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Exploring gender disparity in medicine: perceptions of female physicians in Lebanon

Sibelle Kassouf^{1†}, Elma Nassar^{1†}, Hassan Cherri¹, Shaza Mortada¹, Kamar Eid¹, Leen Khalife¹, Aimee Daccache¹ and Aniella Abi-Gerges^{1*†}

Abstract

Background Global research on gender bias has highlighted key trends in discrimination and inequality across various fields, including medicine. In Lebanon, a nation celebrated for its diverse cultural landscape and increasing female representation in medical education, there has been a notable absence of studies exploring gender dynamics in the medical profession.

Methods To address this gap, we conducted a cross-sectional study using an online survey to explore the Lebanese population's perceptions towards female physicians and the quality of care they provide.

Results The mean age of the study sample ($n = 330$) was 31.55 ± 10.07 years and included 114 females and 216 males. Most respondents had received care from a female physician. Notably, those who selected female physicians as their family doctors or had female doctors within their immediate family displayed a stronger tendency to engage in annual medical check-ups. While most respondents did not express any preference for the gender of their general practitioner or surgeon, there was a marked preference for female obstetricians/gynecologists, psychiatrists, pediatricians, and dermatologists. This preference was attributed to perceptions of female physicians being particularly compassionate, understanding, and proficient in communication.

Conclusion This study represents a groundbreaking contribution to understanding gender perceptions in the Lebanese medical field. It highlights the growing trust and positive regard for female physicians, underscoring the significant role in shaping healthcare experiences and outcomes in Lebanon.

Keywords Female physician, Medicine, Gender discrimination, Perceptions, Preference, Lebanon

[†]Sibelle Kassouf and Elma Nassar contributed equally to this work.

*Correspondence:

Aniella Abi-Gerges
aniella.abigerges@lau.edu.lb

¹Gilbert and Rose-Marie Chagoury School of Medicine, Lebanese American University, P.O. Box 36, Byblos, Lebanon



Introduction

Until 1970, women accounted for only a tenth of medical schools enrollees in the United States (US). However, with the rise of the women's rights movement, female enrollment significantly increased [1], and by 2019, 50.5% of US medical students were women [2]. Despite this progress, women remain underrepresented in the medical workforce and face many challenges in entering residency, advancing in academia, and achieving leadership positions with decision-making and budgetary power [3]. These challenges include gender bias in promotions, salary inequity, professional isolation, bullying, sexual harassment, and lack of recognition [4, 5].

Gender discrimination, defined as exclusion or restriction based on socially constructed gender roles [6], affect women throughout their medical careers. Stereotypical perceptions portray them as emotionally driven and often place them in caregiving roles [7]. These biases do not disappear with age or seniority [8]. Sexist conduct within the medical field contributes to higher rates of attrition, burnout [9], and suicidal thoughts among women physicians [10]. Gender biases also influence specialty preferences, with greater gender segregation occurring by the fourth year of medical school [11–13]. Women are more likely to enter obstetrics and gynecology (ObGyn), pediatrics, and dermatology, while surgical specialties and radiology remain male-dominated [14, 15], despite surgery being popular among both genders at matriculation [16]. Furthermore, many women physicians report changing specialties or leaving the profession [17] due to harassment and mistreatment by superiors, colleagues, patients and their families [18, 19], thus affecting their careers and patient care [20]. Global gender-based disparities in medical specialty choices have been observed in the US [21], Sweden [22], the Netherlands [23], Mexico [24], China [25], Japan [26], and especially in Arab nations, where patriarchal culture predominates [27, 28]. By addressing these challenges with gender equity policies, the medical field can continue to make strides toward a more inclusive and supportive environment for women.

The Arab world is culturally diverse, shaped by historical, religious and ethnic factors [29]. Despite this diversity, traditional gender roles persist, with men being often seen as primary earners and decision-makers and women as caregivers [30–32]. Lebanon, known for its complex socio-cultural and political diversity and for blending Arab and Western values [33, 34], ranks poorly on gender equality indices [35]. The 2023 Global Gender Gap Report placed Lebanon 132nd for gender equality and 127th for economic participation and opportunity out of 146 countries, despite scoring high in educational attainment for women [35]. The country also scores low in political empowerment for women [35]. This disparity

is partly due to the misinterpretation of laws, patriarchal mindsets, and political sectarianism which often marginalizes women and limits their opportunities for political or economic power [36–38]. In the medical field, gender disparities are also evident [39]. As for recent estimates, Lebanon has around 15,429 registered physicians, with 78.2% being male and 21.8% female [39]. While progress has been made, challenges remain. A 2006 study revealed that 61% of Lebanese male practitioners pursued high-level medical specialties, whereas most female physicians were general practitioners, with few specializing in surgery [40]. Although women now account for a small percentage of surgeon population in Lebanese hospitals, significant gaps remain in fields like neurosurgery, oncological surgery, and vascular surgery [39]. The underrepresentation of Lebanese female physicians extends beyond surgical disciplines, as highlighted by a former female cardiologist who faced significant pressures and challenges in male-dominated field [41]. Efforts are growing to address gender disparities and support women in medicine. By promoting gender equity and supportive policies, Lebanon and other Arab countries can continue to make strides towards a more balanced and equitable workforce, creating opportunities for women to thrive in various medical specialties and leadership roles.

