Nurses' Awareness about Brain Drain and Its Determinants Factors at Main Mansoura University Hospital

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ABSTRACT

Back ground: The brain drain and resettlement of health professionals for better opportunities, both within countries and beyond universal boundaries, is a cause of increasing concern due to its resulting effects on health systems in developing countries over many years. **Aim:** This study aimed to assess nurses' awareness about brain drain and its determinants factors at Main Mansoura university hospital. **Setting:** The study was conducted at Main Mansoura University Hospital. **Research design**: A descriptive correlational research design was used. **Subjects:** Convenience sample of nurses (195) was used. **Tools:** Two tools were used namely: Brain Drain Awareness Questionnaire and Brain Drain Determinants Factors Questionnaire. **Results:** The findings of the study revealed that nurses had good awareness about brain drain. The studied nurses had moderate perception of overall factors (push and pull) and there was a statistically significant strong positive correlation between overall brain drain determinants push and pull factors where and nurses' brain drain awareness. **Conclusion:** Both push and pull factors could independently contribute to a significant prediction of 65.2% and 66.7% of the nurses' brain drain awareness. **Recommendation:** Offering programs for professional growth and ongoing education, creating a supportive work environment and offering the necessary equipment and supplies.

Keywords: Awareness, Brain Drain, Determinants Factors & Nurses

Introduction

The impact of globalization and industrialization has caused the world's population to experience fast economic expansion in recent years. A respectable number of highly educated and competent professionals have left their native nations throughout the 20th century in quest of better job and social prospects elsewhere. The relocation of healthcare professionals in search of better prospects within and outside national borders is a growing source of concern because of the long-term consequences it will have on developing countries' health systems **(Okafor & Chimereze, 2020).** Professional's migration is referred to as "brain drain" **(Popogbe & Adeosun, 2022).**

Brain drain describes the global movement of resources, primarily nursing human capital, from developing to industrialized nations. The main component of this movement is the migration of people from developing to developed nations who are generally well educated and competent **(Chimenya & Qi, 2015).** The term "brain drain" describes the global exodus of healthcare professionals who are seeking better working conditions, more stable political contexts, access to cutting-edge technologies, and an overall better quality of life and standard of living **(Kadel & Bhandari, 2019).** Another term for brain drain is the loss resulting from a mass departure of professionals. Stated differently, "brain drain" refers to the net costs experienced by the exporting country, while "brain gain" refers to the net benefits of competent persons relocating to their new country **(Jeffers-Knight, 2015).**

As one of the most vital human resources in any country's healthcare system, nurses' performance plays a major role in determining the quality of care that patients receive. Every nurse has a propensity to relocate to an area with the best working conditions. Income is one of the key causes of brain drain, though not the main one. A move away from political upheaval, conflict, and the potential for violence in the workplace, as well as advancements in job satisfaction, career opportunities, and management and governance standards, are further considerations **(Baral & Sapkota, 2015).**

One of the main causes of the nursing shortage is the voluntary "brain drain" of nurses to industrialized nations, which may also contribute to financial loss, deterioration of the healthcare system, and delays in patient care. Additionally, this poses a serious risk to the accomplishment of sustainable development goals connected to health, endangering both the efficacy of global health interventions and the welfare of people that are already at risk **(Mokoena, 2017).**

The conditions that lead healthcare workers to migrate, their migratory patterns, and the degree to which push and pull variables impact their decisions are the key elements to watch in brain-drain; thus, push and pull factors are grouped together as the determinants of brain-drain **(Kabbash, et al., 2021).** The push-pull theory, which Lee expanded upon in 1966, is the most commonly cited theory to explain migration **(Najib, Abdullah, Narresh & Juni, 2019).**

