innovative educational program aimed at enhancing medical students' intercultural skills, with a focus on caring for Muslim patients. The intervention consisted of interactive seminars combined with simulated patient encounters. Intercultural competencies of n = 31 medical students from the Medical Faculty of Jena University were evaluated before and after the course using both a bespoke questionnaire and the Cross-Cultural Competence of Healthcare Professionals (CCCHP-27) instrument. A control group of 34 students was also included. Data were analyzed using descriptive statistics, paired-sample t-tests, Wilcoxon tests, correlation analyses, Mann–Whitney U-tests, and multiple regression analyses. Findings from the bespoke questionnaire indicated significant increases in overall intercultural knowledge (median pre 1.0 [0.6–1.6] vs. post 2.2 [2.4–2.8], $p < 0.001$) and specific knowledge regarding Muslim patients (median pre 1.0 [0.5–1.5] vs. post 2.5 [2–3], $p < 0.001$). CCCHP-27 scores also showed a significant improvement in skills (pre 4.10 ± 0.47; post 4.38 ± 0.40; $p = 0.001$). Female students and those with limited prior exposure to intercultural settings exhibited greater improvements ($p = 0.005$ and $p = 0.053$, respectively). The inclusion of a simulated patient session was particularly well-received, highlighting the value of experiential learning in reinforcing course content. This study underscores the critical need for embedding intercultural competency training within medical education. Our results demonstrate that targeted educational interventions can significantly enhance medical students' intercultural abilities. The bespoke questionnaire developed for this study provides a useful tool for evaluating such competencies within the German healthcare context. Integrating similar programs into medical curricula across the country is essential to equip future physicians to effectively serve diverse patient populations.

Keywords: Medical education, Muslim patients, Intercultural competence

Introduction

The shifting landscape of healthcare delivery in increasingly multicultural societies highlights the growing importance of healthcare professionals' ability to effectively engage with immigrant patients. According to the 2021 report "Muslimisches Leben in Deutschland 2020" by the Federal Office for Migration and Refugees (BAMF), the Muslim population in Germany is estimated between 5.3 and 5.6 million, accounting for roughly 6.4–6.7% of the total population [1]. In some healthcare settings, up to 30% of cases involve patients of Islamic faith [2]. This demographic trend presents a significant challenge for healthcare providers, who often encounter cultural and religious factors not covered in standard medical training [3].

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Muslim patients have distinct needs that require careful consideration. Sunni Islam, for instance, emphasizes hygiene and the maintenance of daily practices such as prayer, which contribute to overall well-being. In clinical settings, Islamic teachings stress the protection of health and, where feasible, the preference for same-gender healthcare providers to respect religious and cultural sensitivities [4–6]. A lack of understanding of these cultural and religious nuances can intensify language barriers, impede communication, and lead to misunderstandings around gender norms, modesty, and ethical issues at critical life stages [7]. Such gaps in knowledge may result in misinterpreted medical histories, compromised communication, and suboptimal treatment outcomes [8, 9]. They may also lead to neglecting patient preferences, for example, conflicts related to medication ingredients that do not comply with halal dietary practices, along with recommended strategies for addressing these concerns [5]. Additionally, patients may experience anxiety and uncertainty due to unfamiliar medical procedures, often feeling misunderstood in the process [10]. Enhancing healthcare providers' cultural competence can play a crucial role in mitigating disparities in care [3].

A content analysis survey of 90 general practitioners exploring perceptions of Muslim patients revealed that many physicians find treating Muslim patients challenging [11]. Common concerns included language barriers, differing illness perceptions, and examination situations fraught with apprehension, whereas positive experiences or smooth encounters were reported less frequently. The study concluded that Muslim patients are frequently perceived in stereotypical or less reflective ways, influenced by cultural and religious contexts [11].

Addressing these challenges necessitates deliberate efforts to strengthen healthcare practitioners' cultural competence, offering valuable learning opportunities for medical students. The efficacy of cultural competence training in improving providers' intercultural skills and reducing health disparities is well-documented [12]. However, within German medical education, this crucial area remains underemphasized, leaving future physicians inadequately prepared for the realities of diverse patient care [13]. Approaches to cultural competence and global health education vary across German universities: some address isolated aspects, while others employ integrated formats. Many programs are optional, driven by motivated faculty or student initiatives rather than embedded in formal curricula, which remain uncommon [14–16].