The present study aims to understand perceptions of the role of women physicians in the Lebanese community. We assessed public preferences regarding physician gender by medical specialty and evaluated perspectives towards women physicians' medical knowledge judgment, communication skills, professionalism, compassion, time management, patient care, and equal pay. We then identified associations between (1) the respondents' medical history and sociodemographic factors (gender, origin, marital status, and occupation) and (2) the public perceptions of female physicians' social and professional roles with the gender, origin and presence of a female physician in the family. To the best of our knowledge, this is the first study that provides novel data on gender disparities in medicine and the level of trust the Lebanese population has in female practitioners and the medical care they provide. Gaining a better understanding on how Lebanese society views female doctors may uncover the causes underlying gender disparities in medicine and provide women with better insights into their career decisions.

Methods

Study design and sample

A cross sectional snowball sample of 330 adults aged between 18 and 70 years old was recruited from the general Lebanese population during the period between May to June 2020 through an anonymous online survey that required 10–15 min to be completed. The online survey,

which was created, using Google Forms platform, was distributed through social media channels, such as Facebook, LinkedIn and WhatsApp. All data was obtained upon consent and was kept anonymous.

Table 1 Characteristics of the study population ($n=330$)

Age (Years): Mean \pm Standard Deviation	31.55 \pm 10.07
	N (%)
Socio demographics	
Gender	
Male	216 (65.5)
Female	114 (34.5)
Origin	
Beirut	27 (8.2)
Beqaa	31 (9.4)
Mount Lebanon	102 (30.9)
North Lebanon	95 (28.8)
South Lebanon	75 (22.7)
Marital Status	
Single	213 (64.7)
Married	113 (34.4)
Widowed/Divorced/Separated	3 (0.9)
Education	
Elementary school	4 (1.2)
High school degree	16 (4.9)
Technical/Vocational school	10 (3.0)
Bachelor's degree	113 (34.2)
Higher studies	187 (56.7)
Occupation	
Administrative	66 (20.1)
Literary/Education/Research	59 (17.9)
Engineering/Architecture/Design/Arts	33 (10.0)
Healthcare	38 (11.6)
Student	80 (24.3)
Unemployed	53 (16.1)
Income	
Low (< 20,000,000 LBP)	74 (37.9)
Middle (20,000,000–50,000,000 LBP)	69 (35.4)
High (> 50,000,000 LBP)	52 (26.7)
Have any female physician in the family	
Yes	147 (44.5)
No	183 (55.5)
Medical history	
Present for yearly medical checkups	
Yes	180 (55.0)
No	147 (45.0)
Ever had a family doctor	
Yes	187 (57.2)
No	140 (42.8)
Ever being treated by a female physician	
Yes	263 (79.7)
No	67 (20.3)
Ever being hospitalized for a surgery	
Yes	169 (51.2)
No	161 (48.8)

Questionnaire

The online self-administered questionnaire was developed based on the literature [42] and was written in English. It consisted of 48 questions that were either closed-ended or employed 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) (**Supplementary Material**). The first part of the questionnaire comprised 12 closed-ended questions that focused on gathering information about the participants' socio-demographic characteristics, their medical history, whether they have been treated by a female physician, the gender of their family doctor if any and the existence of a female doctor in their family (Tables 1 and 2). The second part assessed the attitudes of the respondents toward the role of women physician in patient care while investigating four measures: (1) the public preference regarding the gender of the general practitioner and surgeon [4 closed-ended questions, Table 3]; (2) the social and professional perceptions of female physicians and their right for equal pay [4 closed-ended questions (Table 3)]; (3) the specialty preference based on the physician's gender [15 closed-ended questions, Table 4]; and (4) the public perception regarding key female physician qualities such as competence, professional capabilities, knowledge, empathy, and communication skills [11 questions employing 5-point Likert scale, Table 5].

The beginning of the questionnaire included an informative introduction that clearly states the purpose of the research and emphasizes important criteria for participants' consent such as voluntary participation, confidentiality and anonymity of the information. The survey was accessible exclusively to individuals who consented to this study. The contact information of the principal investigator/ corresponding author of this study and the Institutional Review Board (IRB) committee at the Lebanese American University (LAU) were also included should the respondent wish to ask questions or withdraw from the study.

The English questionnaire was translated to Arabic and back-translated to English for consistency and validity by a certified translator, as previously reported [43, 44]. The questionnaire was then pilot-tested on a sample of 20 individuals. The resulting data were not included in the final analysis but were rather used to assess clarity, readability, cultural relevance of both language versions, as well as to estimate the time needed for questionnaire completion. Consequently, the questionnaire was edited before its online administration. The consenting participants were given the flexibility to choose between English and Arabic based on their comfort and preference. The study was approved by the IRB committee at LAU under the code number *LAU.SOM.AGI.10/Mar/2020*.

