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The power of push factors on academic's brain drain in higher education system in Sudan

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Abstract. This study aimed to investigate the level of push factors of brain drain among the academics in the Sudanese higher education system. The status of a university environment, lack of research policy, and intellectual freedom led Sudanese higher education institutions to lose a growing number of highly qualified professors. The study aspires to identify the power of work environment, career development, livelihood, and political factors in higher education and to what extent do these antecedents predict brain drain. The study used a convergent mixed research approach. To that end, 380 participants were taken through simple random sampling techniques. Quantitative data was collected from teachers using closed-ended questions. At the same time, vice-chancellors, faculty deans, and department heads were interviewed. Quantitative data was analyzed through mean scores, one-sample t-test, and linear regression analysis and ANOVA, respectively. Qualitative data was analyzed through thematic narration. The study found that addressing push factors by improving the work environment to meet employers' expectations, going through career development barriers, stabilizing the political environment, restructuring wages and remunerations could control the brain drain. It is also found that improved governance creates an ideal academic environment by maintaining relevant legislation, supplying funds for activities, and pursuing training and capacity-building initiatives to prevent brain drain. The study recommended that leaders and stakeholders enforce proper strategies and policies for environmental improvement and encourage private sector investment in higher education. Also, policymakers and funding agencies should pass legislation to fill the wage gap, which absorbs migration.

Keywords. Brain drain, Career Development, Migration, Push Factors, Pull factors

Introduction

Background of the study

Developing countries invest in higher education to achieve economic growth and sustainable development. This cannot occur without sound human capital, with education being a key component in this regard. To this end, education and training are expected to produce a more responsive intellectual human capital that can thrive in a constantly changing work environment (Pelinescu, 2015). Hence, besides the key roles, it plays in determining economic growth, human capital is associated with a wide range of noneconomic benefits such as better health and wellbeing (Post, Clipper, Enkhbaatar, Manning, Riley,&Zaman, 2004). However, the accumulation of human capital alone does not render the required benefit for an organization or a country.

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Regarding this African universities currently function in very difficult circumstances and face challenges such as brain drain threatening the future of academic development since higher education is a key force for modernization and development (Teferra, &Altbachl, 2004). Studies show that Africa is suffering from brain drain by losing one-third of its professionals in the developed world (UNDP, 2006). They migrate overseas because they anticipate better work and life opportunities (Capuano,&Marfouk, 2013)

Brain drain is a phenomenon whereby countries suffer an outflow of their highly educated elite on a scale threatening national development needs (Jałowiecki & Gorzelak, 2004). Recently the concept of brain drain designates the international transfer of resources in the form of human capital, i.e., the migration of relatively highly educated individuals from developing to developed countries (Beine, Docquier &Rapoport, 2001). Various terms conceptually refer to brain drain in the literature. Academically this term is also identified as the human capital flight, is the large scale migration of highly educated, skilled, and talented people of less economically advanced countries to prosperous and developed countries of the world due to conflicting issues, political instability, and lack of opportunities in the developing countries (Borta, 2007). In this respect, it is categorized into external and internal brain drain. The external brain drain is conceptualized as the intention to remain abroad, given that they would have opportunities for further study or research. In contrast, internal brain drain refers to the circulation within the country, which means the mobility of academics from one university to another university or organization internally seeking better career opportunities and offers (Semela, 2011).

To understand the impact of skilled labour migration or brain drain from developing countries, it is important first to understand the factors driving it. These factors are categorized into push and pull factors (Roudgar & Richards, 2015; Muthanna & Sang, 2018). The push factors are particular local contexts in developing countries. The pull factors are attractions of rich or developed countries that receive skilled from the other migrants (Nunn & Price, 2005).In this respect, both factors will be viewed in terms of work environment, career development, livelihood, and political factors. The work and educational environment concerning the teaching. Some monetary affairs regarding funding research and publishing in higher education and career development opportunities (Sawahel, 2016). These causes have many consequences and create an environment that makes academics stay or leave Sudan, causing problems to the Sudanese universities (Saeed, 2017).