In 2017, the Hochschulrektorenkonferenz (HRK), representing German universities and higher education institutions, recommended enhancing curricula through internationalization, explicitly advocating for the inclusion of cultural competence and global health education [17]. Similarly, the Gesellschaft für Medizinische Ausbildung (GMA) Committee on Cultural Competence and Global Health highlighted the growing relevance of cultural and linguistic diversity in everyday medical practice across Germany, Austria, and Switzerland [16]. Their recommendations stress the integration of cultural competence and global health into medical curricula, recognizing the synergy between these areas, ensuring faculty qualifications, promoting interdisciplinary approaches, and supporting research and evaluation. Such integration equips medical students with the essential skills to effectively engage diverse patient populations, tackle global health challenges, and foster patient-centered care [16].

The establishment of the National Competence-Based Catalogue of Learning Objectives for Undergraduate Medical Education (NKLM) in 2015 represents a landmark in German medical education [16, 18]. By outlining competence-oriented learning objectives for undergraduate medical students, the NKLM explicitly incorporates cultural competence and global health, signaling a formal commitment to preparing future physicians for the realities of a culturally diverse patient population [16, 18]. This development provides a foundation for systematically embedding intercultural skills into medical curricula, enabling healthcare professionals to navigate complex cultural contexts with greater confidence and sensitivity.

A useful framework to understand the development of cultural competence is the Cultural Competence Continuum [19]. This model conceptualizes cultural competence as a progressive process, spanning from cultural destructiveness—where differences are ignored or devalued—to cultural proficiency, characterized by the active respect, integration, and utilization of cultural differences in practice [19]. Applying this continuum to the care of Muslim patients is particularly instructive, given documented instances of discrimination against diverse patient groups within the German healthcare system [20]. Early stages of cultural competence may result in unmet patient needs if factors such as dietary requirements, prayer routines, or gender-specific care

preferences are overlooked. Systematic training in intercultural competence allows healthcare providers to anticipate and address such considerations, including offering halal-compliant medications and meals, accommodating prayer times, and arranging same-gender examinations whenever possible [5].

Reliable evaluation of intercultural competence is essential for both educational development and quality assurance. Questionnaires offer a standardized method to assess the knowledge, skills, and attitudes of healthcare professionals in relation to cultural diversity. In Germany, Bernhard G. *et al.* developed the CCCHP-27, a pioneering tool designed to measure intercultural competencies within the healthcare system [21]. While most existing models originate from the United States, they reflect the sociocultural and political contexts in which they were created, underscoring the need for contextually adapted assessment tools [21].

Against this backdrop, our study introduces a targeted educational intervention designed to enhance medical students' intercultural competencies, focusing specifically on interactions with Muslim patients. The program combines theoretical knowledge with experiential learning, including engagement with a simulated patient (SP), to create opportunities for students to apply cultural knowledge in realistic clinical scenarios.

To evaluate the effectiveness of the intervention, we conducted a pre- and post-course assessment using a bespoke questionnaire that measures students' skills and knowledge in intercultural communication within medical contexts, with particular attention to the care of Muslim patients. This was complemented by the validated CCCHP-27 instrument [21], providing a robust and standardized measure of intercultural competence in the German healthcare setting. Through this dual-assessment approach, our study seeks to determine whether structured educational programs can meaningfully prepare future healthcare professionals to meet the diverse needs of contemporary patient populations.

Material and methods

Study design (Figure 1)

