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Factors Influencing Migration Intentions of Undergraduate Medical Students: a Cross - Sectional Study from Two Egyptian Universities.

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Abstract

Background:
The global migration of health workers generally, and physicians particularly, is affecting the health systems of both source and destination countries. Egypt, a lower middle-income country, is significantly affected by the migration phenomenon, contributing to a national shortage of physicians. This study aims to examine the factors influencing the migration intentions among undergraduate medical students.

Methods:
A descriptive cross-sectional study was conducted among second to fifth year medical students at 2 Egyptian universities from October 2023 to May 2024. Data were collected using a self-administered online questionnaire. Data were analysed using descriptive statistics using the SPSS program, open-ended questions were analysed thematically using Atlas ti.

Results:
A total of 650 students participated in the survey. More than two-thirds of participants (68%) expressed a definite intention to emigrate after graduation, with 35.1% having already started planning for migration. Push factors (61%) were stronger than pull factors (39%), with financial considerations being the main driver. Almost half of students (47%) had already decided on their preferred destination, with the Arab Gulf countries being the most popular choice (34.5%). The culture of migration played a significant role facilitating the migration intentions.

Conclusions:
The majority of undergraduate medical students not only have a strong intention to migrate but have already started their preparations. This is largely driven by financial factors, with a notable culture of migration that further strengthens migration intentions. With the internationalisation of medical education, collaborative efforts are increasingly needed to develop an adequate and well-trained global medical workforce.

Keywords:
Migration intentions; Egyptian undergraduate medical students; Facilitators and barriers; Medical migration; Push and pull factors.

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Background

The international migration of health workers - particularly physicians - has emerged as a major global health issue, often described as a form of 'mass migration'. This trend has heightened concerns about the capacity of health systems worldwide, as both high-income countries (HICs) and low- and middle-income countries (LMICs) face persistent and growing shortages of health workers (1). Achieving the health-related Sustainable Development Goals (SDGs) depends heavily on the availability of a robust health workforce. The World Health Organization (WHO) estimates that at least 4.45 skilled health workers per 1,000 people are needed to achieve these goals. However, the current global workforce falls far short of this benchmark, with a projected shortfall of 17.6 million health workers, including 13.6 million in LMICs alone. By 2030, the global shortfall is expected to remain at 15 million (2, 3). This imbalance is exacerbated by migration patterns that follow economic gradients - typically from LMICs to HICs - exacerbating the labour crisis in source countries while temporarily alleviating it in destination countries (3, 4).

In response to the mass migration, the WHO adopted the Global Code of Practice on the International Recruitment of Health Personnel in 2010. The Code aimed to promote ethical recruitment practices and encourage investment in the sustainability of the health workforce, particularly in vulnerable countries of origin. However, evidence suggests that the Code has had limited effectiveness in curbing the drivers or consequences of health worker migration, pointing at the need for more robust policy implementation and international cooperation (5).

Africa bears a disproportionate share of the global burden of disease but has access to only a relatively small fraction of the global health workforce. The continent is responsible for about 25% of the global disease burden but is served by only 3% of the global health workforce, highlighting a critical mismatch between health needs and human resources (3). This imbalance is exacerbated by high rates of health worker migration, with some African countries losing up to 70% of their trained health workers. In particular, around 20% of African-born doctors are currently practising in high-income countries (HICs), exacerbating existing health system weaknesses across the region (3, 6).

Egypt, a lower-middle-income country, is emblematic of these challenges. Despite producing approximately 10,000 medical graduates annually from 36 public and private medical schools, the country faces a significant shortage of doctors. In 2020, Egypt is reported to have a physician density of just 6.8 per 10,000 populations - well below international benchmarks - due in large part to high emigration rates among medical graduates (4, 7-9). According to the Egyptian Medical Syndicate, there were 212,835 registered physicians in 2020, but 56% of them were working abroad, and only about 62,000 were actively working in public hospitals, serving a population of more than 110 million (8).

While numerous studies have examined the drivers of health professional migration, much of this work has focused on practicing clinicians. Less attention has been given to the intentions and motivations of medical students—those who represent the future of the workforce but may already be considering careers abroad. Exploring their perspectives can offer critical insights into emerging trends and inform more effective retention strategies. In this cross-sectional study, we investigate the migration intentions and underlying motivations of medical students at two Egyptian universities. By focusing on this early career stage, our research aims to capture evolving aspirations and decision-making processes that may influence future workforce patterns.

Physician migration can be examined at both macro and micro levels, each highlighting different aspects driving migration trends. At the macro level, migration is strongly influenced by globalisation and the 'brain drain' phenomenon, whereby the flow of skilled professionals to high-income countries parallels global economic integration (10). At the micro level, the push-pull framework provides insights into the personal motivations and constraints that influence the migration decisions of physicians and medical students in different global settings (4, 11-13). Push and pull factors are defined as factors that 'repel' and 'attract', respectively, the movement of health workers from or to a health system or country (14). In addition to the push and pull factors, there are other aspects that influence physician migration, such as facilitators and barriers, including labour market issues, cultural and linguistic issues, visa procedures, licensing and registration, and the social networks and culture of migration (4). Other theories include the person-environment fit theory that has been used to recognise the role of different occupational interests in social career choices (15). Overall, individual decisions about where to work are underpinned by a combination of career choice and migration theories (16).

Medical student migration is a global phenomenon, with a significant number of students studying medicine abroad, with students from high-income countries (HICs) and those from low- and middle-income countries favouring different destination countries (17). US and Canadian medical students migrate to the Caribbean; British, Swedish and Norwegian students migrate to Central and Eastern Europe; and African and South East Asian medical students migrate to Eastern Europe and East Asia on medical program taught in either English or the language of the host country (17). The migration of medical students represents a valuable potential workforce, both for the health systems of their home countries and for the global labour market (18). However, the career pathways vary considerably: while students from high-income countries (HICs) often return to their home countries to obtain medical licenses and practice medicine, students from low- and middle-income countries (LMICs) are almost equally likely to either return home or remain abroad in high-income countries to build their medical careers (19, 20).

Studies show that the prevalence of medical students expressing an intention to migrate varies widely, with reported prevalence rates ranging from 60.4% in Pakistan (14), 68.0% in Nigeria (21) and 70.7% in Turkey (1) to 80.6% in Serbia (22), 86.1 % in Kyrgyzstan (23), 85% and 63% in Jordan for a residency or fellowship abroad respectively (24) and reaching up to 94.18% in Ghana (25) and 95.5% in Lebanon (26).

Previous studies in Egypt have examined the migration intentions of physicians and final year medical students using both quantitative and qualitative approaches (3, 4, 27, 28). However, there remains a notable gap in the literature regarding the causes and mechanisms behind the migration of younger undergraduate medical students, particularly those in their second to fifth years of study.

Little is known about the educational experiences of future health professionals in their home countries, and even less about how migration decisions are made from the perspective of young (future) health professionals who have not yet migrated. The current study seeks to address this gap by examining the underlying factors that drive Egyptian medical students to migrate, particularly to the urban centres of Alexandria and Damietta, recognising that their experiences may differ from those of their counterparts in the Nile Delta region (29), and by providing evidence-based recommendations that could help to address this trend. The research question is "What are the key factors influencing the migration intentions of second to fifth year medical students at two Egyptian universities in Alexandria and Damietta?". This quantitative study is a complementary investigation to a recent qualitative article that explored the motivational factors of a group of final year medical students and residents in Egypt in preparation for migration to Germany (4).

Methods

Study design

This descriptive cross-sectional study was conducted between October 2023 and May 2024 during the academic year 2023/2024. It utilized a self-administered online questionnaire to explore migration intentions among undergraduate medical students.

Study Setting and Participants

The study involved undergraduate medical students from two Egyptian medical schools: the Faculty of Medicine, Alexandria University (Alexandria) and the Faculty of Medicine, Horus University (HUE, Damietta). Students from the second to fifth years at Alexandria University and second- and third-year students at Horus University were included. Horus University's program currently includes students up to the third year, given its recent establishment. Both institutions follow a competency-based medical education (CBME) curriculum aligned with Egypt's National Academic Reference Standards (NARS), consisting of five undergraduate years followed by two years of house officer training (30).

Sampling and recruitment

A stratified sampling technique was employed to ensure proportional representation from each academic year in both universities. Epi info version 7 (for population surveys or descriptive studies) was used to determine the minimum sample size required (n=366 in Alexandria Faculty of Medicine and n=173 in Horus University representing 54.5% of targeted students), taking into account the expected frequency 50%, acceptable margin of error 5%, design effect 1.0, and confidence level 95%. Twice the required minimum sample size was invited to participate in the University of Alexandria n=732, in order to increase accuracy and precision and to account for losses or non-response. Students were recruited through announcements on their universities' official social media platforms and online student groups.

Data collection instrument

The self-administered online questionnaire adapted from the findings of a qualitative study that examined the migration intentions of final year medical students and residents in Egypt was distributed via Google Forms (4). It included 40 closed and open-ended questions divided into four domains:

• Domain 1: Demographic and socio-economic characteristics (e.g., age, gender, education background, family and financial status).