Table 2 The population's health-seeking behavior in relation to its demographics

	Present for yearly medical checkups		Ever had a family doctor		Ever being treated by a female physician	
	N (%)	χ^2 , p value	N (%)	χ^2 , p value	N (%)	χ^2 , p value
Gender						
Male	50 (43.9)	$\chi_1^2 = 8.17$,	129 (60.6)	$\chi_1^2 = 2.46$,	89 (78.1)	$\chi_1^2 = 0.15$,
Female	130 (61.0)	$p = .004$	58 (50.9)	$p = .116$	174 (80.6)	$p = .697$
Total	180 (55.0)		187 (57.2)		263 (79.7)	
Origin						
Beirut	13 (48.1)	$\chi_4^2 = 5.96$,	18 (66.7)	$\chi_4^2 = 17.56$,	13 (48.1)	$\chi_4^2 = 9.39$,
Beqaa	13 (41.9)	$p = .202$	10 (32.3)	$p = .001$	13 (41.9)	$p = .052$
Mount Lebanon	57 (56.4)		70 (69.3)		57 (56.4)	
North Lebanon	49 (52.1)		46 (48.9)		49 (52.1)	
South Lebanon	48 (64.9)		43 (58.1)		48 (64.9)	
Total	180 (55.0)		187 (57.2)		180 (55.0)	
Marital Status						
Single	94 (44.5)	$\chi_1^2 = 24.62$,	113 (53.5)	$\chi_1^2 = 2.03$,	158 (74.2)	$\chi_1^2 = 9.54$,
Married	83 (74.1)	$p < .001$	70 (62.5)	$p = .154$	101 (89.4)	$p = .002$
Total	177 (54.8)		183 (56.7)		259 (79.4)	
Occupation						
Administrative	41 (64.1)	$\chi_5^2 = 14.87$,	44 (68.7)	$\chi_5^2 = 5.07$,	58 (87.9)	$\chi_5^2 = 11.48$,
Literary/Education/Research	32 (55.2)	$p = .011$	31 (53.4)	$p = .407$	45 (76.3)	$p = .043$
Engineering/Architecture/Design/Art	13 (39.4)		17 (51.5)		24 (72.7)	
Healthcare	28 (73.7)		19 (50.0)		36 (94.7)	
Student	35 (43.8)		46 (57.5)		59 (73.8)	
Unemployed	30 (56.6)		30 (56.6)		41 (77.4)	
Total	179 (54.9)		187 (57.4)		263 (79.9)	
Ever had a family doctor						
Yes	118 (63.1)	$\chi_1^2 = 10.71$,	-	-	-	-
No	62 (44.3)	$p = .001$	-	-	-	-
Total	180 (55.0)		-	-	-	-
Gender of the family doctor						
Male	70 (54.7)	$\chi_1^2 = 11.22$,	-	-	-	-
Female	48 (81.4)	$p = .001$	-	-	-	-
Total	118 (63.1)		-	-	-	-
Female physicians in the family						
Yes	91 (62.3)	$\chi_1^2 = 5.13$,	-	-	-	-
No	89 (49.2)	$p = .023$	-	-	-	-
Total	180 (55.0)		-	-	-	-

 $\chi^2 = \text{Chi-square}$

Sample size calculation

An a priori power analysis for a chi-square test was conducted using the R library "pwr" to determine the minimum sample size required. Results indicated the required sample size to achieve 80% power for detecting medium effect, at a significance criterion of $\alpha = 0.05$, was $N = 267$.

Statistical analysis

The statistical analysis was conducted using R version 4.2.2. The sample characteristics were reported as frequencies and percentages. Pearson's chi-square independence test was used to evaluate the association between sociodemographic factors (gender, origin, marital status, occupation, having a family doctor, gender of the family

doctor if any, the existence of female physicians in the family) and health-seeking behaviors (yearly checkups, having a family doctor, being treated by a female physician). Similarly, Pearson's chi-square test was conducted to assess the association between gender and attitudes towards female physicians, as well as between participant's gender and physician's preferred gender by specialty. Fisher's exact test was adopted instead of Pearson's test when more than 20% of the expected values in cells were less than 5. When the studied variables were both binary, an odds ratio (OR) was calculated with a 95% confidence interval. Mann Whitney test was performed to examine whether females and males have different perceptions of the professional attributes and clinical skills