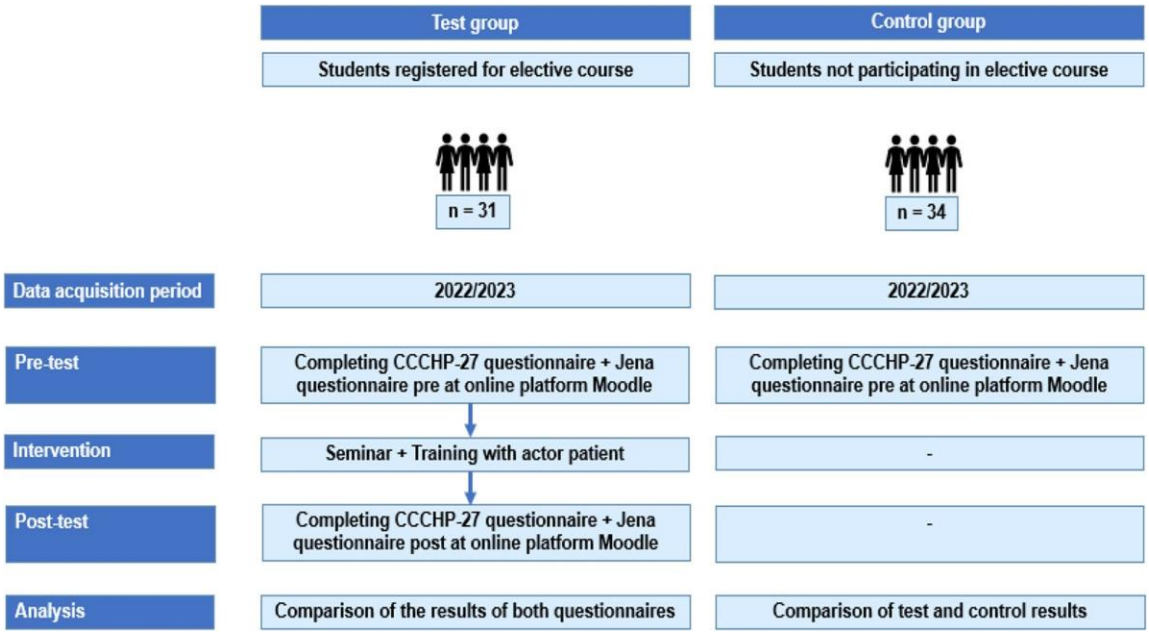

Figure 1. Study design

The elective seminar at the Medical Faculty of Jena University Hospital is offered to students from the 6th semester onward and combines theoretical learning with practical application. The program is structured into two components: an initial interactive seminar (timepoint 0), followed by a simulated patient session one week later (timepoint 1). Prior to the seminar, students complete both the validated CCCHP-27 questionnaire and a custom-designed pre-test questionnaire to assess their baseline intercultural competencies. After participation

in the seminar and simulated patient session, students complete the post-test questionnaire along with a second administration of the CCCHP-27, allowing for evaluation of learning outcomes.

To provide a comparison, a control group was formed from students in the 6th semester who either did not plan to take the course or had no prior experience with it. These students completed only the pre-test questionnaire, without addressing questions related to the simulated patient component. The analyses were exploratory in nature, framed as a longitudinal pilot study.

Course Design and Learning Approach (Appendix B)

The elective is hosted within the surgical department and aims to develop students' knowledge, skills, and attitudes in culturally sensitive healthcare. Specific learning objectives include recognizing ethico-religious considerations in patient care, interpreting behaviors influenced by these considerations, performing medical procedures with appropriate cultural sensitivity, and maintaining professionalism throughout patient interactions. The course employs a mix of blended learning, interactive seminars, and simulated patient exercises, accommodating up to 20 participants per session.

Before attending the seminar, students engage in a preparatory module on the Moodle® online platform. This self-directed 30-minute module focuses on cholecystitis, covering its pathophysiology, diagnostic approaches, and surgical management, and includes completion of the pre-test questionnaire and the CCCHP-27.

The seminar is conducted using a "sandwich" format [22] over 135 minutes, beginning with an introduction, followed by presentations and group discussions in the main seminar, a mid-point evaluation, in-depth case studies, and concluding with reflection and feedback.

The follow-up simulated patient session centers on a Muslim patient presenting with acute cholecystitis in an emergency setting. This practical exercise allows students to provide professional care while navigating ethico-religious factors, including gender preferences and language challenges, highlighting the influence of cultural differences on communication and clinical behavior according to the Cultural Competence Continuum.

During the simulation, students are divided into four functional groups:

- Group 1: Conducts patient history-taking.
- Group 2: Performs clinical examinations and informs the patient about findings.
- Group 3: Explains treatment options and procedures to the patient.
- Group 4: Provides guidance regarding hospital processes and care logistics.

After the simulation, students have an opportunity to ask questions and receive structured feedback. The session concludes with completion of the post-test questionnaire and a second round of the CCCHP-27, enabling a comprehensive assessment of the seminar's impact on students' intercultural competencies.

Data Collection

Data were obtained from participants who provided informed consent. Clear instructions were given to ensure proper completion of the questionnaires, and all responses were anonymized to maintain confidentiality.