• Domains 2–4: Migration intentions, influencing factors (push/pull), planning and direction, emotional aspects, and cultural perspectives on migration.

Validity and pilot testing

The process of validating the questionnaire involved assessing its content validity using expert judgement. Five experts in medical education, each with a master's or doctoral degree in the field, were invited to rate the relevance of the questionnaire items. They rated each item on a four-point scale from 'not relevant' to 'highly relevant'. To quantify content validity, the content validity ratio (CVR) was calculated for each item using Lawshe's formula, which measures the proportion of experts who consider an item essential (31). Given the number of experts, the minimum acceptable CVR was set at 0.99 to ensure statistical significance. Items with a CVR equal to or greater than this threshold were retained, indicating a strong consensus among experts regarding their essentiality, while items scoring below the threshold were either revised or excluded to improve the overall validity of the instrument. Experts were also asked to examine each question on a four-point scale to determine the clarity of the items. Afterward, we pilot tested the questionnaire with 16 medical students (not included in the study sample) to examine the face validity of items. According to their opinions,

necessary changes were applied for better comprehensibility. This tool provided both categorical and short-answer responses, facilitating quantitative analysis of demographic and attitudinal data, while also providing qualitative insights into motivations, concerns and expectations related to migration.

Data Analysis

Statistical analysis of the quantitative data was carried out using SPSS (Statistical Package for the Social Sciences) version 26. Descriptive statistics (frequencies and percentages) were calculated to summarise demographic characteristics and responses related to emigration intentions. A significance level of $p < 0.05$ was used for all statistical tests (chi-square tests were used to determine the reported p-values). Qualitative data from open-ended responses were analysed using thematic analysis using Atlas ti (a computerized indexing system, GmbH, Berlin, Germany) (32, 33). Following the thematic analysis approach based on Braun and Clarke (2006), in the first phase, familiarisation, all responses to open-ended questions were read repeatedly (34). In the second phase, initial codes were generated by systematically reviewing the data. The third stage involved organising the codes into potential themes by clustering related codes. In the fourth stage, themes were rigorously tested by assessing their coherence and consistency with both the coded extracts and the full dataset. The fifth stage was to define and name the themes. Finally, in the sixth stage, a summary report was produced, integrating illustrative data extracts and analytical commentary.

Ethical considerations

The study was conducted in accordance with the ethical standards of the Declaration of Helsinki and approved by the Ethics Committee of Alexandria Faculty of Medicine (serial number 0107790, IRB NO: 00012098, FWA NO: 00018699). The study was conducted in partial fulfilment of the Master of Medical Education degree of the author MA. Participation was voluntary, and written informed consent was obtained from all students. The confidentiality and privacy of student data were maintained throughout the study. In addition, the researchers ensured that participants had the right to withdraw at any stage without repercussions, and data were anonymised during analysis to prevent any possible identification of participants. Efforts were also made to minimise any psychological discomfort or coercion by providing clear information about the purpose and procedures of the study.

Results

Participants

A total number of 650 students from both universities participated in the survey, with 258 students from Horus University (81.6 % response rate from the 316 students invited) and 392 students from Alexandria University (53.6% response rate from the 732 students invited). The gender distribution was nearly balanced, with 50.3% of participants identified as male and 49.7% as female. The majority of respondents (60.3%) were aged between 22 and 25 years, while 39.1% were aged between 18 and 21 years. In terms of nationality, 91.5% of participants were Egyptian, with 8.5% identified as non-Egyptian. In terms of high school education, 76.3% of participants reported attending public schools, 11.5% private schools and 12.2% other types of schools. Demographic data of study participants is illustrated in Figure 1 and Table 1.

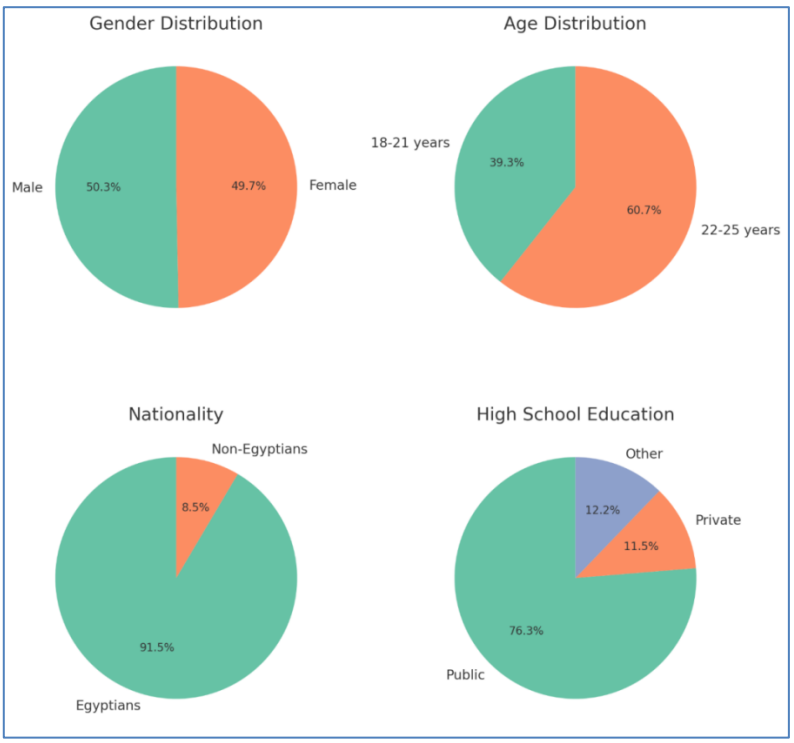

Fig. 1 Demographic data of study participants

Table 1: Distribution of the surveyed students (n=650) according to socio-demographic characteristics

	Alexandria University (n=392)		Horus University (n=258)		Total (N=650)		Test of significance
Gender	N	%	N	%	N	%	
Male	183	46.7	144	55.8	327	50.3	X^2=5.188 p=0.023*
Female	209	53.3	114	44.2	323	49.7	
Age (in years)							
18-21	106	27.0	148	57.4	254	39.1	X^2=60.11 p^{MC}<0.001*
22-25	283	72.2	109	42.2	392	60.3	
>25	3	0.8	1	0.4	4	0.6	
Nationality							
Egyptian	337	86.0	258	100.0	595	91.5	X^2=39.545 p<0.001*
Non Egyptian	55	14.0	0	0.0	55	8.5	
High school education							
Public	290	74.0	206	79.8	496	76.3	X^2=14.717 p=0.005*
Private	43	11.0	32	12.4	75	11.5	
IG	31	7.9	3	1.2	34	5.2	
American	8	2.0	4	1.6	12	1.8	
Others	20	5.1	13	5.0	33	5.1	

X^2: chi square test
p*: p-value is significant at level <0.05

A. Results of quantitative data

1.Migration intentions

The majority of students (91%) at both universities expressed an intention to leave Egypt to pursue a medical career abroad (definite intention 68 % and some intention 23 %). While 19% of participants indicated a preference for post-graduation migration, 9% expressed a preference for migration prior to graduation, which suggests an increased probability of emigration upon completion of their studies. In terms of the length of the intended stay abroad, both universities have an almost equal distribution of students considering either an indefinite (51.5%) or a limited (48.5%) stay abroad(Figure 2, Table 2).

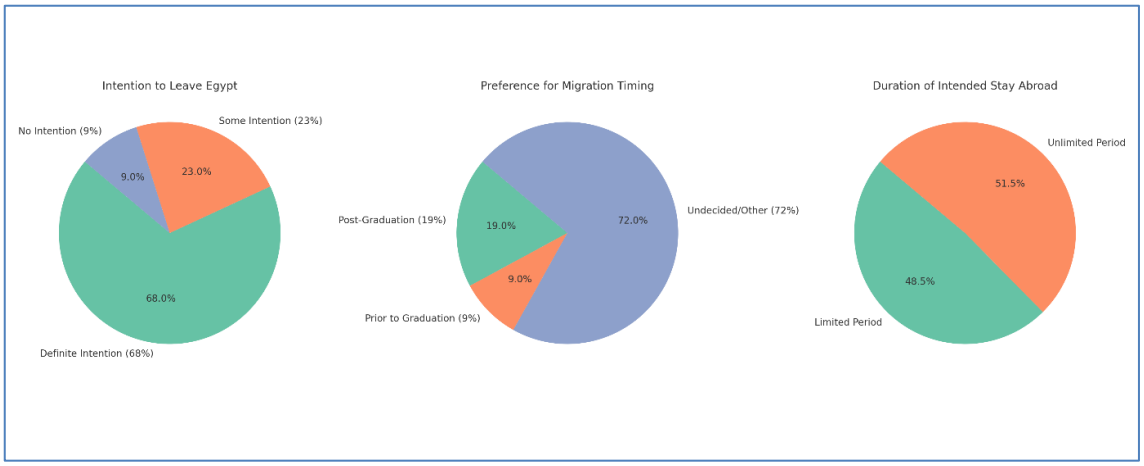

Fig. 2 Migration intention, timing preference and duration of intended stay abroad