Different scholars conduct several types of research to inform the causes of brain drain in higher education concerning push factors. The findings by Saeed (2017) revealed that salary inadequacy and increasing cost of living, and poor work environment are major push factors and reasons for migration. Among the Push factors is the lack of necessary equipment or facilities to perform research and research funding (Sawahel, 2016, Roudgar & Richards, 2015, Odhiambo, 2012). Another study conducted by AlTeraifi and Hamid (2018) found that the major causes of migration are economic, political, academic, and cultural reasons, besides job satisfaction, educational and work environment, and publishing in higher education (Sawahel, 2016; Teferra, 1992). These causes directly impact academia and quality of education for institutions where many professors migrate to take up work in other countries (Saeed, 2017, Muthanna & Sang, 2018). A study conducted by Abu Obeida(2015) stated that higher education academic institutions in Sudan suffer from a high migration rate among the qualified, skilled staff due to economic factors. A similar study by Akusoba revealed that push factors such as poor salaries, poor work conditions, and poor leadership are the major factors that force teachers and workers to migrate, searching for better opportunities to fulfill their needs. This denotes that push factors reflect local or home dissatisfactions, whereas pull factors reflect the attraction

to the opportunities and conditions elsewhere (Roudgar & Richards, 2015).To this end, understanding the factors affecting skilled migration is necessary to facilitate appropriate human resource management policies (Marfouk, 2008).

One of the main push factors for brain drain is the political factors. The main political reasons that highly educated people leave their country of origin are political strife and political oppression, reflecting political instability. Political instability is identified as situations, activities, or patterns of political behavior that threaten to change or change the political system in a non-constitutional way. In this respect, the Political instability in home countries makes people loose confidence in their governments and future prospects for a better life because of these individuals who may have difficulties because of their ethnic, cultural, religious belongings or being a member of opposition political groupings in their home countries(Gordon, 1998).

Brain drain problems are inseparable from the issues of good governance and leadership. According to Nguyen (2006), the World Bank defined governance as how power is exercised to manage a country's economic and social resources. Furthermore, the key to good governance is leadership, political will, and political capacity. University governance becomes an integrated system consisting of incorporated and interactive human and material elements that create harmony and balance within the university. The lack of such a system leads to a significant disruption in the university's operations, hence its outputs (Al-Haddad &Yasin, 2018). Tripathi (2017) mentioned that good governance is based on three basic principles: transparency, accountability, and participation. The first principle, transparency, means consistency about what happens within the organization (University), with a simple flow of reliable and impartial information and ease of use and execution by university staff. It is one of the essential global standards in the classification of countries and even universities.

Moreover, it is a mechanism to measure the degree of application of governance in the community. However, lack of transparency will lead to the inability. The second principle is participation which allows governance councils and academic and administrative bodies, students, and the community to participate in policymaking and develop business rules in various areas of university life. Good governance needs to include all stakeholders in order to support the university leadership and governance councils. The absence of participation will lead to the leadership and management of the university, academic and administrative staff, the students, and the community in general not taking part in drawing up the university's policies, regulations, instructions, and by-laws. The lack of accountability will lead to the lack of control among stakeholders that enables them to deal with the executive management and direct their behavior through repeated electoral mechanisms (Papadopoulos, 2003).

In Sudan, governance issues become more complex in higher education institutions as there are no directly identifiable owners and have multiple sources of funds in grants and donations. They are also coalitions of different groups, and their actions are not measurable in financial terms, though they have a tremendous impact on society. It represents the view that colleges and universities should be managed by their most immediate stakeholders, mainly professors, skilled staff, and students (Husni, 2018).

This study is in its theoretical framework, is based on the Leader-Member Exchange Theory, Push and Pull model, and Equity Theory of Motivation.

Leader-Member Exchange Theory (LMX) is a relationship-based or vertical dyad linkage theory that focuses on the nature and quality of the relationship between a leader and his subordinate (Yukl, 2010). The theory describes the ideal is for leaders to maintain their leadership position to develop a high-quality relationship. This relationship will increase subordinates' sense of job satisfaction and organizational commitment, and productivity. Also,

they are expected to be fully committed and loyal to their leader. According to this theory, leadership resides in high-quality exchanges characterized by trust, liking, and mutual respect. This quality has implications for employees' job-related well-being and effectiveness (Erdogan & Bauer, (2015).

Researchers discovered that high-quality leader-member exchanges produced less employee turnover, more positive performance evaluations, higher frequency of promotions, more outstanding organizational commitment. Also, it made more desirable work assignments, better job attitudes, more attention and support from the leader, greater participation, and faster career progress over the years (Northouse, 2018). The mentioned findings clearly illustrate that organizations stand to gain much from having leaders who can create good working relationships. LMX theory functions when focusing our attention on the special, unique relationship that leaders can create with others. When these relationships reached high quality, the leader's goals, the followers, and the organization are all advanced (Northouse, 2018).