A total of 31 students enrolled in the course completed both the pre- and post-intervention questionnaires, as well as the CCCHP-27. The control group consisted of 34 students, who completed only the pre-test questionnaire and the CCCHP-27.

Assessment of Intercultural Competence

To evaluate students' overall knowledge of intercultural competencies, and specifically their understanding of issues related to Muslim patients, we employed both a custom-designed questionnaire and the validated, multidimensional "Cross-Cultural Competence of Healthcare Professionals" (CCCHP-27) instrument [21].

Development of the Custom Questionnaire

Existing literature, studies, and assessment tools relevant to intercultural competence in healthcare—particularly regarding interactions with Muslim patients—were reviewed [21, 23–25]. Insights from this review informed the creation of a bespoke questionnaire tailored to measure the intercultural competencies of German medical students, addressing the lack of suitable existing instruments.

The questionnaire collected demographic information, including age, gender, academic year, prior experience, religious affiliation, bilingual upbringing, and proficiency in additional languages. In addition, students' motivation for participating in the course was assessed in

the pre-test questionnaire **(Table 1)**. The post-test questionnaire mirrored the pre-test items, with additional questions specifically designed to evaluate the simulated patient component.

Table 1. Items of the custom questionnaire assessing students' motivation prior to the course, with response options and the percentage of responses for n = 31 participants in the test group (T) and n = 34 participants in the control group (C), including associated p-values

Item No.	Questionnaire Item	Response Options	% Responses T	% Responses C	p-value
M1	How significant do you consider intercultural communication in medical practice?	Inconsequential	0	0	0.021
		Somewhat unimportant	0	8.8	
		Important	38.7	55.9	
		Very important	61.3	35.3	
M2	Do you feel that medical ethics receives sufficient attention in your medical studies?	No, I have not yet encountered this topic in my coursework	48.4	47.1	0.447
		Yes, the topic is included in the curriculum, but not sufficiently	45.2	29.4	
		Yes, I have been adequately exposed to it during my studies	6.4	23.5	

Additional questions were included in the custom questionnaire to measure students' overall intercultural competencies as well as competencies specifically related to interactions with Muslim patients, both before and after the course (Appendix A). Responses were rated on a 0 to 3 scale, where 0 indicated insufficient knowledge and 3 represented very good knowledge.

CCCHP-27 questionnaire [21]

The CCCHP-27 is a validated and reliable instrument for assessing cultural competence among healthcare professionals [21]. Its construct validity was supported through principal component analysis, which identified a six-component structure encompassing 32 items and explaining 50 percent of the total variance. The instrument evaluates multiple dimensions of cultural competence, including cross-cultural motivation/curiosity (CC-MC), attitudes (CC-A), skills (CC-S), emotions/empathy (CC-EE), knowledge/awareness (CC-KA), and social desirability (SD). Items are rated on a 1–5 scale, with higher scores indicating greater cross-cultural competence [21].

The components of the CCCHP-27 are as follows:

1. CC-MC: Measures healthcare professionals' motivation to provide culturally sensitive care, their interest in engaging with diverse populations, and their desire to improve understanding in cross-cultural interactions.
2. CC-A: Assesses attitudes such as tolerance, respect, and appreciation for cultural differences, as well as a positive orientation toward embracing diversity.
3. CC-S: Evaluates the ability to adapt to patients' cultural needs, communication skills, and the capacity to dedicate appropriate time to patient care.
4. CC-EE: Focuses on emotional responses to cultural diversity, including comfort in cross-cultural interactions and demonstration of multicultural empathy.
5. CC-KA: Examines knowledge related to culture and migration, understanding of health and illness concepts, and awareness of one's own values and biases.
6. SD: Captures socially desirable responses, reflecting attitudes toward cross-cultural interactions.

Data analysis

Statistical analyses were conducted using SPSS (IBM®, version 23, IBM Corporation, Armonk, NY, USA). Descriptive statistics summarized demographic data and response frequencies. For continuous variables, paired-samples t-tests were applied, reporting mean and standard deviation (CCCHP-27), with the sample size considered sufficient to use t-tests without extensive normality checks [26]. For ordinal variables, results were expressed as median and interquartile range (IQR), and analyzed using the Wilcoxon test (custom questionnaire). Spearman correlation was used to explore relationships between continuous or ordinal variables. Comparisons between two independent groups were performed using the Mann–Whitney U test, while multiple regression

analysis was conducted to adjust for potential confounding factors. Statistical significance was set at $p < 0.05$.