Table (2): Distribution of the surveyed students (n=650) according to intention to migrate

	Alexandria University (n=392)		Horus University (n=258)		Total (N=650)		Test of significance
Have you ever considered leaving Egypt and working as a physician abroad?	N	%	N	%	N	%	
Not at all	5	1.3	6	2.3	11	1.7	X^2=2.441
Rather not	9	2.3	4	1.6	13	2.0	p=0.655
Don't know	21	5.4	15	5.8	36	5.5	
Rather yes	84	21.4	63	24.4	147	22.6	
Definitely yes	273	69.6	170	65.9	443	68.2	
How likely do you think that you will be going abroad after graduation?							
Not at all	140	35.7	2	0.8	142	21.8	X^2=303.362
Rather not	106	27.0	4	1.6	110	16.9	p<0.001*
Don't know	97	24.7	64	24.8	161	24.8	
Rather yes	27	6.9	84	32.6	111	17.1	
Definitely yes	22	5.6	104	40.3	126	19.4	
How likely do you think that you will be going abroad before graduation?							
Not at all	125	31.9	38	14.7	163	25.1	X^2=44.516
Rather not	95	24.2	39	15.1	134	20.6	p<0.001*
Don't know	112	28.6	115	44.6	227	34.9	
Rather yes	33	8.4	38	14.7	71	10.9	
Definitely yes	27	6.9	28	10.9	55	8.5	
If you are intending to travel abroad, how long are you intending to stay there?							
For a limited period of time	195	49.7	120	46.5	315	48.5	X^2=0.651
For an unlimited period of time	197	50.3	138	53.5	335	51.5	p=0.420

X^2: chi square test

p*: p-value is significant at level <0.05

2.Planning for migration

The majority of students surveyed (64.9%) have not yet started planning to migrate, while 35.1% have taken initial steps to migrate. Among those who have started planning, the most common step taken is learning the language of the destination country (32.8%), followed by scientific preparations (23.8%), such as studying for licensing exams such as the USMLE or PLAB. Social preparations, such as networking with colleagues who have already migrated, account for 19.5% of planning efforts, while financial preparations, such as saving money or working while studying, account for 13.8%. Cultural preparations, including learning about the culture and traditions of the destination country, account for 10.0% (Figure 3, Table 3). These results show that while most students are still in the early stages of considering migration, those who are actively planning to emigrate place considerable emphasis on acquiring the language and academic skills necessary for successful migration, with social and financial preparations also playing a notable role.

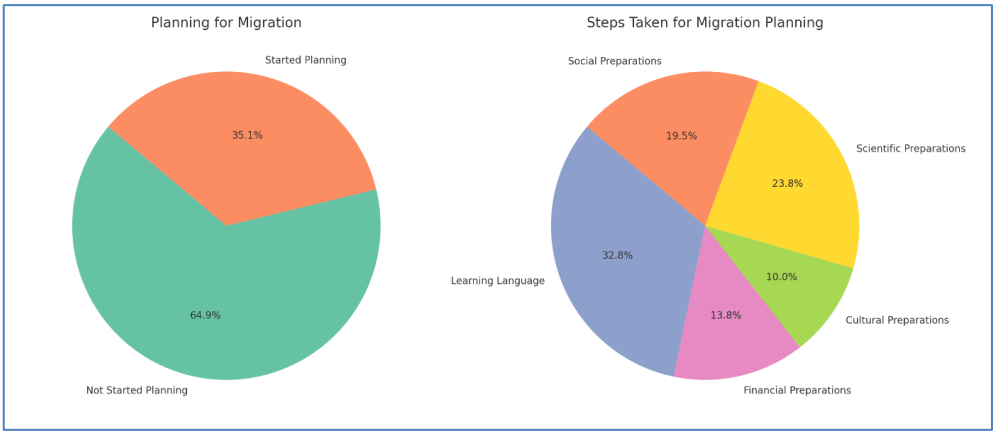

Fig. 3 Planning for migration

Table (3): Distribution of the surveyed students (n=650) according to planning for migration

	Alexandria University (n=392)		Horus University (n=258)		Total (N=650)		Test of significance
Starting planning to emigrate	N	%	N	%	N	%	
Yes	135	34.4	93	36.0	228	35.1	X^2=0.177 p=0.674
No	257	65.6	165	64.0	422	64.9	
If yes: Planning steps that have been taken to emigrate							
Learning the language of the destination country	144	36.7	69	26.7	213	32.8	X^2=28.230 p<0.001*
Financial preparations (saving money, working while studying, etc.)	46	11.7	44	17.1	90	13.8	
Cultural preparations (reading about the destination country culture and traditions)	50	12.8	15	5.8	65	10.0	
Scientific preparations (studying for the USMLE, PLAB or other relicensing exams)	72	18.4	83	32.2	155	23.8	
Social preparations (networking with colleagues who have already emigrated to the destination country)	80	20.4	47	18.2	127	19.5	

X^2: chi square test

p*: p-value is significant at level <0.05

3.Direction of migration

The majority of students surveyed in both universities (53.1%) have not yet decided on a destination country, indicating that many undergraduate students are still in the exploratory phase of planning their migration journey. The main reason given by students for not choosing a destination country is that it is 'too early to decide' (58.8%) (Figure 4). Other reasons include a lack of reliable information (15.5%) and a desire to travel regardless of the destination country (25.7%). In contrast, 46.9% have already made a decision, with the Arab Gulf countries being the most preferred destination (34.5%), followed by Europe (20.8%), the UK (15.2%) and the USA (12.3%). Smaller proportions of students plan to migrate to Australia/New Zealand (2.2%) or to other regions (8.2%). Notably, 6.9% of students stated that they had no intention of migrating. The majority of students rely on social media platforms (35.5%) to gather information about their intended destination, followed by official websites (26.6%). Friends and colleagues (21.1%) and family members (16.8%) also play an important role in providing advice and information Table (4).

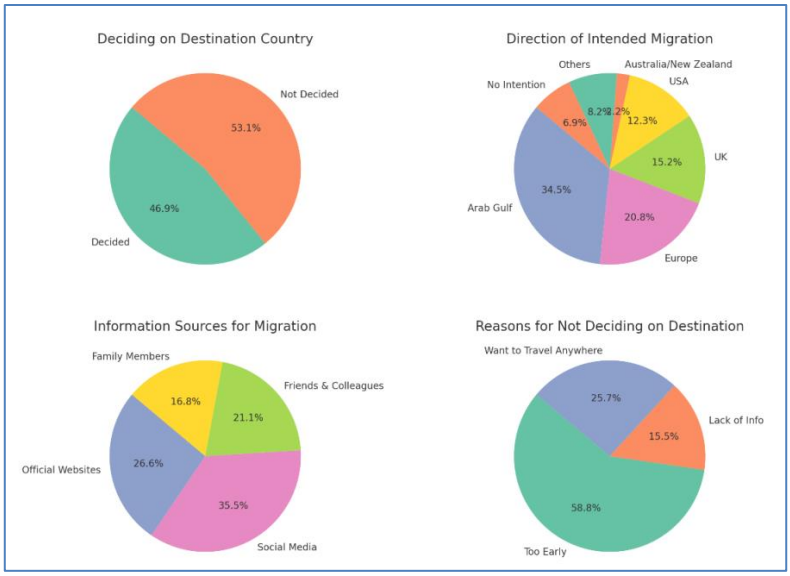

Fig. 4 Direction of migration

Table (4): Distribution of the surveyed students (n=650) according to intended direction of migration

	Alexandria University (n=392)		Horus University (n=258)		Total (N=650)		Test of significance
Determination of emigration destination country	N	%	N	%	N	%	
Yes	171	43.6	134	51.9	305	46.9	X^2=4.320
No	221	56.4	124	48.1	345	53.1	p=0.038*
Direction of intended emigration							
To the Arab Gulf countries	132	33.7	92	35.7	224	34.5	X^2=20.444
To Europe	69	17.6	66	25.6	135	20.8	p=0.002*
To the UK	77	19.6	22	8.5	99	15.2	
To the USA	45	11.5	35	13.6	80	12.3	
To Australia/ New Zeeland	11	2.8	3	1.2	14	2.2	
Others (Specify):	30	7.7	23	8.9	53	8.2	
Not applicable (I don't intend to emigrate)	28	7.1	17	6.6	45	6.9	
Sources of information about the intended destination country							
From searching official websites	83	21.2	90	34.9	173	26.6	X^2=26.284
From social medial platforms	155	39.5	76	29.5	231	35.5	p<0.001*
From friends and colleagues	98	25.0	39	15.1	137	21.1	
From family members	56	14.3	53	20.5	109	16.8	
Factors contributing to destination country indecision							
Because it's too early to decide	222	56.6	160	62.0	382	58.8	X^2=2.109
Because I don't have a reliable source of information	66	16.8	35	13.6	101	15.5	P=0.348
Because I want to travel regardless the destination country	104	26.5	63	24.4	167	25.7	

X^2: chi square test

p*: p-value is significant at level <0.05

4.Push/ Pull factors and facilitators and barriers of migration

Our sample shows that push factors were stronger than pull factors in shaping the migration intentions of undergraduate medical students, with 60.8% of students repelled by push factors compared to 39.2% attracted by pull factors. In terms of specific push and pull factors, financial factors stand out as the most significant, with 58.0% of students indicating financial instability as their primary motivation for migration. Professional factors, such as career opportunities, was cited by 29.1% of students, while socio-political factors, including instability and lack of security, influenced 12.9% of respondents (Figure 5).