Push factors are things that happen in the health workers' home (source) country that motivate them to leave their home or place of employment. These include inadequate pay, few educational opportunities, low job satisfaction, unstable political environments, and understaffing. Conversely, pull factors are the attributes of the destination nations that draw and make it easier for health workers to relocate there **(Sasso, et al., 2019).** Nurses and other skilled workers from developing nations are encouraged to migrate to industrialized nations due to higher earnings, greater career possibilities, and advancements in technology. The pull elements are autonomy,

favorable working conditions, professional progression opportunities, and employment availability **(Ajayi, Ajayi & Ogunleye, 2022).**

The problems surrounding the international movement of nurses, typically from unstable or impoverished nations to more stable or wealthy ones, have a significant impact on how health systems may be set up and, ultimately, how well patients are cared for **(Peters, Palomo & Pittet, 2020).** Both the nursing profession and the healthcare industry are in dire need of reform. As a large number of nurses are leaving the country in search of better work opportunities, which has a detrimental effect on the population's health and the standard of care **(Pretorius, 2018).**

Significance

Worldwide, there is a need for qualified health workers. However, individuals from less developed places are drawn to developed countries due to their access to modern technology, greater pay, and better living standards. Migration from developing to developed nations makes up the bulk of migration. This is causing increasing worry globally due to its effects on the health systems in developing countries **(Bortolazzi, & Khan, 2023).** Similarly, studies conducted in Egypt have shown that there is a chronic shortage of healthcare workers, particularly qualified nurses, in the country's health sector **(Hashish & Ashour, 2020).**

The reduction of nurses' manpower in the source country has a negative consequence affecting not only the health managers but also nurses on the ground level point of care, and patients who need the nursing services that only skilled nurses can deliver. Also, nursing staff remaining in the source country are left with a heavier workload, leading to chronic job dissatisfaction، demoralization and burnout. Hence, there is a significant need to examine, understand and identify how to mitigate all factors that may contribute to potential or actual migration of nurses. So this study aimed to assess nurses' awareness about brain drain and its determinants factors at Main Mansoura university hospital.

Aim of the study:

This study aimed to assess nurses' awareness about brain drain and its determinants factors at Main Mansoura university hospital.

Research questions:

1. What are the levels of nurses' awareness about brain drain at Main Mansoura University Hospital?

2. What are brain drain determinants factors as perceived by nurses at Main Mansoura University Hospital?

3. What is the relation between nurses' awareness about brain drain and determinants factors?

Methods

Design:

The survey design used in the study was a descriptive correlational.

Setting:

The study was conducted at Main Mansoura University Hospital that provides a wide spectrum of health service at Delta Region. Main Mansoura University Hospital building consists of five floors; the first floor contains five units (general medicine, orthopedic, medicine and dialysis, medical neuro surgery and anesthetic care unit). The second floor contains four units, operating room for general surgery and laboratory investigation. The third floor contains two units for obstetric and gynecological departments, two units for surgery and operating rooms for labor and anti-natal care units. The fourth floor contains two units for orthopedic surgery and two medical units. Finally, the fifth floor contains (ear, nose and throat) surgery.

Participants:

Convenience sample was used of 195 nurses that were available during the time of data collection with inclusion criteria that they have at least one year of experience and willing to participate in the study at Main Mansoura University Hospital. Total number of nurses was 320 nurses.

Tools of data collection:

Two tools were used for data collection in the present study namely: Brain Drain Awareness Questionnaire and Brain Drain Determinants Factors Questionnaire.

Tool (I): Brain Drain Awareness Questionnaire:

This tool aimed to assess nurses' awareness about brain drain. It consisted of two parts:

The first part: It used to identify personal characteristics of the study nurses such as, age, gender, nursing educational qualifications, nursing position, and years of experience.

The second part: It was designed by the researchers based on a comprehensive literature review **(Okafor & Chimereze, 2020; Dohlman, DiMeglio, Hajj & Laudanski, 2019; Çetin & Savaş, 2023).** It aimed to assess nurses' awareness about brain drain. It consisted of 31 items divided into five domains : brain drain concept (2 items) ,causes of brain drain (6 items), benefits of brain drain (5 items) , consequences of brain drain (7 items), brain drain mitigating solutions (11 items).