Results

Demographic data (Table 2)

Table 2. Demographic data of $n = 31$ study participants (test (T) group) and control (C) group ($n = 34$). M: male, f: female

	T group		C group	
Parameter	**n**	**%**	**n**	**%**
Gender				
m	8	25.8	11	32.4
f	23	74.2	23	67.6
Semester				
6th	18	58.1	16	47.1
7th	5	16.1	0	0
8th	2	6.5	6	17.6
9th	4	12.9	1	2.9
≥ 10th	2	6.4	11	32.4
Age				
20—24	24	77.4	27	79.4
25—29	5	16.1	5	14.7
≥ 30	2	6.5	2	5.9
Prior experiences				
Yes	21	67.7	27	79.4
No	10	32.3	7	20.6
Religious affiliation				
Islam	1	3.2	2	5.9
Other	30	96.8	32	94.1
Bilingual education				
Yes	4	12.9	3	8.8
No	27	87.1	31	91.2
Foreign languages				
None	2	6.5	0	0
1	11	35.5	17	50
2	10	32.2	9	26.5
≥ 3	8	25.8	8	23.5

The test group (T) comprised 31 students, including eight males and twenty three females, whereas the control group (C) included thirty four students, with eleven males and twenty three females. Students from both groups represented multiple semesters, with the 6th semester predominating (T: 58.1 percent, C: 47.1 percent). Participant ages ranged from twenty to thirty three years, with the majority falling within the 20–24-year-old range (T: 77.4 percent, C: 79.4 percent).

A considerable portion of participants reported previous experience interacting with Muslim patients (T: 67.7 percent, C: 79.4 percent). Most students did not identify as Muslim (T: 96.8 percent, C: 94.1percent). While a small minority were bilingual from childhood (T: 12.9 percent, C: 8.8 percent), the vast majority demonstrated proficiency in more than one foreign language (T: 93.5 percent, C: 100 percent). Overall, demographic and experiential characteristics indicate that the test and control groups were broadly comparable.

Motivation

Within the test group, 61.3 percent of students rated intercultural communication as very important (M1), compared with 35.3% in the control group. Responses to M2 revealed that most students in the test group (93.6%) felt that medical ethics receives insufficient attention in the curriculum, while 76.5% of the control group shared

this view. These results highlight a strong interest in intercultural competence, which is not limited to students identifying as Muslim, given that most participants did not practice the religion. A statistically significant difference between test and control groups was observed for M1 (p = 0.021), whereas no significant difference emerged for M2 (p = 0.447) **(Table 1)**.

Effectiveness of the course in enhancing intercultural competence

Participation in the course resulted in notable improvements in overall intercultural competence. Using the self-designed questionnaire, median scores increased from 1.0 (IQR 0.6–1.6) to 2.2 (IQR 2.4–2.8) for general intercultural competence, and from 1.0 (IQR 0.5–1.5) to 2.5 (IQR 2–3) for competence specifically related to interactions with Muslim patients (p < 0.001, **Table 3, Figure 2**). In contrast, the control group's competencies remained similar to the pre-test scores of the test group **(Table 3 and Table 4)**.

Table 3. Median, interquartile range (25th – 75th percentile) and *p*-value of the total scores from the respective items of own pre- and post-test-questionnaires of *n* = 31 study participants. High values indicate high competences (range 0 – 3)

Dimension	Median (25th-75th percentile) pre	Median (25th-75th percentile) post	*p*-value
Level of intercultural knowledge	1.0 (0.6 – 1.6)	2.2 (2.4 – 2.8)	< 0.001
Level of knowledge in interculturality regarding Muslim patients	1.0 (0.5 – 1.5)	2.5 (2—3)	< 0.001