Regarding the facilitators and barriers to migration a significant proportion of students (73.2%) cited the availability of a well-structured and attractive labour market in destination countries as a primary facilitator Table (5). Other notable facilitators include the ease of accreditation and re-accreditation processes for medical degrees in the destination countries (13.3%), as well as the presence of supportive social networks (3.5%) and social support systems (10.0%). The main barrier to migration in our sample is the difficult labour market situation in destination countries and the lack of job opportunities, cited by 43.5% of respondents. Other barriers included the lack of social networks and social support, cited by 31.8% and 12.2% of students respectively, and the lack of encouragement from friends and family, cited by 12.5% of students (Figure 6).

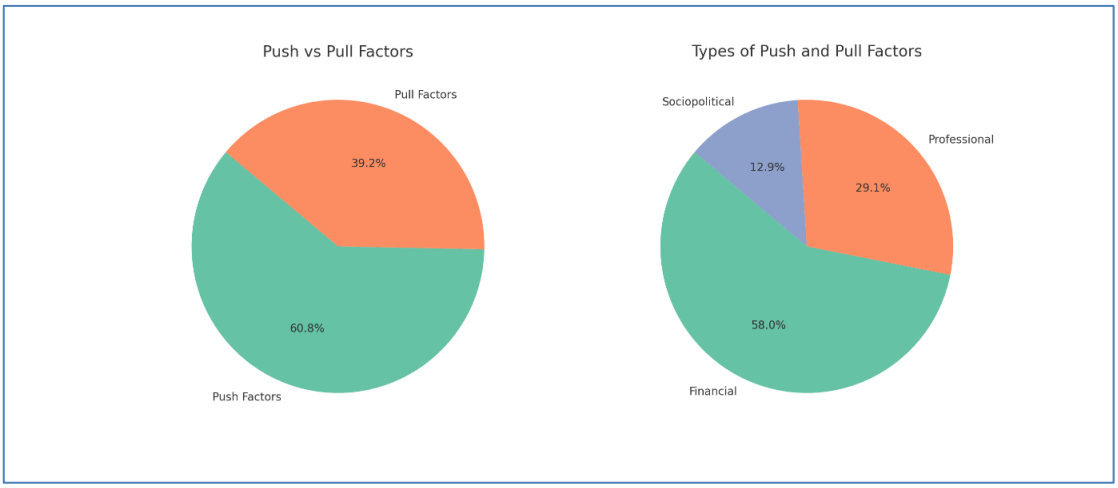

Fig. 5 Push and Pull factors

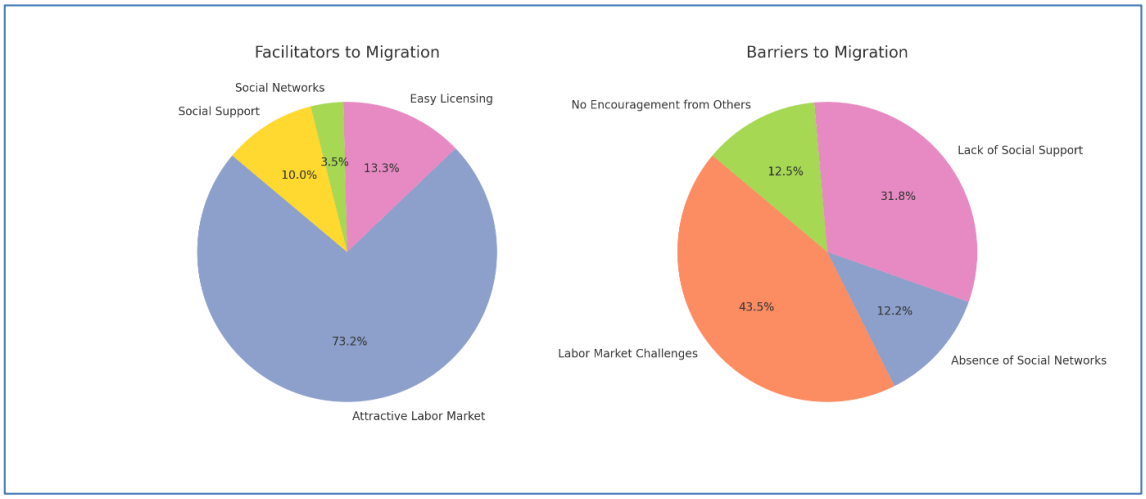

Fig. 6 Facilitators and Barriers

Table (5): Distribution of the surveyed students (n=650) according to motivation behind migration

	Alexandria University (n=392)		Horus University (n=258)		Total (N=650)		Test of significance
Most powerful driving factor behind emigration decision	N	%	N	%	N	%	
Factors repelling you away from the Egyptian health system (push factors)	283	72.2	112	43.4	395	60.8	X^2=54.070 p<0.001*
Factors attracting you towards the destination country abroad (pull factors)	109	27.8	109	56.6	255	39.2	
Main facilitator to emigration							
Attractive labor market situation and the abundance of job opportunities	260	66.3	160	62.0	420	64.6	X^2=5.446 p=0.245
Easy licensing and reaccreditation procedures for your medical degree certificate	39	9.9	37	14.3	76	11.7	
Social networks in the destination country (whether online or face to face)	10	2.6	10	3.9	20	3.1	
Social support that you get from the networks (aiding with job application process, emotional support, providing useful information)	32	8.2	25	9.7	57	8.8	
Encouragement from friends, colleagues or family that had already emigrated	51	13.0	26	10.1	77	11.8	
Main barrier to emigration							
Difficult labor market situation and absence of job opportunities	165	42.1	118	45.7	283	43.5	X^2=6.134 p=0.105
Difficult Absence of social networks in the destination country (whether online or face to face)	56	14.3	23	8.9	79	12.2	
Absence of social support that you get from the networks (aiding with job application process, emotional support, providing useful information)	128	32.7	79	30.6	207	31.8	
Absence of encouragement from friends, colleagues or family that had already emigrated	43	11.0	38	14.7	81	12.5	
Main driving factor behind decision to emigrate							
Financial driving factors	228	58.2	149	57.8	377	58.0	X^2=9.575 p=0.008*
Professional driving factors	102	26.0	87	33.7	189	29.1	
Sociopolitical driving factors	62	15.8	22	8.5	84	12.9	

X^2: chi square test

p*: p-value is significant at level <0.05

5.Culture of migration

The majority of students (68.6%) have relatives living abroad, which was proven to influence their migration intentions, as demonstrated by the chi-square test. A significantly higher proportion of students who intend to migrate have relatives living abroad compared to those who don't intend to migrate (p=0.017). In addition, 64.8% of students report having colleagues or friends living abroad. However, according to the chi-square test, there is no significant difference between students who intend to migrate and those who don't in terms of having colleagues or friends living abroad (p=0.168). Approximately half of the students (49.2%) have previous experience of travelling abroad, and a significant proportion of students (91.8%) rate their foreign language skills as good or above. The chi-square test also revealed a significant difference, with students intending to migrate rating their foreign language skills as excellent significantly more often compared to those not intending to migrate (p=0.020).(Table 6).

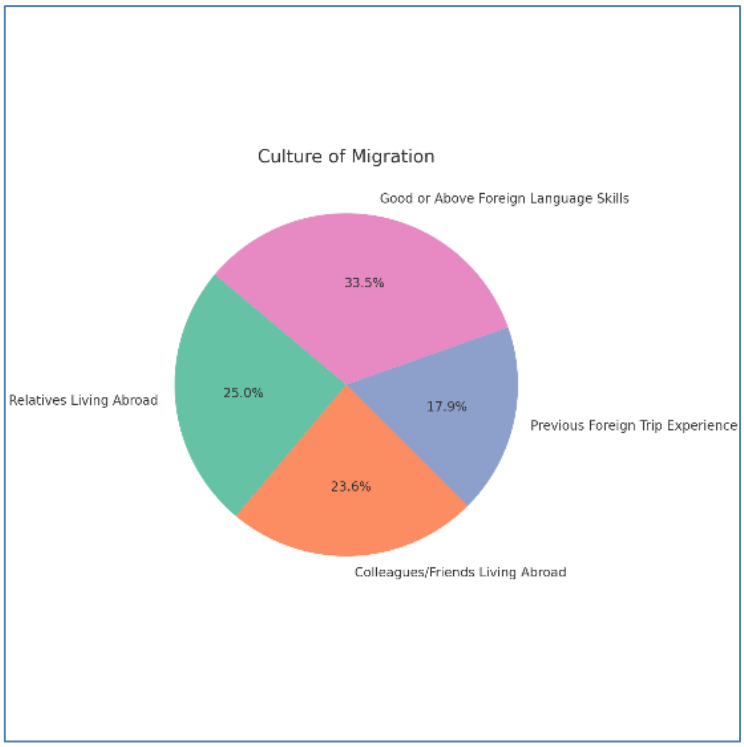

Fig. 7 Culture of Migration

Table (6): Distribution of the surveyed students (n=650) according to culture of emigration