Responses on dimensions measured using a three-points Likert scale as the following: 1=disagree, 2=uncertain, 3=agree.

Scoring system:

Based on cut of point:

-Poor awareness (<50% of the total score)

- Fair awareness (50-75% of the total score)

-Good awareness (>75% of the total score)

Tool (II): Brain Drain Determinants Factors Questionnaire: A self-administered questionnaire was developed by the researchers after an extensive literature review **(Atte, 2021 & Öncü et al., 2021).** It aimed to identify determinants

factors of brain drain among nurses. It consisted of two main dimensions:

The first dimension: Push factors

It consisted of 34 items to measure reasons that could 'push' nurses to emigrate from their home country. It addressed six main factors: personal (8 items), economic (8 items), political (4 items), nurse image factors (3 items), skill and career development (3 items), and work-related factors (8 items).

The second dimension: Pull factors

It consisted of 23 items to measure factors in other countries (host country) that could 'pull' nurses to migrate. It addressed five main factors: economic factors (7 items), skill and career development (3 items), political factors (3 items), work related factors (8 items), and nurse image factors (2 items).

Responses on first and second dimensions measured using a five- points Likert scale as the following: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.

Value of means for the response on a five-point Likert scale: <2.5 = low mean, 2.5–3.75 = moderate mean, >3.75 = high mean (Hashish& Ashour, 2020).

Validity and Reliability

Study tools were tested for its face validity by five experts including three professors of nursing administration and two assistant professors of

nursing administration all affiliated to faculty of nursing, Mansoura University in the field of the study. The validity of the tools intended to judge its simplicity, accuracy, clarity comprehensiveness as well as accepted by jury committee.

Pilot study

It was done on 10% of the study participants (20 nurses) to ascertain the clarity, feasibility, relevance, comprehensiveness, applicability of the developed tools and to estimate the time needed to fill the questionnaire sheet, and they were randomly selected and excluded from the study sample and results of the study. Then there were no modifications on tools. Cronbach's alpha was applied to assess the internal consistency of the study tools, which needed to be at least 0.5 and preferably over 0.7 using test- retest. Cronbach Alpha test was calculated for brain drain awareness questionnaire (α =0.868), and brain drain determinants factors questionnaire (α =0.930) which refers to be reliable.

Field work

Gathering data from nurses by outlining the purpose of the study to each nurse and obtaining their consent, the questionnaire took 20 to 25

minutes to complete. The data gathered took a month to be completed.

Statistical analysis

Version 22 of the statistical software for social science (SPSS) was used to examine the data. Using the one-sample Kolmogorov-Smirnov test, the data's normality was initially assessed. The following descriptive appropriate statistical tests were used: mean, standard deviation, frequency, and percentage. In addition to inferential statistics, the Student t test and the Analysis of Variance (ANOVA) test were employed to compare the means of the two groups and any additional groups. The study variables were analyzed using regression analysis to determine the relationships between them. The correlation between variables was tested using Pearson's correlation coefficient. For data visualization, Microsoft Excel was used to create graphs. In cases where the chance of mistake is less than 5% ($P < 0.05$), the results are deemed significant.

Ethical Consideration

The Mansoura University Faculty of Nursing's Research Ethical Committee granted ethical permission code number 0593. The hospital's responsible administrator granted formal approval to conduct the study. Every participant was made aware that their involvement in the study was entirely voluntary and that they might leave at any time. Every participant received an assurance regarding the privacy of the study sample and the confidentiality of the data acquired throughout the whole investigation.

Results

Table (1): Personal characteristics of the studied nurses at Main Mansoura university hospital. According to the table, a total studied nurse was 195. This table showed that less than half of nurses (46.2%) aged from 20-24 years. More than half of them (58.5%) were male. More than half of them (64.1%) had technical nursing degree. More than half of them (59.0%) were technical nurses. Concerning experience years, a percentage of (53.8%) have experience of (1-5) years while (25.6%) of them have (5-10) years.