Table 3 Participants' perception of female physicians by gender

	Men N (%)	Women N (%)	Total N (%)	Statistical Association
Do you prefer to be treated by a male or a female general practitioner?				
Male	12 (10.5)	11 (5.1)	23 (7.0)	$\chi^2 = 9.12,$ $p = .01$
Female	9 (7.9)	40 (18.6)	49 (14.9)	
No preference	93 (81.6)	164 (76.3)	257 (78.1)	
What was the gender of the surgeon if you have undergone a surgery before?				
Male	49 (81.7)	74 (67.9)	123 (72.8)	$\chi^2 = 5.44,$ $p = .066$
Female	2 (3.3)	15 (13.8)	17 (10.0)	
Both	9 (15.0)	20 (18.3)	29 (17.2)	
In case you had the choice to choose the gender of the surgeon, what would have been your preference?				
Male	26 (22.8)	26 (12.2)	52 (15.9)	$\chi^2 = 11.78,$ $p = .003$
Female	5 (4.4)	30 (14.1)	35 (10.7)	
No preference	83 (72.8)	157 (73.7)	240 (73.4)	
Would you encourage your sister/wife/daughter to become a doctor?				
Yes	59 (51.8)	89 (41.2)	148 (44.8)	$\chi^2 = 4.21,$ $p = .122$
No	4 (3.5)	5 (2.3)	9 (2.7)	
It's her choice	51 (44.7)	122 (56.5)	173 (52.5)	
Do you think that women are capable of holding key positions in the society?				
Yes	111 (97.4)	211 (99.1)	322 (98.5)	$\chi^2 = 0.51,$ $p = .474$
No	3 (2.6)	2 (0.9)	5 (1.5)	
Do you think that women should be paid equally as men for the same job they do?				
Yes	107 (93.9)	212 (99.5)	319 (97.6)	$\chi^2 = 7.77,$ $p = .005$
No	7 (6.1)	1 (0.5)	8 (2.4)	

$\chi^2 = \text{Chi-square}$

Table 4 Specialty preference of physician's gender by participants' gender

	Men N (%)	Women N (%)	Total N (%)	Statistical Association
Psychiatry				
Male	17 (15.2)	13 (6.0)	30 (9.2)	$\chi^2 = 8.81,$ $p = .012$
Female	32 (28.6)	83 (38.6)	115 (35.2)	
No preference	63 (56.2)	119 (55.4)	182 (55.6)	
Dermatology				
Male	13 (11.7)	17 (7.9)	30 (9.2)	$\chi^2 = 8.38,$ $p = .015$
Female	22 (19.8)	75 (35.1)	97 (29.8)	
No preference	76 (68.5)	122 (57.0)	198 (61.0)	
ObGyn				
Male	12 (11.0)	30 (14.1)	42 (13.0)	$\chi^2 = 15.73,$ $p < .001$
Female	29 (26.6)	99 (46.5)	128 (39.8)	
No preference	68 (62.4)	84 (39.4)	152 (47.2)	
Urology				
Male	50 (45.0)	26 (12.2)	76 (23.4)	$\chi^2 = 57.31,$ $p < .001$
Female	4 (3.6)	61 (28.5)	65 (20.0)	
No preference	57 (51.4)	127 (59.3)	184 (56.6)	
Pediatrics				
Male	3 (2.7)	22 (10.5)	25 (7.8)	$\chi^2 = 6.11,$ $p = .047$
Female	31 (27.9)	54 (25.7)	85 (26.5)	
No preference	77 (69.4)	134 (63.8)	211 (65.7)	

$\chi^2 = \text{Chi-square}$

of female physicians, and to assess whether participants with female physicians in their family in these same perceptions compared to those without. To study mean differences in perceptions across origin, a Kruskal-Wallis test was performed and followed by Wilcoxon post hoc pairwise comparison test, whenever the Kruskal-Wallis statistic was significant. For all the tests that were conducted in this study, a p -value less than 0.05 was considered statistically significant.

Results

Characteristics of the study population

Three hundred thirty Lebanese respondents consented to participate in this study, with an average age of 31.55 ± 10.07 . Of these, 114 were females (34.5%) and 216 were males (65.5%). The general characteristics of the study population are presented in Table 1. The majority of the respondents were single (64.7%), while 34.4% were married, and only 0.9% were widowed, divorced, or separated. This category, being very poorly represented in our sample, was excluded from the statistical analysis involving marital status. In terms of education, 56.7% had pursued higher studies (e.g. MS, MD, and PhD), 34.2% had completed a bachelor's degree, and the remaining participants held degrees from technical/vocational schools (3.0%), high schools (4.9%), or elementary schools (1.2%). Less than half of the participants (44.5%) reported having

Table 5 Perception of professional attributes and clinical skills in female physicians
Perception of female physicians questions