	Alexandria University (n=392)		Horus University (n=258)		Total (N=650)		Test of significance
Presence of abroad-residing relative(s)	N	%	N	%	N	%	
Yes	258	65.8	188	72.9	446	68.6	X^2=3.593
No	134	34.2	70	27.1	204	31.4	p=0.058
Presence of abroad-residing colleagues/friends							
Yes	225	57.4	196	76.0	421	64.8	X^2=23.517
No	167	42.6	62	24.0	229	35.2	p<0.001*
Previous foreign trip experience							
Yes	128	32.7	192	74.4	320	49.2	X^2=108.590
No	264	67.3	66	25.6	330	50.8	p<0.001*
Self-Evaluation of Foreign Language Skills (e.g., English, French, German)							
Excellent	55	14.0	27	10.5	82	12.6	X^2=3.630
Very good	143	36.5	103	39.9	246	37.8	p=0.458
Good	158	40.3	111	43.0	269	41.4	
Fair	27	6.9	13	5.0	40	6.2	
Poor	9	2.3	4	1.6	13	2.0	

X^2: chi square test

p*: p-value is significant at level <0.05

B. Results of qualitative data

The analysis of the reasons why students in our sample have not yet started their migration preparation can be attributed to a variety of factors, mainly related to their current stage of study, financial constraints, lack of information and advice, and family responsibilities. The main themes identified are:

1.Timing and academic priorities:

1.1. Early stage of training: Many participants indicated that it was too early for them to consider emigration as they were still in the early years of their medical education. Comments such as 'because I am still in 2nd year (too early)' (Male student, Syrian, second year) and 'I am still a medical student' (Male student, Egyptian, fourth year) emphasise the focus on completing their studies first.

1.2. Focus on studies: A significant number of participants expressed a desire to focus on their current academic responsibilities before planning to emigrate. Examples include 'I am focusing on my current studies' (Male student, Egyptian, fourth year) and “I am waiting for graduation and then I will plan to immigrate” (Female student, Sudan, second year)

1.3. Preparation for exams: Some participants wait to prepare for and pass necessary exams such as the USMLE before making emigration plans, as seen in 'I haven't prepared for USMLE exam yet' (Female student, fifth year, Egyptian)

2.Financial constraints:

2.1. Financial difficulties are a prominent theme, with many respondents citing lack of money as a primary barrier. Comments such as 'I do not have the money to start' (Female student, Egyptian, fourth year) and “Don't have enough money” (Male student, Egyptian, fifth year) are common. The high costs associated with emigration, including preparation for necessary exams, and living expenses abroad, are also frequently mentioned. For example, “High cost of traveling tracks” (Male student, Egyptian, third year) and “It costs a lot of work and money, and I don't have either of them” (Female student, Egyptian, third year).

3.Lack of information and guidance:

3.1. Uncertainty about the process: Several respondents highlighted uncertainty and a lack of knowledge about the steps involved in emigrating, as evidenced by comments such as “I still don't know the exact steps to work abroad” (Male student, Egyptian, fourth year) and “Because I don't have a reliable source of information” (Female student, fifth year, Egyptian). Linking this theme to the responses about colleagues and relatives living abroad, it is clear that even participants with connections abroad find it difficult to obtain reliable information. This underlines the pervasive nature of the information gap and highlights that personal connections alone are not sufficient to adequately prepare individuals for the emigration process.

3.2. Need for guidance: The lack of adequate guidance and support is a notable concern among participants with and without connections abroad. Statements such as "I don't have any experience to start it and no one guides me” (Female student, Egyptian, Fourth year)

4.Family considerations:

4.1. Desire to stay with family: Many participants expressed a preference to stay close to their families, which influenced their decision to migrate. Some comments mention responsibilities to family members as a reason for not considering emigration currently, such as “Because, I live with my mother. I don't want to leave her alone.” (Male student, second year, Egyptian)

4.2. Gender and marital status considerations influence the emigration decisions of the female medical students in our sample. In particular, the dependence on the decisions of their future husbands and the uncertainty about their husbands' plans to travel abroad. These considerations add an additional layer of complexity to their decision-making process regarding emigration. Examples of quotes include “Waiting for my future husband” (Female student, third year, Egyptian) or “Waiting for my future husband to make a decision” (Female student, fifth year, Egyptian) or “Because I am a female and I am not sure about my husband if he is going to travel abroad or not” (Female student, fifth year, Egyptian).

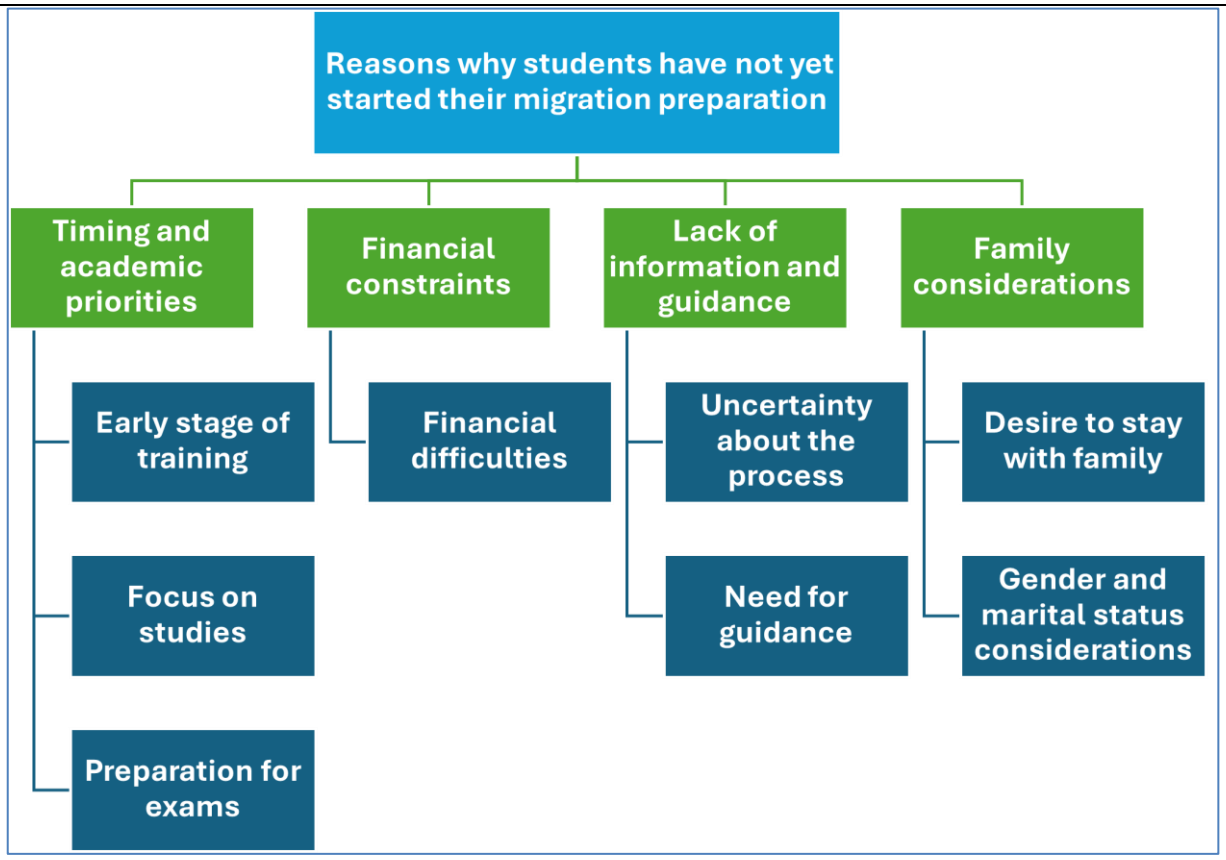

Fig. 8 Reasons why medical students have not started preparation for migration

The thematic analysis of students' feelings about migration reveals a complex interplay of emotions ranging from optimism and excitement to fear, sadness, and pragmatic acceptance. Migration is seen both as a necessary step towards better opportunities and as a challenging journey involving significant personal sacrifice and adjustment. These findings highlight the multifaceted nature of medical students' emotions about migration decisions. The main emotions identified are:

1.Optimism and Excitement: Several participants are optimistic and excited about the new opportunities and experiences that migration will bring: "Excited, to experience new places and opportunities" (Female student, fifth year, Egyptian). There is also a strong sense of hope and aspiration among participants for better educational, professional, and personal prospects abroad, e.g. "Always has been a dream" (Female student, fifth year, Egyptian). Other reasons for optimism and excitement included the potential for better financial rewards and a higher standard of living, professional development and educational opportunities, experiencing new cultures and environments, and personal growth.