Table (2): Nurses' awareness about brain drain at Main Mansoura university hospital. This table revealed that the brain drain awareness sub items were compared and significantly different to mean scores. As ensure brain drain mitigating solutions was found the highest (mean =29.23±3.94). Whereas concept of brain drain was the lowest (mean=5.26±1.08).

Figure (1): Nurses' awareness about brain drain at Main Mansoura University Hospital. This figure revealed that majority of nurses had good awareness about brain drain.

Table (3): Determinants factors of brain drain among the studied nurses at Main Mansoura University Hospital. According to this table, the studied nurses revealed moderate perception of overall factors (push and pull) with mean and SD (3.42±0.42). The overall mean and SD of push factor was moderate (3.51±0.56). As regard push factors, personal factors were the highest (mean =3.62±0.75) whereas political factor was the

lowest (mean =3.24±0.77). The overall mean and SD of pull factors was moderate (3.61±0.77). Concerning pull factors, work related factor was the highest (mean =3.84±0.84) whereas economic factor was the lowest (mean =3.25±1.05).

Table (4): The relationship between studied nurses' personal characteristics and their awareness about brain drain at Main Mansoura University Hospital. The table showed that there was a significant relation between awareness about brain drain and all personal characteristics. The highest awareness about brain drain was reported by the studied sample aged from 25-35 years, male (83.45±7.34), graduated from school nursing (82.6±5.11) and who had 1-5 years of experience.

Table (5): Correlation and multiple regression analysis between brain drain determinants push-pull factors and brain drain awareness among the studied nurses. This table reflects a statistically significant strong positive correlation between overall push and pull factors where (r = 0.319, p < 0.001). In addition, the regression coefficient values between push factors as well as pull factors as independent variables and overall brain drain awareness as the dependent variable were $R^2 = 0.652$ and $R^2 = 0.667$, respectively. Indicates a statistically significant correlation and this meant that both push and pull factors could independently contribute to a significant prediction of 65.2% and 66.7% of the nurses' brain drain, respectively, where the regression model and correlation is significant (F = 362.129, p < 0.001; F = 386.688, p < 0.001)

Table 1: Personal characteristics of the studied nurses at Main Mansoura University Hospital (n=195)

Variables	No.	%
Age in Years		
20: 24 years	90	46.2
25:35 years	85	43.6
>35 years	20	10.2
Mean ± SD	*28.31±4.57*	
Gender		
Male	114	58.5
Female	81	41.5
Level of nursing education		
School nursing	25	12.8
Technical institute of	125	64.1
Bachelor degree	45	23.1
Nursing Position		
Technical	115	59.0
Professional	65	33.3
Head nurses first	15	7.7
Years of experience		
1-5 year	105	53.8
5-10 years	50	25.6
>10 years	40	20.5

Table 2: Nurses' awareness about brain drain at Main Mansoura University Hospital (n=195)

Domains	No. Item	Mean ± SD	Min-Max
Concept of brain drain	2	5.26±1.08	2-6
Causes of brain drain	6	14.97±2.75	7-18
Benefits of brain drain	5	12.54±2.57	8-15
Consequences of brain drain	7	17.62±3.04	10-21
Brain drain mitigating solutions	11	29.23±3.94	20-33
Total score	*31*	*79.62±9.84*	*57-91*