Equity Theory of Motivation was introduced in 1963 by John Stacey Adams. It is based on a thriving workplace that can enhance team motivation by treating everyone with respect and dignity. According to Adam's theory, employees who identify a situation of inequality between themselves and their peers will feel demotivated and distressed. For instance, if a staff member knows that their colleague is getting a higher salary than them for the same amount of work, this might create dissatisfaction. In this respect, dissatisfaction leads to the decision to leave the profession. On the other hand, the theory also indicates that the higher the level of equity (fairness) amongst employees, the higher the level of motivation(Adams & Freedman, (1976).

Similarly, the prime reason for employee demotivation is inequity. So, the core of equity theory of motivation explains the balance between the effort an employee or staff exerted in their work and the result they get in return, which means equity is an employee's outputs divided by their inputs (Miner, 2005). In this respect, the Equity Theory of Motivation is a valuable tool for applying workplace psychology and increasing team motivation. If equity is implemented in the workplace, individuals have equal chances of opportunities, leading to an exciting work environment for both the employees and employers. According to Al-Zawahreh and Al-Madi (2012), equity theory predicts that low rewards create dissatisfaction, forcing people to take action and reduce the discrepancy between their ratio and the comparison of others.

The push and pull theory was developed by Ravenstien (1889), Lee (1966), Altbach (1998), in his law of migration, concluded that migration was governed by a push and pull process. In this regard, unfavorable conditions push people and force moving out of the current inhabit the place, while favourable conditions in an external location pull or encourage a person to move out simultaneously. Unfavourable conditions in one place could be represented by oppressive laws, heavy taxation, etc., while other locations with advanced local economic development and better living conditions and career advancement (Wang, 2010). Scientific literature showed there are a lot of migration theories up to this day. The ones that can help understand brain drain and understand migration broader and deeper reasons will be highlighted to be integrated into the push and pull model (Kumpikaite & Zickute, 2012).

Brain drains occur for a variety of reasons, which can be detected by push and pull variables. The pull factors are the aspects of a country that make someone desire to migrate there, while the push factors are the aspects of a country that compel someone to leave. Because there is rarely just one reason for human capital flight, it is necessary to break it down into two categories to better comprehend the complexity of brain drains. The causes and motivations are frequently far more complicated and varied. (Raisa & Habib 2019). Lee created Ravenstein and Stouffer's predictive models to consider a broader range of factors that affected migration

decisions. He came up with the push-pull theory of migration, which considers the importance of both incentives and disincentives in migration in both origin and destination countries. According to Lee, People are more likely to move if there is a perceived disparity in the net forces of attraction in their places of origin and destination. One of Lee's most important findings is the profile of migrants who react to push or pull factors. Lee found that migrants who respond primarily to pull factors in their destination country are more likely to be positively selected (e.g., based on age, education, skills, or motivation) and therefore include highly skilled individuals.

The factors that enter into the decision to migrate are associated with the area of origin. According to Lee (1966), There are numerous factors in every area that act to pull individuals to it and others that tend to repel them. Some of the factors have a similar effect on most people, while others have varied impacts on various people. As a result, a good environment is appealing to almost everyone, while a terrible one is a repellent. Thus a good environment is attractive, and a bad environment is repulsive to nearly everyone. According to Olarinde (2014), migration was considered positive, characteristically voluntary, motivated by economic gains and supply-demand driven in Ravenstein's (1885; 1889) and Lee's (1966) push-pull type models. In this period, migration was simply a consequence of modernization rather than a development failure. The model predicted that the urban population would rise mainly as a result of migration.

In this study, the conceptual framework places the push factor aspects: work environment, career development, political factors, and livelihood as antecedents and and have the power that lead to brain drain among the academics in Sudanese higher education institutions.