2. Ambivalence and Mixed Feelings: Many participants expressed a combination of positive and negative emotions. They feel hopeful about opportunities but anxious about the challenges: "Excited yet worried" (Male student, fifth year, Egyptian), "Bitter as patience, sweet as honey" (Female student, second year, Egyptian).

3.Fear and Anxiety: The analysis showed mixed views among the study participants, while some had no anxiety at all, many were anxious about language and cultural adjustment, loneliness and potential racism, personal safety, maintaining religious practices, raising children with cultural values, and fear of failure: "Fear from new culture and being away from home and friends is hard" (Female student, fifth year, Egyptian) and " Loneliness, I will be alone, dependent on myself and fearing racism" (Male student, fifth year, Egyptian). Other reasons for anxiety included financial concerns (e.g. covering the costs of emigration and achieving financial stability), procedural hurdles (e.g. complicated visa procedures and fear of failing exams), finding suitable employment, ensuring recognition of qualifications and career stability.

4.Sadness and Loss: Some participants feel sad about having to leave their home country and the associated sacrifices: "I am upset that the only hope for getting a good income is to leave this country" (Female student, fourth year, Egyptian), "Sad because I am forced to travel" (Male student, fifth year, Egyptian).

5.Practical considerations: Some participants took a pragmatic approach, recognising the need for better financial and professional opportunities despite the hardships: "It provides opportunities but it's a sad thing that we are practically forced to emigrate" (Male student, third year, Egyptian).

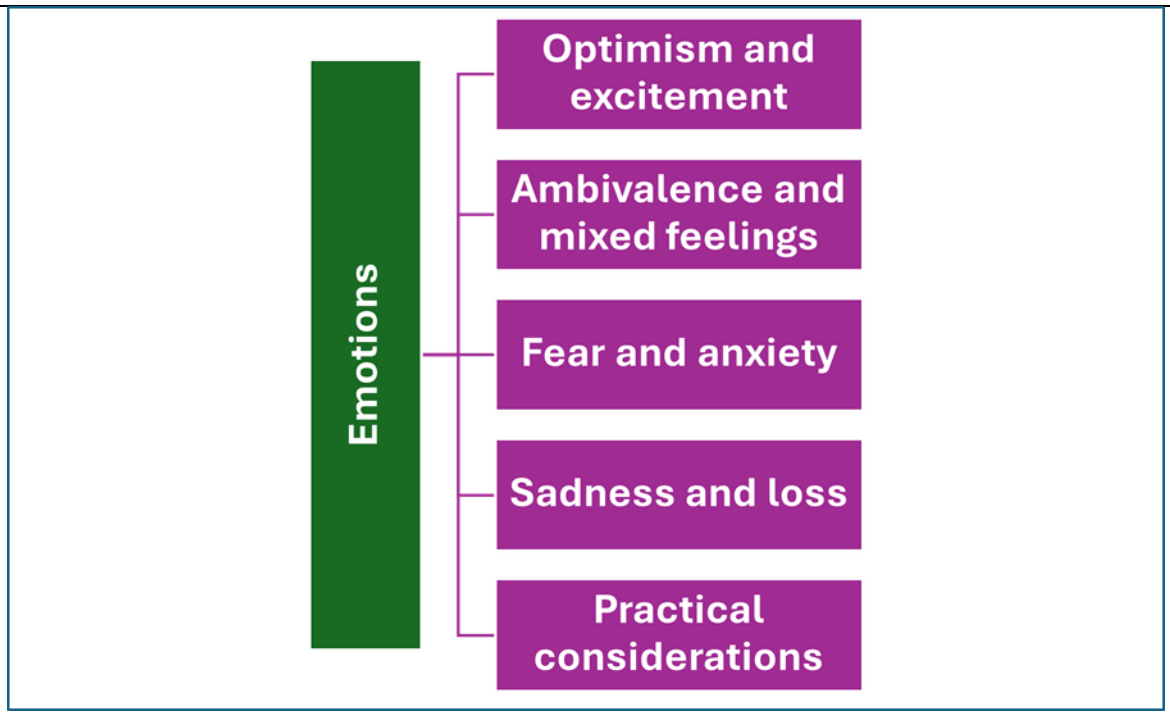

Fig. 9 Students' emotions related to migration

Discussion

The international migration of health workers, particularly physicians, has significant implications for the health systems of both countries of origin and destination. In Egypt, a lower middle-income country, the phenomenon has significantly contributed to the ongoing shortage of physicians, which presents challenges to the sustainability and capacity of the healthcare system. In order to facilitate more effective management of this challenge, the present study explored and offered insights on the migration intentions and plans of a sample of undergraduate medical students from two Egyptian universities. This section discusses the findings in relation to existing literature and presents recommendations informed by the results obtained from the current study.

More than two thirds (68%) of our students surveyed intend to emigrate after graduation and over a third (35%) have already started planning their migration, underlining the urgency of the issue. This result is aligned with international findings, reflecting a global trend among medical students to seek opportunities abroad. The literature shows significant global variation in migration intentions among medical professionals and students, strongly influenced by geographic and socioeconomic contexts. Upper-middle and high-income countries, such as Turkey, Serbia, and Ireland, show high levels of migration intention, with 71%, 81% and 88% of medical students surveyed, respectively, indicating plans to migrate (1, 22, 35). In lower-middle-income countries, the prevalence is particularly high, with rates reaching 94% in Ghana (25), 86% in Kyrgyzstan (23), 68% in Nigeria (21), and 60% in Pakistan (14). The Middle East has the highest prevalence, with Lebanon reporting 95.5%, reflecting unique regional pressures, instabilities and dynamics (26), while in Jordan the range was 63-85% intending to migrate for residency and fellowship opportunities respectively (24).

Our findings indicate that the prevalence of migration intentions among undergraduate medical students in Egypt (68%) is situated within the midrange globally, aligning with African countries like Nigeria (68%) and Middle Eastern countries like Turkey (71%). However, this prevalence is notably lower than those reported in a previous study conducted in Egypt, which may be attributed to potential differences in the timing, location, or context of the studies (3). This suggests that, while push factors are significant, they may not yet reach the levels observed in countries with the highest rates. The relatively high prevalence in Egypt, coupled with the significant proportion of students (35%) who have already begun preparations for migration - such as preparing for licensing exams and learn the language of their desired destination countries - mirrors trends observed in other settings, where medical students often begin migration-related preparations during their undergraduate years (14). This highlights the urgent need for targeted interventions to address these factors and ensure the retention of medical expertise. Our results show an almost even split among the participating students regarding the length of their intended stay abroad, with 51.5% considering an indefinite stay and 48.5% planning to return. This contrasts sharply with a previous study of Egyptian medical students, in which 81.8% of participants expressed a plan to return to Egypt after completing their training abroad (27). While 19% of participants expressed a preference for migration after graduation, 9% expressed a preference for migration even before graduation, suggesting

that physician migration and the associated "brain drain" may occur long before graduation from medical school (36).

The framework of push and pull factors was employed in this study as it is a widely recognised theoretical approach for investigating the migration intentions of medical students and physicians in the existing literature (1, 37, 38). This approach has been proven to be a valuable tool for understanding the complex interplay of economic, professional, and socio-cultural influences on migration decisions, thereby providing insights into both individual motivations and the systemic factors driving global medical migration. The push and pull factors that repel or attract medical students and professionals vary widely around the world.

With 60.8% of students repelled by push factors and 39.2% attracted by pull factors, the results of the current study show that push factors have a much stronger impact than pull factors in shaping the migration intentions of undergraduate medical students, which is consistent with previous studies in Egypt (4), the Middle East (24), Africa (38) Europe (39) and internationally (40). Our results show that financial push-pull factors - specifically financial (in)stability and (dis)satisfaction with the local healthcare system - motivate 60.8% of the participating students. Although these findings contrast with previous studies of Egyptian final-year students and physicians, which identified professional push and pull factors as the main motivators (4), they are consistent with trends observed not only in other low- and middle-income countries (LMICs) in Asia and Africa (38, 40, 41) but also in high-income countries (42, 43).

The preferred destination in our sample was the Arab Gulf countries, cited by 34.5% of respondents, which is consistent with previous research in Egypt and Sudan indicating that financial considerations are a primary driver of migration to the East, particularly to the Gulf countries like Saudi Arabia and the United Arab Emirates (4, 44). This can be attributed to the cultural and geographical proximity of the Gulf countries to Egypt and Sudan, which facilitates easier integration and familial connections. In contrast, financial push and pull factors in other source countries such as China and Ethiopia are driving migration to Western countries such as the USA and UK (17, 40, 45). This underscores the contextual nature of migration drivers and highlights the interplay of economic, cultural, and systemic factors in shaping destination preferences among medical students.