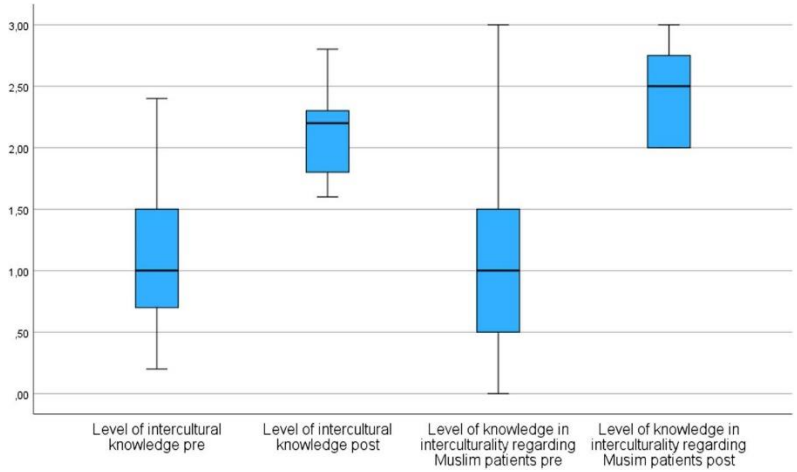

Figure 2. Gain in intercultural knowledge and knowledge regarding Muslim patients after the course in the test group, determined using the questions from the own questionnaires, n = 31

Table 4. Median and interquartile range (25th – 75th percentile) of the total scores from the respective items of own questionnaire of control group (C, *n* = 34) and post-test group (*n* = 31) with *p*-values. High values indicate high competences (range 0 – 3)

Dimension	Median (25th-75th percentile) C	Median (25th-75th percentile) post	*p*-value
Level of intercultural knowledge	1.1 (0.6 – 1.6)	2.2 (2.4 – 2.8)	< 0.001
Level of knowledge in interculturality regarding Muslim patients	1.0 (0.5 – 1.5)	2.5 (2—3)	< 0.001

To investigate how factors such as age, gender, prior exposure, and bi-/multilingualism influenced improvements in overall intercultural competence (calculated as the sum of IK1–IK5 and IM1–IM2), we computed the difference between post- and pre-course scores. No statistically significant correlation emerged

between age and competence gains (p = 0.144), though a slight negative trend (r = -0.269) suggested that younger participants tended to show larger improvements than their older peers.

Gender appeared to play a role: female students benefited more from the course, demonstrating significantly higher gains (p = 0.005). Interestingly, participants with limited prior experience interacting with culturally diverse patients experienced relatively greater improvements (p = 0.053). In contrast, bilingual upbringing did not significantly affect competence development (p = 0.237), nor did proficiency in multiple foreign languages (p= 0.241). A small negative correlation (r= -0.217) indicated that students fluent in more languages tended to have slightly smaller increases in intercultural competence.

Course outcomes measured via CCCHP-27

Analysis of the CCCHP-27 questionnaire revealed that scores for attitudes, emotions, knowledge, and social desirability remained largely consistent from pre- to post-course assessments. A minor decrease was observed in the knowledge domain, where the mean score dropped from 4.4 ± 0.5 (pre-test) to 4.2 ± 0.5 (post-test); however, this change was not statistically significant (p = 0.223, **Table 5**). Given the overall high scores, these results suggest that students' baseline knowledge remained stable.

Notably, the skills dimension showed a statistically significant improvement (p= 0.001), indicating enhanced practical competence following the course. There was also a slight increase in motivation, approaching significance (mean pre 4.4 ± 0.5, post 4.5 ± 0.5, p= 0.057), pointing to a modest overall positive effect on students' engagement.

Table 5. Mean, standard deviation (SD) and *p*-value of the total scores from the respective items of the dimensions of the CCCHP-27 questionnaire pre and post of *n* = 31 study participants. Higher values indicate enhanced cross-cultural competence (range 1 – 5)

Dimension	Mean (± SD) pre	Mean (± SD) post	*p*-value
Motivation	4.4 (± 0.5)	4.5 (± 0.5)	0.057
Attitude	3.5 (± 0.8)	3.6 (± 0.8)	0.184
Skills	4.1 (± 0.5)	4.4 (0.4)	0.001
Emotions	3.6 (± 0.5)	3.8 (± 0.4)	0.094
Knowledge	4.4 (± 0.5)	4.2 (± 0.5)	0.223
Social desirability	4.4 (± 0.5)	4.5 (± 0.4)	0.298

When post-course questionnaire scores were compared with those of the control group, significant differences emerged across most dimensions, with the exception of attitudes **(Table 6)**. The primary distinction between the test and control groups across the CCCHP-27 dimensions—motivation, attitude, skills, emotions, and social desirability—was observed in motivation, as reflected in question M1, where the test group exhibited higher motivation levels **(Table 7)**. Regarding the knowledge dimension, no significant relationship with motivation was observed (p = 0.660), with mean scores already high in both groups (T: 4.4 ± 0.5, C: 4.5 ± 0.5).