Statement of the Problem

The problem of brain drain is facing higher education institutions in Africa in general and the academics of higher education in Sudan in particular. Antecedents force many highly skilled university staff in Sudan to leave the country seeking better life opportunities abroad. There are problems and difficult situations in their educational institutions that lead to such external migration. It remains unclear why many academics in higher education institutions in Sudan migrate their homeland to work abroad, causing brain drain. However, this migration directly impacts educational outcomes and hinders the country's sustainable development (EL-Hassan, 2013, Tessema, 2010). There are about 15775 university teachers in about 35 public universities in higher education in Sudan (Ibrahim, 2015). Statistics showed that about 982 teachers left universities and migrated abroad only in 2012 (Sawahel, 2016). The major destination of the migrants in Saudi Arabia, the Gulf States, The United Kingdom, the U.S.A, and Canada. According to Sawahel (2016), about 1030 (9.32%) out of 11050 academics have migrated in 2013 alone. This is an absolute indication that the brain drain is undermining the development of the country.

The brain drain in the country brought about loss among highly equipped and trained professors. The remarked and the critical point is that there is a substantial increase in the immigration rates for all specializations. The increase was significant in many professions such as university professors, where more than 900 teachers left the country in one year (El-Imam & Yusuf, 2013). Ibrahim (2015) found out that what caused problems of staff migration in Sudanese universities is the insufficiency of financial support for scientific research. Add to that, Elhadary (2010) found out that the university environment, lack of research policy, and lack of academic freedom provoke migration. Despite the studies conducted about push factors, there is still an increase in migration. Also, complications in promotion parameters and publishing as career advancement aspects that influence migration were ignored and not clearly

or comprehensively fulfilled. Understanding the status of push factors significantly helps to manage the problem of brain drain. Based on the researcher's work experience in higher education as a teaching staff, the researcher thinks many academics still migrate, seeking better opportunities to work abroad. Therefore, the concern is not who decided and left instead of those who aspire to migrate. This study investigates the level of push factors of brain drain among the academics in the Sudanese higher education system. To that effect, the study is guided by the following research questions:

1- What is the level of work environment, career development, livelihood, and political factors in Sudanese academics brain drain?

2- Do work environment, career development, livelihood, and political factors have an independent effect on Sudan academics brain drain?

3- Is there a significant difference in susceptibility to brain drain based on teaching experience in the study area?

Methodology

Research Design

This study intended to examine the power of push factors on academics of the higher education system in Sudan. It employed a mixed-method applied to collect and analyze data. Creswell (2012) stated that this approach was used because it gives the study a better understanding than qualitative or quantitative alone. Among the different mixed methods, a convergent parallel design was employed because this model provides a complete understanding of the research problem and combines the advantage of each form of data (Creswell, 2012). Also, this model permits researchers to triangulate results from the separate quantitative and qualitative components of the research and then merges the two sets of the results into an overall interpretation within a single study (Teddlie &Tashakkori, 2009). This method was chosen because the researcher seeks to build on quantitative and qualitative data to address the research questions perfectly and obtain different but complementary data on the same topic to understand the research problem best. The quantitative data was first collected through a developed questionnaire about push factors for brain drain in the study. The data was analyzed then triangulated with the qualitative data.

Sample and Data Collection

The population of the study was university staff members in higher education in Sudan. There are 35 public universities in the country. In these 35 universities, there are about 15775 teachers of different academic rank. Teachers who are currently working in higher education institutions were the focus of the study. Eight public universities out of the total 35 universities were selected randomly to focus on the study. To determine the sample size of the study, Yamane's (1967) formula has been applied. According to this formula, about 390 samples were involved in the study. A 10% (39) sample was then added to the sample size to compensate for nonresponse or lost questionnaires. For the eight selected public universities, the sample was determined through a proportional allocation method. This method was used because it can estimate the sample size with a higher degree of precision, and the individuals selected are proportional to their representation in the total population (Creswell, 2012). In sum, 380 participants filled out and returned the questionnaires. Besides, ten teachers, 10 Deans, and 10 Head Department, 30 in sum, were selected purposively and interviewed independently. The collection of qualitative data was limited to two universities (West Kordofan and Khartoum).

Primary data for this study was collected by self-prepared instruments (questionnaires, one-to-one interviews, and focus group discussion), all of which were conducted after translation into Arabic to enhance communication. A multiple data collection (data

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triangulation) method was applied to refine personal perceptions further and tap the advantages of data triangulation (Cohen et al. 2007; Gay et al., 2009). A five-point Likert scale (SA= Strongly Agree; A= Agree; N= Neutral; DA=Disagree; SDA= Strongly Disagree) was designed for all the subscales of the questionnaires. Five items incorporating 14 items in the work environment, 11 items in career development, four items in livelihood, five items in political factors, and six items in higher education managing brain drain were administered.