Professional push and pull factors were reported as the second most important driver of migration, cited by 29% of students as their main motivation for migrating which is consistent with research conducted among final year medical students in other settings in Africa (38), Asia (46) and Europe (39) where a significant proportion expressed an intention to migrate for better postgraduate or specialist training, career opportunities and professional aspirations. Sociopolitical push and pull factors, including instability and lack of security, influenced only 12.9% of respondents in our study, making them the least cited reasons for migration intentions among participants. This contrasts with findings from other countries in Africa, the Middle East and South and West Asia where socio-political factors play a more significant role in driving medical student migration. Terrorism, crime, violence, racism, political instability and insecurity were key factors in the migration intentions of medical students and physicians from countries such as Congo, Rwanda, Guinea, Nigeria and South Africa (47-49). In contrast, Egypt is perceived as a safe country with less exposure to the types of socio-political instability reported in these regions, which explains why socio-political factors were the least frequently cited as a reason for migration among Egyptian medical students. These findings suggest that while socio-political conditions are critical drivers of migration in many African and Middle Eastern contexts, other factors such as economic, professional or educational opportunities may be more important in shaping the migration intentions of health professionals in Egypt.

Beyond the push-pull factors, our results highlight the role of migrant culture in influencing medical students. Specifically, 68.6% reported having relatives abroad and 64.8% knew friends or colleagues who had emigrated. These social connections, coupled with exposure to international opportunities such as travel and language skills, further reinforce migration intentions. This finding is consistent with that of previous studies in Egypt, which suggest that the culture of migration plays an important role as a facilitator, because once migration has started in a particular direction, it is likely to encourage further migration in that direction through guidance on licensing exams, job placement and navigating new health care systems, thereby lowering the barriers to migration (4). This cultural context can shape students' perceptions of success and professional fulfilment, making the prospect of working abroad more attractive and socially validated (50, 51). The culture of migration is reinforced by the role of social networks, which act as information channels and sources of social, educational, psychological, informational and economic support, thereby influencing medical students' decisions to migrate (4, 50).

Qualitative results complemented the quantitative findings: Although social networks play a role, many students expressed uncertainty about the steps required to work abroad, suggesting a need for structured guidance. Open-ended responses revealed that 'push' factors overwhelmingly drive migration, with some feeling 'forced to emigrate'. In addition, female students noted that traditional gender roles and dependence on future husbands' decisions further complicate their migration decisions. These findings are consistent with other studies, not only in Middle Eastern cultures but also in European contexts, which have shown that career-related motives are influenced by personal relationships and societal expectations, particularly for female medical students (52).

A novel contribution of this study is its exploration of medical students' pre-migration emotions, providing a new perspective on the personal and emotional dimensions of migration

intentions. Our findings revealed a wide spectrum of emotions, ranging from fear, anxiety and sadness about the sacrifices and challenges associated with migration, to optimism and excitement about the opportunities for professional and personal growth. These emotions show that decisions to migrate are not purely professional or economic, but are deeply influenced by personal hopes, fears and family considerations. Complementing other studies that have explored the emotional challenges faced by medical students after migration - such as cultural adjustment difficulties, language barriers, reconciling religious practices, and coping with isolation and loneliness - our findings highlight that these challenges begin much earlier, while students are still in their home country (53). This broader emotional spectrum suggests that migration is not just a challenge of adjustment upon arrival, but a deeply emotional journey that begins in the home country. By shedding light on the pre-migration emotional landscape, our study provides a more comprehensive understanding of the migration process and highlights the importance of providing emotional and practical support at all stages of the migration journey.

This study of medical students' migration intentions is an important addition to the previous qualitative study on which the questionnaire was based (4), and also to population-level data, as it provides deeper insights into individual attitudes and behaviours of medical students in 2 different Egyptian universities and captures the motivations and perceptions that precede migration decisions, allowing the interplay between structural and personal factors to be explored. In addition, data on migration intentions are increasingly used in attempts to predict or forecast migration flows. Moreover, data on migration intentions are increasingly used to predict migration. There are some limitations to this study that should be acknowledged. First, the study was conducted among students from only two Egyptian universities, which may limit the generalisability of the findings to all medical students in Egypt. In addition, the cross-sectional design captures students' intentions and perspectives at a single point in time, which may not fully reflect the dynamic and evolving nature of migration decisions. Longitudinal studies would be needed to track how these intentions translate into actual migration over time. While the online questionnaire format allowed for a larger and more diverse sample, it may have excluded students with limited internet access or those less inclined to participate in online surveys, potentially introducing selection bias.

Recommendations

Drawing directly on our quantitative findings and qualitative insights, we propose a number of targeted strategies to address the challenges identified in this study. The data suggests that while many students express strong intentions to emigrate, a significant number remain in the early stages of planning due to academic priorities, financial constraints and a lack of clear guidance. At the **macro level**, policymakers should focus on systemic reforms that directly address the push factors highlighted in our findings. These include improving working conditions, enhancing career development opportunities and ensuring competitive remuneration within the Egyptian health system. Such reforms could help alleviate the financial and professional dissatisfaction that emerged in our survey as key drivers of migration.

At the **micro level**, educational institutions are encouraged to develop structured support mechanisms that align with the preparatory steps identified by students. This could include tailor-made careers advice that specifically addresses migration planning, the integration of language and exam preparation programs into the curriculum, and the creation of alumni mentoring networks. These initiatives would provide the practical guidance and support that many students reported as lacking, thereby promoting more informed and sustainable career decisions.

To ensure the development of a sufficient and skilled global health workforce, cooperation between countries of origin and destination will become increasingly important as medical education becomes more internationalised. The global distribution of health professionals should be balanced, push factors in countries of origin should be addressed, and support systems for students at every stage of their migration journey should be established. Mental health issues that begin long before students leave their home countries, as well as gender and cultural aspects of migration decisions, also need more attention. By incorporating these findings into global health workforce planning, stakeholders can promote sustainable solutions that not only reduce the negative impact of migration on countries of origin, such as Egypt, but also increase the global supply of health workers.

Conclusion

This study underscores the need for a coordinated approach that integrates both systemic reforms and individualized support to address the challenges related to medical workforce mobility. By addressing the specific barriers and needs revealed in our findings, stakeholders can work towards creating a balanced global distribution of health professionals while enhancing opportunities within Egypt. The interplay of personal, economic and social factors - including the influence of family ties and cultural considerations - emerges as central factors in shaping migration decisions. These findings suggest that while the attraction of global opportunities is strong, there is also a significant need for structured support and clear guidance to navigate the complexities of the migration process. By fostering robust local training environments and facilitating international collaborations, policymakers and educational institutions can work towards balancing the global distribution of health professionals while ensuring that the evolving needs of future health professionals are met.

Statements and declarations

Ethics approval and consent:

The study was conducted in accordance with the ethical standards of the Declaration of Helsinki and approved by the Ethics Committee of Alexandria Faculty of Medicine (serial number 0107790, IRB NO: 00012098, FWA NO: 00018699).

Availability of data and material:

Data supporting the current study are available from the corresponding author upon a reasonable request.

Conflict of interests:

The authors declare that they have no conflict of interests.

Funding:

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Authors contributions:

SR and MS conceived and designed the study and the questionnaire, SR conducted the validation of the questionnaire, MA, NB and SR contributed to data collection, SR contributed to the statistical analysis and interpretation, MS contributed to the analysis and interpretation of the open ended questions. All authors contributed to data interpretation. MS wrote the first draft of the manuscript. All authors contributed to revisions of manuscript. All authors read and approved the final manuscript. The authors state that they read and approved the final manuscript.

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References:

1.Eser E, Cil E, Sen Gundogan NE, Col M, Yildirim Ozturk EN, Thomas DT, et al. Push and Pull Factors of Why Medical Students Want to Leave Türkiye: A Countrywide Multicenter Study. Teaching and Learning in Medicine. 2023:1-13.

2.Organization WH. Global spending on health: a world in transition. World Health Organization; 2019. Report No.: 9240040374.

3.Kabbash I, El-Sallamy R, Zayed H, Alkhyate I, Omar A, Abdo S. The brain drain: why medical students and young physicians want to leave Egypt. Eastern Mediterranean Health Journal. 2021;27(11).

4.Schumann M, Maaz A, Peters H. Doctors on the move: a qualitative study on the driving factors in a group of Egyptian physicians migrating to Germany. Globalization and health. 2019;15(1):1-9.

5.Tam V, Edge JS, Hoffman SJ. Empirically evaluating the WHO global code of practice on the international recruitment of health personnel's impact on four high-income countries four years after adoption. Globalization and health. 2016;12:1-12.

6.Duvivier RJ, Burch VC, Boulet JR. A comparison of physician emigration from Africa to the United States of America between 2005 and 2015. Human resources for health. 2017;15:1-12.

7.WHO. Global Health Observatory data repository [Internet]. Geneva: World Health Organization [Available from: https://data.who.int/indicators/i/CCCEBB2/217795A.

8.ElBeheiry M. Determinants of Physicians' Brain Drain in Egypt [Master thesis]. AUC Knowledge Fountain: The American University in Cairo; 2024.

9.Abdelaziz A, Kassab SE, Abdelnasser A, Hosny S. Medical education in Egypt: historical background, current status, and challenges. Health Professions Education. 2018;4(4):236-44.

10. Docquier F. The emigration-development nexus: Recent advances from the growth theory perspective. Revue d'économie du développement. 2017;31(3):45-68.

11. Massey DS, Arango J, Hugo G, Kouaouci A, Pellegrino A, Taylor JE. Theories of international migration: A review and appraisal. Population and development review. 1993:431-66.