	Gender		Have any female physician in the family	
	Mean ± SD (Female vs. Male)	p-value ^a	Mean ± SD (Yes vs. No)	p-value ^a
Professional attributes				
Female doctors are more compassionate about their patients than male doctors	3.63 ± 0.92 vs. 3.50 ± 0.86	p = .211	3.74 ± 0.83 vs. 3.46 ± 0.94	p = .017
Female doctors are more understanding than male doctors for their patients' psychological situation	3.69 ± 0.95 vs. 3.38 ± 0.80	p = .001	3.71 ± 0.90 vs. 3.48 ± 0.91	p = .178
Female doctors are more capable of communicating with patients than male doctors	3.77 ± 0.98 vs. 3.47 ± 0.92	p = .005	3.71 ± 0.96 vs. 3.63 ± 0.96	p = .871
Female doctors are better listeners than male doctors	3.88 ± 0.96 vs. 3.56 ± 0.90	p = .003	3.90 ± 0.88 vs. 3.66 ± 1.00	p = .267
Female doctors are more cooperative with their patients than male doctors	3.77 ± 0.97 vs. 3.43 ± 0.82	p = .001	3.74 ± 0.87 vs. 3.58 ± 0.98	p = .085
Clinical Skills				
Female doctors are more knowledgeable and skillful in their specialties than male doctors	3.47 ± 0.96 vs. 3.27 ± 0.90	p = .056	3.54 ± 0.96 vs. 3.29 ± 0.91	p = .060
Female doctors are more capable of dealing with threatening conditions than male doctors	3.63 ± 1.00 vs. 3.31 ± 0.95	p = .008	3.62 ± 0.98 vs. 3.43 ± 1.00	p = .081
Female doctors are incapable of handling the workload and responsibilities of being a doctor	1.74 ± 1.00 vs. 1.87 ± 0.98	p = .129	1.79 ± 1.06 vs. 1.78 ± 0.95	p = .369
Female doctors are unavailable upon need due to family commitments and/or pregnancy	2.31 ± 1.18 vs. 2.32 ± 1.27	p = .914	2.27 ± 1.23 vs. 2.35 ± 1.19	p = .087
Female doctors are emotionally driven in their medical judgment and treatment of patients	2.07 ± 1.09 vs. 2.24 ± 1.26	p = .385	2.11 ± 1.18 vs. 2.14 ± 1.13	p = .212
Female doctors do not have the physical strength needed for various medical settings as surgery	1.92 ± 1.12 vs. 2.25 ± 1.30	p = .046	1.94 ± 1.18 vs. 2.11 ± 1.21	p = .196

^aMann-Whitney Test

female physicians in their families. The study sample exhibited diversity in terms of geographic origin, professional occupation, and income level.

Health-seeking behaviors of the surveyed population

We first assessed the healthcare-seeking behaviors of the participants and examined the factors influencing them (Table 2). Upon obtaining the participants' medical history, we found that over half of them (57.2%) had a family doctor, 55.0% visited their doctor annually for checkups, and the majority (79.7%) had received care from a female physician (Table 1). Our findings indicate that women (61.0%) undergo annual medical check-ups more frequently than men do (43.9%, p=.004). This trend was even more prevalent among married individuals compared to single participants (74.1% vs. 44.5%, p<.001). Disparities in presenting for yearly checkups were also observed across different occupations (p=.01). Moreover, participants who reported having a family doctor (63.1%), particularly a female family doctor (81.4%) as well as a female doctor within their immediate family (62.3%) were more inclined to undergo yearly medical check-ups compared to those who don't (p<.05) (Table 2).

We noted a significant association between the region of residence and the likelihood of having a family doctor (p=.001). (Table 2). When asked about the gender of their family doctor, the prevalence of respondents who reported choosing a female family physician for their medical care was higher among those who have a female doctor in their family (40.7%) compared to those who don't (23.8%; p=.02). Moreover, marital status (89.4% married vs. 74.2% single participants were treated by a female physician, p=.002) and occupation (p=.043) were significantly related with ever being treated by a female physician (Table 2).

Attitude of the participants towards female physicians

Table 3 displays the attitudes of both male and female participants toward female physicians. While the majority of participants (78.1%) expressed no gender preference for their general practitioner, a proportion of female respondents exhibited a preference for female physicians (18.6% choosing female physicians vs. 5.1% choosing male physicians), while a number of men seemed to prefer male physicians (10.5% choosing male physicians vs. 7.9% choosing female physicians) (p=.01). Similar responses were obtained when participants were asked about their preference for the gender of surgeons (p=.003), despite the fact that most men (81.7%) and women (67.9%) had previously undergone surgeries performed by male surgeons (p=.06). The preference for male surgeons over female surgeons can be attributed to the belief that male surgeons possess greater knowledge and experience than

female surgeons, as indicated by 31.9% and 26.4% of participants, respectively, who preferred male surgeons.

Participants were then asked whether they would encourage their sister, wife, or daughter to pursue a career in medicine. Irrespective of their gender, respondents either expressed support for their female relatives' aspirations (44.8%) or respected their autonomy in making that choice (52.5%, $p=.122$) (Table 3). Over 90% of participants agreed that women are capable of holding key positions in society and should receive equal pay for equal work compared to men. However, the prevalence of women supporting equal pay was higher compared to men (99.5% of women vs. 93.9% of men, OR [95%CI]: 0.07 [0.001–0.58], $p=.003$) (Table 3).