The questionnaire was piloted at West Kordofan University, a similar setting with the universities included in the study to ascertain reliability and validity factors. The comments secured from experts also approved both the content and construct validity of the instruments. Although the questionnaires demonstrated good internal consistency and homogeneity among the sub-scales in each package, some items were excluded based on the feedback from the participants and on the inter-item correlations indicated by the pilot data analysis. The reliability coefficients (Cronbach Alpha) of the sub-scales in each package after improvement were 0.806, 0.653, 0.850, 0.791, 0.676 and 0.686 respectively. According to Creswell (2014) and Larson-Hall (2010), all these values were considered suitable for the current study because $\alpha = 0.70$ is often considered the lowest acceptable value for a questionnaire with less than 20 items.

Analysis of Data

A thematic data analysis that implemented the descriptive (mean and standard deviation) and inferential (between the group and within-group *t*-test) statistics were manipulated by using the Statistical Package for Social Sciences (SPSS-25) computer software. Five percent ($\alpha = 0.05$) significance was applied to determine whether groups of scores are significantly different. Because it is often a conventional standard degree of significance for educational and behavioral studies (Creswell, 2012), to help refine (triangulate) the quantitative data results from qualitative data gathered through interview guides, it will be analyzed thematically by embedding them in the quantitative data.

Findings/ Results

The status of push factors aspects among public Higher Education Institutions.

The first question in this study is about the status of work environment, career development, livelihood, and sociopolitical factors as push and pull factors for public HEI in Sudan. Firstly, a one-sample t-test for the push factors was treated in Table 2, then the pull factors in Table 3.

Table 1

One-sample t-test results of push factors status among HEIs.

		Test value = 3					
N	Factors	N	Mean	SD	T	df	P
1	Work environment	380	3.0970	.53184	3.555	379	.000
2	Career development	380	3.0699	.78317	1.739	379	.083
3	Livelihood	380	3.4829	.74307	12.668	379	.000
4	Political	380	2.9916	1.09936	-.149	379	.881
	Total	380	3.1603	47288	130.277	379	.000

As shown in Table 1, the work environment mean score is 3.0970, $t(1,379) = 3.555$, $p < 0.05$. The result indicates that the level of work environment is significantly above the expected mean. This means that the respondents agree that the working environment is the pushing factor. Thus, the academics are dissatisfied with their current work environment and assigning duties and responsibilities in the workplace. As for career development the mean score is 3.0699, t (1,379)

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=1.739, p > 0.05. Although the result revealed that career development is insignificantly higher than expected, academics were unsure about their dissatisfaction with career aspects. The results show a high mean score of 3.4829, t (1,379) =12.668, and p < 0.05. The result indicates that livelihood is significantly above the expected mean. Meaning that academics were dissatisfied salary offered and the package of benefits they got. Concerning the political factors, the mean score is 2.9916, t (1,379) = -.149, p > 0.05. The results indicated that political factors are non-significantly away from the expected mean, which means that respondents were not in a position to agree or disagree with the pushing factor due to the nature of the political environment in their organization**.** The overall results of the analysis showed that participants strongly agree that the status of work environment, career development, and political factors pushed many academics to leave the country.

Data gathered from the Head Department, Deans of colleges, and teachers in the interview and focused group discussion concerning the work environment similarly reflected the dissatisfaction of academics about the status of the work environment. The participants described the universities as acceptable with poor preparation infrastructure in halls, laboratories, technological facilities, and other work aids. Concerning career development, interviewers indicated that promotion in higher education institutions is very complicated and demanding because publishing as a fundamental condition encountered many complications in terms of funding. They also criticize the parameters for promotion to be connected with publishing. In terms of livelihood, interview participants reflect their dissatisfaction with the salary offered and the benefits and remuneration system employed in the university. As for the political factors, interviewers thought there were the instability of the political environment and the spread of corruption that forces many academics to migrate.

2. The status of pull factors aspects among public Higher Education Institutions

Table 2

One sample t-test results of the pull factors status among HEIs.