Table 6. Mean, standard deviation (SD) and *p*-value of the total scores from the respective items of the dimensions of the CCCHP-27 questionnaire of *n* = 31 study participants after the course (post) and control group (C, *n* = 34). Higher values indicate enhanced cross-cultural competence (range 1 – 5)

Dimension	Mean (± SD) C	Mean (± SD) post	*p*-value
Motivation	4 (± 0.8)	4.5 (± 0.5)	0.003
Attitude	3.4 (± 0.9)	3.6 (± 0.8)	0.357
Skills	3.5 (± 0.9)	4.4 (0.4)	< 0.001
Emotions	3.5 (± 0.8)	3.8 (± 0.4)	0.039
Knowledge	4.5 (± 0.5)	4.2 (± 0.5)	0.050
Social desirability	4 (± 0.5)	4.5 (± 0.4)	< 0.001

Table 7. Regression analysis to assess dependency of differences in the dimensions of the CCCHP-27 on m1 and m2

Dependent variable	Constant	*p*-value	95% Confidence interval
Motivation	M1	< 0.001	0.295 – 0.856
	M2	0.487	-0.275 – 0.132
Attitude	M1	0.006	0.151 – 0.844
	M2	0.104	-0.488 – 0.046
Skills	M1	0.017	0.078 – 0.756
	M2	0.059	-0.010 – 0.512
Emotions	M1	0.013	0.079 – 0.646
	M2	0.559	-0.282 – 0.154
Knowledge	M1	0.660	-0.178 – 0.280
	M2	0.080	-0.333 – 0.020
Social desirability	M1	0.044	0.006 – 0.456
	M2	0.167	-0.052 – 0.295

Evaluation of the training with the simulated patient

The session involving the simulated patient was appraised using a post-test questionnaire, where higher values (0–3) indicated stronger positive responses. Students reported that the experience allowed them to practically apply the skills learned, with a median rating of 3 (IQR: 2–3, 25th–75th percentile). Incorporating the simulated patient clearly enhanced learning effectiveness, reaching a median score of 3 (IQR: 2–3, 25th–75th percentile), and facilitated deeper comprehension of the topic, as shown by a median of 2 (IQR: 2–3, 25th–75th percentile). The case design was highly appreciated, yielding a median score of 2 (IQR: 2–3, 25th–75th percentile), and students found it conducive to thorough engagement with the material, also reflected by a median of 2 (IQR: 2–3, 25th–75th percentile).

Discussion

Mastering intercultural competence is vital for providing high-quality care in increasingly diverse healthcare settings [27]. This study describes an educational program aimed at boosting German medical students' intercultural skills, particularly when interacting with Muslim patients. The intervention employed a combination of blended learning, interactive workshops, and simulated patient encounters to translate theoretical knowledge into practical abilities. The results indicate measurable improvements in intercultural competence, confirmed through questionnaire-based assessments, demonstrating successful application of learned concepts in practice.

Outcomes differed according to demographic characteristics such as age, gender, and prior experience. Younger students and female participants tended to exhibit the most substantial gains, highlighting the importance of tailoring instruction to individual needs and learning preferences. Younger learners are often more receptive to novel experiences and adaptable—traits that are essential for developing intercultural competence. In the context of globalization and internationalization in higher education, exposure to cross-cultural interactions is increasingly inevitable. Strengthening intercultural competence equips students to collaborate with international peers, navigate diverse academic contexts, and prepare for multicultural professional environments. Programs such as international exchanges or study-abroad opportunities are particularly valuable, as they immerse students in different cultural settings, enhancing adaptability and global perspective [28, 29]. Research also indicates that female participants are more likely to show higher intercultural competence gains in such programs, possibly due to more active involvement in immersive elements such as language practice and mentoring activities [30].