Figure 1: Nurses' awareness about brain drain at Main Mansoura University Hospital (n=195)
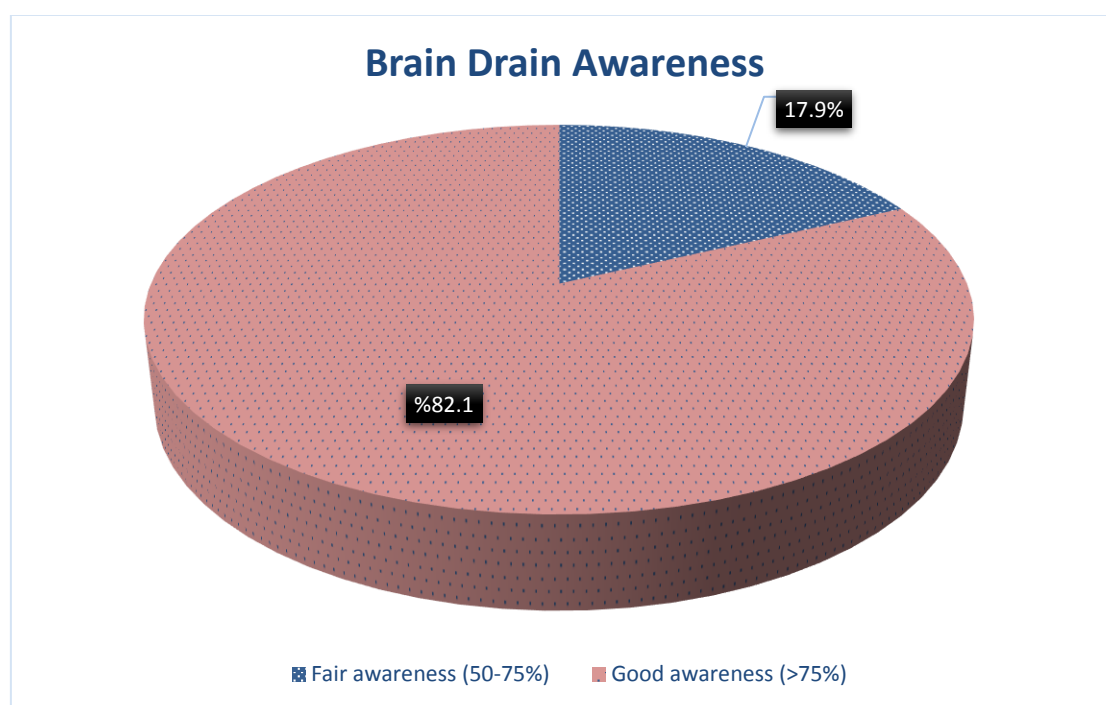
Brain Drain Awareness

17.9%

%82.1

☒ Fair awareness (50-75%)　　■ Good awareness (>75%)

Table 3: Determinants factors of brain drain among the studied nurses at Main Mansoura University Hospital (n=195)

Brain drain factors	Mean ± SD
Overall push factors	3.51±0.56
Personal factors	3.62±0.75
Economic factor	2.57±0.92
Political factor	3.24±0.77
Work related factor	3.28±0.95
Skill and career development factor	3.39±0.87
Nursing image factor	3.27±0.51
Overall Pull factors	3.61±0.77
Economic factor	3.25±1.05
Political factor	3.61±0.7
Work related factor	3.84±0.84
Skill and career development factor	3.51±1.05
Nursing image factor	3.56±0.52
Overall brain drain factors (push and pull)	3.42±0.42

Table 4: The relationship between studied nurses' personal characteristics and their awareness about brain drain at Main Mansoura University Hospital (n=195)

Variables	Total Awareness Mean ± SD	Test of significance
Age in Years		
20: 24 years	77.89±8.8	
25:35 years	82.29±9.5	F= 6.207
>35 years	76.00±12.88	(0.002)**
Gender		
Male	83.45±7.34	T= 7.265
Female	74.22±10.4	(<0.0001)**
Level of nursing education		
School nursing	82.6±5.11	F= 4.931
Technical nursing institute	80.36±9.18	(0.008)**
Bachelor degree	75.89±12.4	
Nursing Position		
Technical	82.48±6.84	T= 14.164
Professional	76.08±11.25	(<0.0001)**
Head nurses first level	73.00±14.44	
Years of experience		
1-5 year	81.23±12.11	T= 3.955
5-10 years	80.57±6.68	(0.021)*
>10 years	76.32±12.5	

Table 5: Correlation and multiple regression analysis between brain drain determinants push-pull factors and brain drain awareness among the studied nurses (n=195)

Factors	Brain drain awareness			
	r	R^2	F	P
Pull factors	0.319	0.652	362.129	<0.001**
Push factors	(p<0.001)**	0.667	386.688	<0.001**

r: Pearson coefficient; R^2: coefficient of determination; *F*: analysis of variance.