		Test value = 3					
N	Factors	N	Mean	SD	T	df	P
1	Work environment	380	3.9010	.82812	21.208	379	.000
2	Career development	380	4.0572	.74055	27.830	379	.000
3	Livelihood	380	4.3695	1.02883	25.948	379	.000
4	Political	380	3.4647	.84661	10.701	379	.000
	Total	380	3.9481	.65478	117.540	379	.000

As can be seen, in Table 2, the work environment as pull factor's mean score is 3.9010, t (1,379) =21.208, p < 0.05. The result indicates that the level of work environment is significantly above the expected mean. This means that respondents agree that work environment aspects could influence academics' decision to migrate attracted them to work abroad. As for career development, the mean score of 4.0572, t (1,379) =27.830, p > 0.05; the results indicate that career development is significantly higher than the expected mean. This result conclusively showed that respondents strongly agree that career development influences the migration of academics. Concerning livelihood, the results show a high mean score of 4.3695, t (1,379) =25.948, p < 0.05. The result indicates that livelihood is significantly greater than the expected mean. This means that respondents are in a position to agree that the status of livelihood pulls the academics and made them susceptible to brain drain. Concerning the political factors, the mean score is 3.4647, t (1,379) = 10.701, p > 0.05. The results indicated that political factors are significantly above the expected mean. The grand mean 3.9481, t (1,379) =117.540, p < 0.05. This result clearly showed that the overall pull factors are significantly greater than the

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expected mean. Participants strongly agree that the work environment, career development, livelihood, and political factors made the academics attracted by strong pull factors abroad.
Interview data gathered from Head department teachers, deans of colleges, and teachers perceived that the work environment might be attractive and opportunities for career development. Similarly, interviewees indicate that there is a wide range of affordable costs of living abroad. However, the fact is that knowledge of the destination area is seldom exact. Meaning that precise reasons for pull factors were difficult to predict because there is always ignorance about the destination, so only perception (Lee, 1966).

3. Push factors independent effect on Sudanese academics brain drain

A simple linear regression analysis was conducted to examine whether each work environment, career development, livelihood, or political as push factors have an independent effect on brain drain.

Table 3

Linear Regression Results of push factors affect on Sudanese academics brain drain.

Model	β	SE	B	t	P
(Constant)	.504	.226		2.229	.026
Work environment	.652	.078	.416	8.355	.000
Career development	.279	.055	.262	5.033	.000
Livelihood	.130	.045	.116	2.883	.004
Political factors	-.110	.029	-.145	-3.774	.000
Total	.772	.80	.438	9.625	.000
Overall R^2	.491				

As shown in Table 3, the regression model R2 (.491) statistically indicates a good level of prediction. When brain drain was predicted, the work environment ($\beta = .416$, $p < .05$) was a significant predictor. Also the career development ($\beta = .262$, $p < .05$) was a significant predictors, Political factors ($\beta = -.145$, $p < .05$) was a significant predictor, but the livelihood ($\beta = .116$, $p < .05$) was not significant predictor. Hence, in this case, the work environment is the highest contributing ($\beta = .416$) predicator to explain the brain drain. Next to that, career development ($\beta = .326$), which means both the work environment and career development as push factors greatly influence academic decisions related to migration out of the country. Although the four factors were found to show a statistically significant positive impact on brain drain, the livelihood and political factors could not have an independent effect on brain drain likewise the other two.
These findings were consistent with Akusoba (2014), indicating push factors such as poor work conditions and are the major factors that force teachers and workers to migrate, searching for better opportunities to fulfill their needs. In an interview, participants similarly believe that the absence of transparency in the workplace and perceiving participation in an important decision in the university affairs were behind deciding to leave the university in particular and the entire country. In FGD, some participants pointed out that academics leaving the country are the poor work environment and the lack of prospects in career advancement.

4. Pull factors independent effect on Sudanese academics brain drain.

A simple linear regression analysis was conducted to examine whether each work environment, career development, livelihood, or political as pull factors have an independent effect on brain drain.

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Table 4

Linear Regression Results of pull factors effect on Sudanese academics brain drain

Model	β	SE	B	t	P
(Constant)	4.320	.252		17.171	.000
Work environment	-.294	.061	-.292	-4.814	.000
Career development	.262	.073	.233	3.594	.000
Livelihood	.007	.045	.009	.153	.879
Political factors	-.221	.058	-.225	-3.824	.000
Total	-.311	.058	-224	-5.370	.000
Overall R^2	.116				

As shown in Table 4, the regression model R^2 (.116) statistically indicates a good level of prediction. When brain drain was predicted, the work environment (β = -.292, p <.05) the work environment were a significant predictor. Also the career development (β = .233, p <.05) was a significant predictors, Political factors (β = -.225, p <.05) was a significant predictor, but the livelihood (β = .009, p <.05) was also non-significant predictor. Hence, in this case, career development is the highest contributing (β = .233) predicator to explain the brain drain. This means that career development as an aspect of pull factors greatly influences academics to decide to leave the homeland and migrate.