Interestingly, no strong link was observed between bilingualism or foreign language skills and improvements in intercultural competence, suggesting that language proficiency alone does not fully account for effective cross-cultural interactions in healthcare. Nonetheless, bilingualism has well-documented cognitive and linguistic benefits in general life [31]. Proficiency in multiple languages supports intercultural competence by improving communication, challenging ingrained patterns of expression, and encouraging flexibility in thinking. Learning new languages fosters alternative ways to interact and deepens cultural understanding [32].

Additionally, students with minimal prior exposure demonstrated larger improvements ($p = 0.053$), likely because their lower starting point allowed for a steeper learning trajectory throughout the course.

The favorable responses to the simulated patient training session highlight its effectiveness in providing students with practical opportunities to apply newly learned skills in realistic clinical scenarios [33]. This hands-on learning strategy promotes a deeper appreciation of cultural diversity and its implications for patient care, equipping students to approach real-world clinical situations with confidence, sensitivity, and competence.

Evidence suggests that educational programs aimed at enhancing intercultural competence among healthcare professionals can reduce stress and anxiety for both patients and providers [34]. Despite these benefits, integrating cultural competence into medical school curricula remains challenging due to limited resources, time constraints, and competing educational priorities. Addressing these barriers requires greater exchange of experiences and best practices among European medical schools [13]. In Germany, these challenges remain insufficiently addressed, as there is no standardized communication curriculum within the medical education framework [11], and few German research groups have explored this topic in depth.

Fischer *et al.* emphasize that fostering awareness of individual, regional, cultural, and denominational differences, along with adopting a nuanced approach to patient interactions and collaborating with hospital chaplains, can significantly enhance doctor-patient relationships [35]. This is particularly important when engaging with patients of diverse religious backgrounds in Germany's largely secular society [35]. Klatzer's Bachelor's thesis highlights that delivering transcultural care extends beyond formal training [36]. It requires a comprehensive institutional commitment to openness and cultural transformation at all levels. This includes actively involving migrants in communicating their preferences for treatment and care, while ensuring that staff practices and organizational policies reflect a transcultural orientation. The goal is not to create standardized models for transcultural care, but to integrate these principles effectively into existing care frameworks [36].

Overall, the literature emphasizes the urgent need to embed intercultural education within German medical curricula. While discussions about incorporating interculturality into medical training exist, practical implementation is limited, often occurring only at the individual level within specific institutions. This gap signals the need for systematic approaches to develop intercultural competence among medical students. Currently, there is limited interest across German faculties in prioritizing this area, and comprehensive guidelines outlining essential topics for intercultural training are lacking. Without deliberate efforts to bridge the gap between theory and practice and institutionalize intercultural competence training, healthcare professionals may struggle to navigate culturally diverse patient populations effectively. Addressing these shortcomings is essential to ensure equitable and culturally sensitive healthcare delivery, and frameworks such as the NKLM may offer opportunities for advancing this agenda in Germany.

As with many medical education initiatives in Germany, our course is currently optional. Nevertheless, through our teaching approach and research, we directly address these challenges and lay the foundation for further exploration of intercultural competence in medical education. The findings reported here provide strong support for the potential integration of such training into national curricula. Expanding the course to include a wider range of cultures and religious contexts will be critical to ensure inclusivity and maximize educational effectiveness.

While our educational approach and its assessment through customized questionnaires mark a significant step toward incorporating interculturality into German medical education, certain limitations in our study design must be acknowledged. For example, the bespoke questionnaire employed has not yet undergone validation. Additionally, the relatively small test group of 31 students may restrict the generalizability of our results. Although more students participated in the course overall, not all chose to join the study, which could introduce selection bias. The lack of randomization in forming the control group raises questions about comparability, especially regarding motivation. It is possible that students in the test group, due to their greater interest in and familiarity with the subject, were more likely to enroll in the elective course, which might partially explain their higher performance on the CCCHP-27. Nevertheless, the overall high level of motivation among participants highlights the urgent need to integrate cultural competence training more broadly into German medical curricula to address the needs of an increasingly diverse patient population.

Future studies incorporating larger and more diverse samples, randomized control designs, and validated assessment tools could provide deeper insights into the effectiveness of such interventions and inform the development of improved educational strategies in this area.

Conclusion

The newly implemented teaching approach effectively enhances medical students' intercultural competencies, particularly in practical skills. Given the importance of this topic in a culturally diverse society, such training should be incorporated into medical curricula nationwide rather than remaining limited to optional courses, as is currently the case.

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