*Statistically significant at $p \leq 0.05$.

Discussion:

Nursing shortages around the world have led to unprecedented rates of international and interregional nurse migration **(Drennan & Ross, 2019).** The loss of trained nurses from areas where health systems are already stressed to their limits leaves the remaining professional nurses overwhelmed and demoralized and can result in a critical lack of services **(Aluttis, Bishaw & Frank, 2014).** The decision to emigrate is the result of interplay of many factors. Economic, cultural, social, political and legal forces are some of these factors **(Crisp& Chen, 2014).** This study aimed to assess nurses' awareness about brain drain and its determinants factors at Main Mansoura university hospital.

The present study revealed that nurses had good awareness about brain drain. Also, the study revealed that nurses' awareness about brain drain mitigating solutions was the highest whereas nurses' awareness about concept of brain drain was the lowest. This may be due to nurses believed that these solutions can decrease the chance of migration and improve the working conditions. On the same line, **Thapa & Shrestha, (2017)** found that most of the nurses' perceived needs of

controlling brain drain through mitigation solutions. Also, majority reported that providing better employment opportunity would be an effective solution to control migration.

In addition, **Abou Hashish, Abdel All & Mousa, (2018) and Abou Hashish, (2017)** highlighted that hospitals and nurse managers need to create and sustain a supportive work environment, where an ethical work environment and leadership styles are important factors in promoting work engagement and job safety, recognition for nurses' work as well increases job satisfaction and engagement.

The current study revealed moderate nurses' perception of overall factors (push and pull). Also, the study revealed moderate perception of nurses regarding the overall mean of push factor. Regarding to the sub-factors, the highest mean score was for personal factors followed by economic and skill and career development factor respectively whereas political factor was the lowest. Also, the study revealed moderate perception of nurses regarding the overall mean of pull factor. Concerning the sub-factors, the present

study found that work related factor was the highest whereas economic factor was the lowest.

This may be due to numerous nurses want to migrate for professional experience and others are disappointed as a result of their life conditions. Availability of work environment resources and technologies in developed countries, meeting their personal goals and interest to travel to work away and gaining international experience are some of the major causes for migration according to nurses. On the same line, **Thapa & Shrestha, (2017**) reported that many of nurses had ranked personal factors as the most important push factor. Also, training and latest technologies, facilities and communication systems, better working environment, job satisfaction, better work lifestyle and more opportunities for success, career opportunities and are important reasons for migration.

The economic factor is seen as the primary reason for Egyptian nurses to migrate. Poor salaries and remuneration have a negative impact on the social and work life of nurses. Insufficient financial resources to afford their family and social responsibilities are important factors to consider

when making a migration decision. On the same line as these results are the findings of An African study conducted by **Pretorius, (2018)** who reported economic reasons as the main push factors, especially low salary for nurses which do not match their obligations.

Also, **Kadel & Bhandari, (2019)** revealed that the majority of Nepali respondents were not satisfied with their salary in Asian countries and considered financial reasons as a push and pull factor. Additionally, Filipino nurses considered low salary, within both the public and private sectors as the main push factor **(Dimaya et al., 2012).** According to **Deasy et al., (2021)** pay and working conditions influence intentions to migrate. Moreover, **Iqbal et al., (2021)** considered high wages outside China and low wages within China are one of the top reasons to migrate.