Specialty preference according to the physician's gender

Although a majority of the participants (57.2%) indicated no gender preference for medical specialties, our findings reveal that both men and women would still choose a female physician for medical care in the fields of psychiatry (35.2% preferring female psychiatrist vs. 9.2% preferring male psychiatrist), dermatology (29.8% vs. 9.2% preferring male dermatologist), ObGyn (39.8% vs. 13.0% preferring male ObGyn), and pediatrics (26.5% vs. 7.8% preferring male pediatrician) (Table 4). However, men tend to prefer male over female urologists (45.0% of men participants chose male urologists vs. 3.6% preferring female urologists), while women show a preference for female urologists (28.5% of female participants vs. 12.2% preferring male urologists) ($p<.001$).

Perception of professional attributes and clinical skills in female physicians

The participants' perception of the professional qualities and clinical competencies of female doctors were assessed, and responses are presented in Table 5, categorized by participants' gender, origin, and whether they have female physicians in their families.

Regarding the doctor's professional traits, female participants expressed that female physicians excel in understanding patients ($p=.001$), effective communication ($p=.005$), active listening ($p=.003$), and cooperation ($p=.001$) compared to male physicians. However, there were no reported differences in these aspects between female and male doctors based on participants' geographic origin. Respondents with female physicians in their families perceived female doctors as more compassionate toward their patients ($p=.017$), but otherwise, they did not significantly differ from male doctors with respect to the other attributes.

In terms of clinical capabilities, both men and women agreed that female doctors are competent in fulfilling their medical duties. Female respondents believed that female physicians are more capable of dealing with

critical conditions ($p=.008$). However, men believed that female doctors may lack the physical strength required for certain medical procedures, including surgery ($p=.046$).

Additionally, participants from North Lebanon perceived female physicians as incapable of handling heavy workload (North Lebanon 2.06 ± 1.08 , Mount Lebanon 1.57 ± 0.93 , $p<.001$), less available (North Lebanon 2.74 ± 1.25 , Mount Lebanon 2.13 ± 1.14 , South Lebanon 2.06 ± 1.11 , $p<.001$), might be emotionally driven (North Lebanon 2.50 ± 1.26 , Mount Lebanon 1.79 ± 0.96 , South Lebanon 1.98 ± 1.05 , $p<.001$), and could lack the physical strength needed for medical interventions (North Lebanon 2.34 ± 1.27 , Mount Lebanon 1.69 ± 1.07 , $p<.001$) compared to respondents from Mount and South Lebanon.

Discussion

Gender discrimination in medicine, is a pervasive issue that transcends geographical boundaries and affects healthcare systems worldwide. Despite advancements in medical education and technology, disparities between male and female healthcare professionals persist in various aspects of the field [5, 45]. This study aims to shed light on the multifaceted nature of gender disparities in medicine in Lebanon, exploring its manifestations while assessing the public perceptions of female physicians. The novel findings of this study support increased female representation in medicine, though within the confines of gender-specific specialties.

Our participant cohort consisted of a highly educated population, with almost half of them reporting the presence of a female physician in their family, which had a positive perception that affected our findings. Participants with a female physician relative were nearly twice as likely to choose a female family doctor and to present for regular physical exams. This suggests that having a female physician in the family serves as a role model that extends beyond the selection of female healthcare providers; it encourages proactive healthcare-seeking behaviors [46].

Among the study participants, the majority received medical care from female physicians and expressed no gender preference for their general practitioners. However, a different picture emerged in the context of surgical care. While most participants stated they had no preference regarding the gender of their surgeon, 72.8% had undergone surgeries performed by male surgeons. The conflicting results raise questions about the potential underrepresentation of females in surgical specialties or an unconscious bias against female surgeons, who may be perceived as less skillful. Indeed, studies have highlighted certain critical aspects of this issue. In fact, female surgeons have a higher likelihood of leaving their surgical

residency programs during their early years, mainly because of mistreatment, lack of support, and insufficient mentorship, leading to their underrepresentation [17, 47, 48]. Moreover, surgical careers are demanding and stressful, requiring complex skills [49], and female surgeons often feel pressured to outperform their male counterparts for equal recognition [50]. For instance, 66% of European female cardiothoracic surgeons had no children, compared to 19% of men [51], illustrating the tough choice between family and career. This pressure and fear of not meeting male standards can cause imposter syndrome among female surgeons [52, 53]. Thus, to explore the reasons for the preference for male surgeons, the present study asked participants about their choices. Most Lebanese respondents listed male surgeons' knowledge and skills (31.9%) and extensive professional experience (26.4%) as key factors, hence supporting previous findings [54]. Interestingly, the percentage of women in surgery fellowships in Iraq increased dramatically from 8.6 to 73.3% between 2009 and 2019, indicating a positive shift away from sexist ideologies in the Arab world [55].