12. Arango J. Theories of international migration. International migration in the new millennium: Routledge; 2017. p. 25-45.

13. Hajian S, Khoshnevisan MH, Yazdani S, Jadidfard MP. Factors influencing the migration intention of dental and medical graduates in developing countries. European Journal of Public Health. 2019.

14. Sheikh A, Naqvi SHA, Sheikh K, Naqvi SHS, Bandukda MY. Physician migration at its roots: a study on the factors contributing towards a career choice abroad among students at a medical school in Pakistan. Globalization and health. 2012;8:1-11.

15. Holland J. Making vocational choices: A theory of vocational personalities and work environments.. Odessa, FL: Psychological Assessment Resources. Hutcheson, GD, and Sofroniou, N.(1999). The Multivariate Social Scientist: an introduction to generalized linear models. Vocational Guidance Quarterly. 1997;25(3):226-31.

16. Mcculloch E, Proctor DW, Mattick K. Medical Student Intentions to Move Abroad: A UK-Based Realist Evaluation. Perspectives on Medical Education. 2024;13(1):141.

17. Li W, Sun H. Migration intentions of Asian and African medical students educated in China: a cross-sectional study. Human Resources for Health. 2019;17:1-7.

18. Bartman I, Boulet JR, Qin S, Bowmer MI. Canadians studying medicine abroad and their journey to secure postgraduate training in Canada or the United States. Canadian medical education journal. 2020;11(3):e13.

19. Heffron M, Socha-Dietrich K. The Irish paradox: Doctor shortages despite high numbers of domestic and foreign medical graduates. Recent Trends in International Migration of Doctors, Nurses and Medical Students. 2019;67.

20. Jenkins R, Kydd R, Mullen P, Thomson K, Sculley J, Kuper S, et al. International migration of doctors, and its impact on availability of psychiatrists in low and middle income countries. PloS one. 2010;5(2):e9049.
21. Oghenekaro EG. Physician migration at its roots: Emigration intentions and preferences among medical students of a Nigerian University in the Niger delta region. Niger Delta Journal of Medical Sciences. 2019;2(2):7-18.
22. Santric-Milicevic MM, Terzic-Supic ZJ, Matejic BR, Vasic V, Ricketts III TC. First-and fifth-year medical students' intention for emigration and practice abroad: a case study of Serbia. Health Policy. 2014;118(2):173-83.
23. Kasiev N, Vishniakov D. MEDICAL STUDENTS'MIGRATION INTENTIONS: RISK FACTOR AND CHALLENGE FOR THE HEALTHCARE SYSTEM IN KYRGYZSTAN. PREVENTIVE HEALTHCARE: TOPICAL ISSUES OF HEALTH RISK ANALYSIS. 2024(1):128.
24. Omar Y, Al Refaei A, Al-Qawasmeh AR, Ghazzal H, Kalbouneh H. Migration intent among Jordanian medical students: a nationwide cross-sectional investigation. Postgraduate medical journal. 2023;99(1174):855-61.
25. Boakye MA, Maame-Boatemaa A-A. Determinants Of Intention To Emigrate Among Final Year Medical Students And Junior Doctors In Ghana: Determinants of Emigration Among Medical Students. Postgraduate Medical Journal of Ghana. 2023;12(2):86-91.
26. Akl EA, Maroun N, Major S, Afif C, Abdo A, Choucair J, et al. Post-graduation migration intentions of students of Lebanese medical schools: a survey study. BMC public health. 2008;8:1-8.
27. Fouad Y, Fahmy YM, Abdel Hady SM, Elsabagh AEM. Egyptian future physicians are packing to leave but may be willing to return. International health. 2015;7 3:190-4.
28. Oraby MI, Soliman RH, Mahmoud MA, Elfar E, Abd ElMonem NA. Migraine prevalence, clinical characteristics, and health care-seeking practice in a sample of medical students in Egypt. The Egyptian Journal of Neurology, Psychiatry and Neurosurgery. 2021;57:1-9.
29. Kabbash IA, El-sallamy RM, Zayed HAM, Alkhyate I, Omar AME, Abdo SA. The brain drain: why medical students and young physicians want to leave Egypt. Eastern Mediterranean health journal = La revue de sante de la Mediterranee orientale = al-Majallah al-sihhiyah li-sharq al-mutawassit. 2021;27 11:1102-8.
30. Schumann M, Baraka A. Using REFLECT rubric for assessing the reflective use of e-portfolios, a qualitative pilot study at Alexandria Faculty of Medicine. Journal of Health Professions Education and Innovation. 2024;1(2):21-35.
31. Lawshe C. A Quantitative Approach to Content Validity. Personnel psychology/Berrett-Koehler Publishers. 1975.
32. Srivastava A, Thomson SB. Framework Analysis: A Qualitative Methodology for Applied Policy Research. Comparative & Global Administrative Law eJournal. 2009.
33. Ritchie J, Spencer L. Qualitative data analysis for applied policy research. The qualitative researcher's companion. 2002;573(2002):305-29.
34. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative research in psychology. 2006;3(2):77-101.
35. Gouda P, Kitt K, Evans DS, Goggin D, McGrath D, Last J, et al. Ireland's medical brain drain: migration intentions of Irish medical students. Human resources for Health. 2015;13:1-9.
36. Hallock JA, Mckinley DW, Boulet JR. Migration of doctors for undergraduate medical education. Medical Teacher. 2007;29(2-3):98-105.
37. Martella M, Moro GL, Scaioli G, Grisafi-Schittone C, Gebbia G, Siliquini R, et al. Intentions to move abroad among medical students: a cross-sectional study to investigate determinants and opinions. Annali di igiene: medicina preventiva e di comunita. 2025;37(1):84-96.
38. Ojo TO, Oladejo BP, Afolabi BK, Osungbade AD, Anyanwu PC, Shaibu-Ekha I. Why move abroad? Factors influencing migration intentions of final year students of health-related disciplines in Nigeria. BMC Medical Education. 2023;23(1):742.
39. Bunduchi E, Vasile V, Stefan D, Comes C-A. Propensity for Migration of Healthcare Professionals: Push-Pull Factors Analysis. The Economic and Social Impact of the COVID-19 Pandemic: Romania in a European Context: Springer; 2024. p. 237-54.
40. Toyin-Thomas P, Ikhurionan P, Omoyibo EE, Iwegim C, Ukueku AO, Okpere J, et al. Drivers of health workers' migration, intention to migrate and non-migration from low/middle-income countries, 1970–2022: a systematic review. BMJ global health. 2023;8(5):e012338.
41. Silvestri DM, Blevins M, Afzal AR, Andrews B, Derbew M, Kaur S, et al. Medical and nursing students' intentions to work abroad or in rural areas: a cross-sectional survey in Asia and Africa. Bulletin of the World Health Organization. 2014;92:750-9.
42. Brennan N, Langdon N, Bryce M, Gale T, Knapton A, Burns L, et al. Drivers of international migration of doctors to and from the United Kingdom. 2021.
43. Lambert TW, Smith F, Goldacre MJ. Why doctors consider leaving UK medicine: qualitative analysis of comments from questionnaire surveys three years after graduation. Journal of the Royal Society of Medicine. 2018;111(1):18-30.
44. Mohamed EY, Balla S, Abdulaal A, Albary MA, Mukhtar AM. Postgraduation migration intentions of medical students in the faculty of medicine, university of khartoum. World J Pharm Pharm Sci. 2015;4:26-33.
45. Deressa W, Azazh A. Attitudes of undergraduate medical students of Addis Ababa University towards medical practice and migration, Ethiopia. BMC medical education. 2012;12:1-11.
46. Imran N, Azeem Z, Haider II, Amjad N, Bhatti MR. Brain drain: post graduation migration intentions and the influencing factors among medical graduates from Lahore, Pakistan. BMC research notes. 2011;4:1-5.

47. Poppe A, Jirovsky E, Blacklock C, Laxmikanth P, Moosa S, Maeseneer JD, et al. Why sub-Saharan African health workers migrate to European countries that do not actively recruit: a qualitative study post-migration. Global health action. 2014;7(1):24071.
48. Poudel C, Ramjan L, Everett B, Salamonson Y. Exploring migration intention of nursing students in Nepal: A mixed-methods study. Nurse Education in Practice. 2018;29:95-102.
49. Fletcher-Nkile L, Mrara B, Oladimeji O, editors. A Phenominological Qualitative Study of Factors Influencing the Migration of South African Anaesthetists. Healthcare; 2022: MDPI.
50. Blumenstock JE, Chi G, Tan X. Migration and the value of social networks. Review of Economic Studies. 2023:rdad113.
51. Awire EI. Social and structural factors affecting the culture of medical migration in Nigeria: insights from four public medical schools 2017.
52. Heiligers PJ. Gender differences in medical students' motives and career choice. BMC medical education. 2012;12:1-11.
53. Ali YA, Manzour AF, Mostafa NS, Hussein R. International Medical Students' Adaptation to University Life in Egypt: A Qualitative Study. Journal of High Institute of Public Health. 2023;53(3):105-13.