The political factor was the lowest factor regarding push factors. This may be due to the political scene is improved now in the Egyptian context, although the instability in the political situation and the security in the country could affect the healthcare system and push nurses to migrate because they think it will be better

elsewhere. In contrast, **Cristian & Baragan, (2015); Fong &Hassan, (2017)** found that political corruption/legislative instability was the strongest determinant of the respondents' migration. Also, **Sapkota, van Teijlingen & Simkhada, (2014)** revealed that Nepalese nurses were worried about the political situation, related unrest and security issues, which made them vulnerable in the workplace, specifically nurses.

The work related factor was the highest factor regarding pull factor. This may be due to the work environment and its related conditions are a big challenge and source of job dissatisfaction for Egyptian nurses when nurses experienced stress at work. They felt powerless and frustrated when they couldn't care for patients in a proper way because their hospital was understaffed with inadequate resources and insufficient technology and training. All of these reasons can lead them to migrate to another country with enhanced work environment.

On the same line, **Hashish & Ashour, (2020)** reported that economic and work environment reasons were reported as the most influential for nurses' brain drain (migration). Similarly, **Poudel**

et al., (2018) identified unemployment, poor working conditions, low salaries, insufficient postgraduate education, and a lack of professional autonomy in Nepal as reasons for their intention to migrate. Additionally, **Sapkota, van Teijlingen & Simkhada, (2014)** discovered that the majority of interviewees cited job pressure and an unwarranted nurse-to-patient ratio as significant factors in nurses' departure patterns, which in turn had a compounding influence on nursing turnover. Moreover, inadequate working conditions, outdated medical technology, and a lack of opportunity were cited by **Dimaya et al., (2012)** as major factors in nurses' migration.

The current study revealed a statistically significant positive correlation between overall push and pull factors. The regression models between push factors as well as pull factors as the independent variable and overall brain drain awareness as the dependent variable were statistically significant. Similarly, push and pull factors can predict approximately 99.6% and 97.5% of the nursing brain drain, respectively, according to **Hashish & Ashour (2020)**. However, **Poudel et al. (2018)** revealed that happiness with the clinical learning environment and

belongingness were important predictors of professional identity. Thus, through their impact on professional identity, belongingness and happiness with the clinical learning environment indirectly predicted awareness of the brain drain and intention to migrate.

The study result showed that there was a significant relation between awareness about brain drain and all personal characteristics. On the same line, **DywilI, Bonner & O'brien, (2013)** reported that age was highly correlated with their awareness about brain drain as well intent to migrate. On contrary, **Lee, (2016)** reported that subjects' ages and gender were not significant statistically associated with their awareness about brain drain and intent to migrate. As well, **Li & Sun, (2019)** indicated that subjects' gender was not significantly associated with their awareness about brain drain and intent to migrate.

Conclusion

The present study concluded that nurses had good awareness about brain drain. As well, nurses had moderate level perception of overall brain drain determinant factors (push and pull). Regarding push factors, the highest mean score

was for personal factors followed by economic and skill and career development respectively whereas political factor was the lowest. Concerning pull factors, work related factor was the highest whereas economic factor was the lowest. Moreover, there was statistically significant positive correlation between overall brain drain determinant push and pull factors, and brain drain awareness. Additionally, there was a significant relation between awareness about brain drain and all personal characteristics.

Recommendation

Based on the findings of this study, the following can be recommended: -

For policy makers:

Taking into account the main push and pull reasons that nurses have identified, supporting and strengthening the nursing sector to improve working conditions and designing retention strategies by:

-Offering programs for professional growth and ongoing education.

- Creating a supportive work environment and offering the necessary equipment and supplies.

- Professional marketing of the nursing field to enhance the reputation of nursing profession.

-Enhancing the financial status of nurses by increasing pay and benefits to a level that guarantees better living standards.

Further research:

-Duplicate this study in more than one hospital in different regions of Egypt using larger samples size for more understanding of causes of nursing migration in Egypt as well as the mitigating solutions.

-Research's exploring practices supporting emplacing good environment conditions, assimilation and creativity in the workplace.

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