Gender disparity extends beyond surgery to various medical specialties. Female patients were generally reported to prefer female healthcare providers for intimate care, while male patients usually prefer male physicians for intimate examinations [56]. These findings align with our data, where 46.5% of women preferred female ObGyn, while only 14.1% preferred male ObGyn, and 45.0% of men preferred male urologists with only 3.6% preferring female urologists. Similar findings were observed in a UAE study, showing preferences for same-sex physicians during intimate examinations, influenced by conservative cultural norms [57]. However, patients would favor male ObGyn for complex cases if assisted by a female colleague [57]. Interestingly, female urologists in Saudi Arabia report higher comfort and job satisfaction compared to female non-urologists [58]. There also appears to be a tendency to associate female doctors with communal specialties that require empathy, communication skills, and compassion, qualities in which they often excel compared to men [59]. This aligns with our findings, which show a preference among Lebanese respondents for female psychiatrists, pediatricians and dermatologists over their male counterparts. Despite this preference, the overall tendency towards neutrality underscores that the Lebanese population generally values the professional skills of physicians more than their gender. Studies have shown that women provide slightly better patient care compared to men [60, 61], while adhering to medical guidelines [62] and allocating more time to patients, thereby improving patient-oriented communication [9] and patient compliance [63]. While this notion found support mainly among the women in our sample population, a study conducted in Dubai in

2022 revealed that female physicians achieved the highest communication and shared decision-making scores with male patients, followed by female patients [64].

Persistent wage gap between male and female healthcare professionals is one of the most tangible forms of gender discrimination in medicine. While 97.6% of our sample supports equal pay for equal work, a 2020 report shows that female physicians are often clustered in lower-paid specialties and underrepresented in higher-paid ones [21]. The Medscape Physician Compensation Report for 2023 indicates male physicians earn 19% more than their female counterparts, with a 27% gap among specialists, although this represents a slight improvement from previous years [65, 66]. This wage gap persists even after adjusting for years of experience and working hours, as female physicians often work fewer hours due to caregiving responsibilities [67]. Women in the same specialties as men, including surgery, earn less even with similar training and working hours [68]. This wage disparity extends to medical literature [69] and leadership positions [70–72]. Despite an increase in female medical graduates, women remain scarce in high-ranking roles such as department chairs, deans, and hospital executives, illustrating the “leaky pipeline phenomenon” [73]. Consistent with global trends, Arab countries show a 24% wage gap and underrepresentation of women in high-paying and leadership roles [74], however progress is noted. In Egypt and Jordan, although the gender pay gap remains notable in both the health sector [74] and other fields [75], these disparities are linked to lower Gender Development Index (GDI) scores, which highlight areas for growth in life expectancy, education, and income [75]. However, Arab nations with more advanced economies, such as the UAE, Qatar, and Saudi Arabia, have made significant strides with high scores on the gender wage gap indicator [35], thanks to their proactive policies aimed at reducing wage disparities and enhancing women's workforce participation [76, 77]. In Lebanon, efforts are underway to address wage differentials, which are influenced by both discrimination and human capital factors. While challenges remain, progress is evident as more qualified women continue to break barriers and pursue equal earnings [78, 79]. Furthermore, Harb et al. note that social capital positively impact men's earnings at lower income levels but poses challenges at higher levels due to supporting relatives [79].

Subtle biases and stereotypes can influence how patients, colleagues, and superiors perceive and treat healthcare professionals based on gender. Women may face challenges related to their competency, commitment or emotional stability. Indeed, female doctors, who often work fewer hours to balance family and career responsibilities, may be undervalued and perceived as less committed, hence creating barriers to promotion and

professional recognition [50, 70]. This perception was supported by our findings where residents of North Lebanon believed that female doctors might struggle with workload and commitment to their medical profession due to caregiving responsibilities. Besides, they perceived them as emotionally driven and lacking the physical strength needed for medical interventions. This observation reflects conservative cultural views that some Lebanese individuals residing in North Lebanon [80] still hold regarding (1) the prominent role of women as wives and mothers and the necessity of prioritizing their caregiving responsibilities over their careers or personal aspirations [81] and (2) the incapacity of female doctors to excel in surgery because of their lack of physical strength. Despite this, our sample population largely agreed that women are capable of key societal positions and should receive equal pay for equal work.

To address these disparities, Stephens et al. recommend healthcare institutions implement a resolute zero-tolerance policy against discrimination and bias [82], establish mentorship and sponsorship programs for female residents, provide leadership training opportunities, and ensure fair and transparent promotion processes. To close the wage gap, salary transparency and regular audits are necessary, along with reassessing maternity leave policies to support female physicians as they balance their careers and family life. Implementing these measures can help create a more equitable and inclusive environment in medicine.