Concerning overall push and pull factors, when brain drain was predicted, it was found that push factors (Beta = .438, p <.05), were significant predictors. Pull factors (Beta = -224) were not significant predictors. Meaning that push factors aspects of the work environment, career development, livelihood, and political factors are predictors of brain drain. So, they influence the academic to leave their homeland and migrate. The findings of this question are consistent with Akusoba (2014) revealed that push factors such as poor salaries, poor work conditions, and poor leadership are the major factors that force teachers and workers to migrate, searching for better opportunities to fulfill their needs. As a result of the regression results and the data obtained from interviews and focus group discussions, it is possible to conclude that push factors such as work environment, career development, livelihood, and political factors are predictors of brain drain. Meaning that they have an independent effect on influencing academic migration.

5. The significant of teaching experience in susceptibility to brain drain in the study area.

Table 5

ANOVA results of Push and Pull Factors in terms of the years of teaching experience at university

Factors		Sum of Squares	df	Mean Square	F	Sig.
Push & pull	Between Groups	3.128	4	.782	4.512	.001
	Within Groups	64.989	375	.173		
	Total	68.117	379			

The results in table 5 indicates a very high f value where f =.4.512, p > 0.05 which indicates that there is statistically insignificance difference between push and pull factors to determine the migration of higher education staff based on their years of teaching experience. So, years of teaching experience are determinant factor for migration of higher education. To capture clarity in this aspect, a comparison of variances in teacher's years of experience.

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Table 6 ***Comparison of variance of teacher's years of experience***

Years of teaching experience	1	2
20 years and more	231.3158	-
Less than five years	238.6286	238.6286
15 -20 years	239.5227	239.5227
10 – 15 years	-	246.2973
5 -10 years	-	246.5854

It is evident from Table 6 that, there is a significant difference between professors whose years of experience exceed 15 years and whose years of experience are less than five years. Also there is difference between those whose years of teaching experience at the university are in the range of (5 – 15 years). While there is no difference between professors with more than 15 years of experience and those with less than 5 years of experience. The results of the analysis reveals that senior professors and junior ones face the same situation in the country .It is also clear that the average years' experience between 10 to 15 years have the tendency to migrate and leave the country expecting better opportunities abroad.

Discussion

The study's overall purpose was to examine the level of push factors of brain drain among the academics in the Sudanese higher education system. After implementing analytical techniques, the research came up with the following major findings.

The first research question examined the level of work environment, career development, livelihood, and political factors in Sudanese academics' brain drain. The findings concerning the work environment indicated a greater mean at the highest level as a push factor aspect of brain drain. Meaning, academics were dissatisfied with the status of the work environment in higher education institutions. So, it is clear that the work environment has a significant role in forcing academics to migrate. The participants interviewed reflected their dissatisfaction with the absence of any efforts to improve the environment and increase their income. This result is in line with Semela, (2011) contend that academics who are contemplating to leave the country complained the existing working condition was not favorable. According to Lee et al. (2014), a work environment should be effective in utilizing the space and providing a comfortable workplace that makes employers' work more effective and efficient. This implies that if the work environment improved to staff expectations, academic freedom, and transparency maintained, that will help them remain in the country. It is also found that universities have poor preparation with work aids and facilities, which affects the performance of academics.

Regarding career development, the results indicated that no significant and above the expected mean. According to Lee et al. (2014), an institution should strive to create a workplace environment concerned for employee growth and development. Promoting parameters connected with publishing articles without allocating funds and slow or discriminated promotion demoralized the staff. So, the teachers are dissatisfied with the proportion of funds allocated for research which is the major requirement and fundamental condition for promotion in higher education institutions. Borta (2007), supports this argument stating that the support for research and demand for research and development staff and academics is also an essential determinant in the migration decision and destination. The results also revealed inequitable opportunities for participating in international scientific conferences and workshops abroad. According to Mugimua (2010), promotion, lack of career opportunities, lack of equitable opportunities to attend conferences, training, and publishing hinder advancement in a career.