This research study presents several limitations and strengths. Our sample size was relatively fair, exceeding the minimum required to highlight gender disparities in medicine in Lebanon, a country with an estimated population of 5,204,221 in 2024 according to World Meter's elaboration of the latest United Nations data [83]. The study cohort was diverse, encompassing a wide range of socio-demographic variables, including origin and socioeconomic status. One significant limitation is that our participant cohort was highly educated, which may have introduced selection bias and resulted in more favorable perceptions of female physicians, potentially limiting the generalizability of our findings. Additionally, the survey might not have fully captured all aspects of perceptions regarding the role of female physicians, including their professional attributes and clinical skills. It also might not have accounted for the full spectrum of socio-cultural and religious diversity that is characteristic of Lebanon as well as the perspectives of individuals across all occupations, including homemakers. The use of a snowball sampling method may not accurately reflect the attitudes and perceptions of the broader Lebanese population toward female physicians. Furthermore, distributing the online questionnaire through social media may have excluded individuals without internet

access. Despite these limitations, the online survey and snowball sampling enabled data collection during the COVID19 pandemic and the Lebanese economic crisis with limited resources [44, 84, 85]. Our study aimed to understand Lebanese respondents' perceptions of female physicians and their preferences regarding a physician's gender, employing basic statistical tests to gain insights into societal views on female doctors. This research sheds light on gender disparity in medicine, a topic often overlooked in MENA academic circles, thus paving the way for future research. We recognize that multivariate analyses would have provided a more detailed understanding of how various factors influence preferences regarding a physician's gender and identified the strongest predictors of these preferences. As it stands, our results primarily reflect a prevailing neutrality towards physician gender among the Lebanese population. While this offers valuable insights into the general acceptance and potential indifference towards the gender of physicians, it does not provide definitive conclusions [86]. It is noteworthy that males (65.5%) were overrepresented compared to females (34.5%), whereas according to the Central Administration of Statistics in 2022, females make up 51.1% of the Lebanese population while males constitute 48.9% [87]. However, this higher number of males will not skew the overall neutrality observed towards physician gender. This neutrality might also be confounded by social desirability bias, where participants could have reported a lack of preference for physician gender to avoid social judgment, potentially leading to an overestimation of neutrality. Future research could benefit from employing strategies to mitigate social desirability bias, such as using indirect questioning techniques and ensuring anonymity, which was already maintained in this study.

Conclusion

Addressing gender discrimination in medicine is crucial for fostering a more inclusive and equitable healthcare system. By recognizing and actively working to eliminate disparities in pay, leadership opportunities, and workplace culture, the medical community can create an environment that values and utilizes the talents of all healthcare professionals, regardless of gender. Ultimately, a diverse and inclusive medical workforce contributes to improved patient care, innovation, and the overall advancement of the field. This study offers preliminary insights into the perceptions of the Lebanese population toward female physicians, thus addressing a gap in the existing literature. As an exploratory investigation, our findings suggest potential areas for further research rather than providing definitive conclusions. We believe that our data could (1) guide medical students in selecting their specialties and (2) help future female physicians gain insight into the attitudes and expectations of

Lebanese patients. Nonetheless, additional research is needed to explore the multifaceted factors shaping these perceptions and to develop targeted interventions to address gender disparities in medicine.

Abbreviations

AAMC	American Association of Medical College
GDI	Gender Development Index
IRB	Institutional Review Board
LAU	Lebanese American University
MD	Doctor of Medicine
MS	Master of Science
ObGyn	Obstetrics and Gynecology
OR	Odds Ratio
PhD	Doctor of Philosophy
UAE	United Arab Emirates
US	United States of America

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12909-024-06131-5>.

Supplementary Material 1

Acknowledgements

We thank Drs. Mohamad Abi Nassif, Tamara Fleihan, Jad Gerages Harb, and Habib Victor Hotait for their assistance with the data collection and Mrs. Katia Abi-Gerges for the Arabic translation of the questionnaire. We also thank Dr. Mary Deeb for her valuable scientific input.

Author contributions

SK contributed to data curation and interpretation, participated in drafting the original manuscript and were involved in reviewing & editing the manuscript. EN performed the statistical analysis and was involved in reviewing & editing the manuscript. HS and SM were involved in data acquisition, curation & interpretation, participated in drafting the original manuscript and were involved in reviewing & editing the manuscript. KE was involved in data acquisition and participated in drafting the original manuscript. LK and AD were involved in data acquisition and in reviewing & editing the manuscript. AA-G conceived, designed and supervised the research project, was involved in data curation & interpretation, writing, reviewing & editing the manuscript. All authors read and approved the final manuscript.

Funding

Not applicable.

Data availability

The dataset used and analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The study was approved by the Institutional Review Board, Graduate Studies and Research at the Lebanese American University under the code number LAU.SOM.AG1.10/Mar/2020. All methods were carried out in accordance with relevant guidelines and regulations. All participants provided informed consent.

Consent for publication

Not applicable.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the revision of this work, the authors used ChatGPT 3.5 to improve readability and language. After using this tool/service, the authors reviewed

and edited the content as needed and take full responsibility for the content of the publication.

Competing interests

The authors declare no competing interests.

Received: 24 March 2024 / Accepted: 4 October 2024

Published online: 23 October 2024

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