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This idea is supported by Lee et al. (2014) stated that employees might find a more rewarding job and they could achieve their growth and development prospects.

For this reason, many academics think the solution is to migrate seeking these opportunities abroad. Not less important than that, barriers to career development and advancement access to publishing that facilitate academics in their promotion need to go through for vast opportunities. In terms of livelihood, the results indicate that salaries, the benefits, and the remuneration system employed in the university have significance to encourage or discourage the staff from staying or leaving. These results are consistent with Akusoba (2014) results indicating push factors can be manipulated positively by making adequate funds available. Salaries and wages of workers should be increased to motivate and maintain optimal performance. As for the political factors, the results reveal the instability of the political environment, which affects the continuity of work and the stability of academic performance. Add to all that the spread of corruption in many higher education institutions as informed by interview participants.

The second question examined whether the work environment, career development, livelihood, or political factors have an independent effect on Sudan academics brain drain. The results revealed that the work environment is the highest contributing predictor to explain the brain drain, which means that the work environment greatly influences academics to leave the homeland and migrate. Interview data gathered went in the same vein, indicating that the work environment in universities is to some extent acceptable; however, it has poor infrastructure and preparation of work aids and facilities. It is below the expectations of the academic. So, poor work conditions and environment are the major factors that force academics to migrate, searching for better opportunities to fulfill their needs. Based on the results of the interview and focused group discussion, it could be possible to conclude that work environment factors have an independent effect and significant influence on the academics migration. To that end, it is essential to improve the work environment to the standard that satisfies the expectations of the academics. The improvement can take the form of equipping universities with facilities, technological aids, and concrete infrastructure that will help increase academic performance.

On the other hand the findings indicated that the years of teaching experience has significance and are determinant factors for migration. It is clearly seen that academics whose range of experience between (10 – 15 years) have tendency towards migration.

Conclusion

The findings of this study clearly show that the migration of academics in Sudan is influenced mainly by the work environment as an aspect of push factors. The findings showed that academics tend to work in an environment with better working conditions, sufficient infrastructure and facilities, higher salaries, and remuneration. So, monetary considerations play a role in making significant migration decisions. It is also clear that in order for higher education to manage brain drain, good governance and leadership practice is required. It is the kind of visionary leadership capable of creating a conducive environment and better workplace conditions. It can be concluded that the push factors aspects play a role in raising the proportion of academics unless aspects are addressed and resolved in the homeland. It will help retain employees in the country. %). On the other hand the findings indicated that the years of teaching experience has significance and are determinant factors for migration. It is seen that academics with experience between (10 – 15 years) tend to migrate.

Recommendations

The higher education sector in Sudan is experiencing substantial challenges and difficulties; brain drain is one of them. This study dealt with the push factor issues that need to be addressed at a policy level. Based on the significant findings of the study and the conclusions drawn, the following recommendations are forwarded: The findings showed that higher education academics emphasized their dissatisfaction with work environment aspects. So, educational leaders and policymakers are recommended to exert more effort to establish an attractive environment in universities and enforce proper sound strategies to create rewarding conditions to encourage launching investment in higher education. To this end, policymakers and funding agencies can pass legislation to open the flat for the private sector to enlarge their investment in higher education. Establishing high-quality standard private universities with good service conditions to fill the wage gap for academics in public universities will absorb the migration. Also, the issue of governance in higher education required significant consideration. So, the government leaders are recommended to value transparency and meritocracy over nepotism in assigning persons for leading positions based on their leadership characteristics.

Limitations

Research work cannot be free from limitations. To this end, the limiting factors include the uncooperativeness of respondents in filling the questionnaires and health situations in the country. The researcher acknowledged the limitations for various reasons. Firstly, there were very few available types of research and studies or papers about brain drain among academics in Sudan. Therefore, the researcher was obliged to rely on some African and Arab university studies with the same context and status as Sudanese ones. However, the scarcity of studies makes it an exciting area to write about, especially since it has lost many university academics and teaching staff. Secondly, the health situation in the country during data collection could have led to teacher's responses to unsatisfied expectations because many were not available. Finally, the problems also included the difficulty conducting the interview or meeting the Vice-chancellors as proposed because they were always busy and preoccupied with demanding schedules.

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