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Obstacles Encounter Head Nurse' Role Excellence: Development and Validation of a Research Instrument

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Abstract: Background: Head nurses play one of the most challenging roles in organizational healthcare. They directly managing the nursing staff at unit level and ensuring that they act in accordance with hospital rules and procedures. Head nurses also, have a significant managerial impact because they have the ability to influence the performance and quality of healthcare organizations. They are faced with many obstacles in their daily work that might encounter their excellence performance. **Aim:** The study aimed to develop an obstacles encounter head nurse' role excellence instrument. **Research design:** Methodological research design was used to conduct this study involving the use of both qualitative and quantitative methods. **Setting:** The study was carried out in eight hospitals at Qalyubia Governorate as follows: Benha university hospital, Benha educational hospital, and Benha fever hospital, Benha ophthalmology hospital, Sheben El Qanater fever hospital, Sheben El Qanater central hospital, Toukh central hospital, and Toukh fever hospital. **Sample:** Two samples were utilized to achieve study' purpose; multistage random sample included 104 head nurse (was utilized for gathering qualitative data that was required to define the main domains and themes which make up the instrument), and convenience sample consisted of 160 head nurse (was utilized to test the reliability and construct validity of the developed instrument). **Instruments:** three instruments were used in this study: (a) An obstacles encounter head nurses' role excellence open-ended questionnaire, (b) obstacles encounter head nurses' role excellence version one, and (c) obstacles encounter head nurses' role excellence version two. **Results:** the study revealed that developed instrument has high score for content validity index (.92) deducted that sample of items for the construct being measured was appropriate, Cronbach's alpha coefficient was calculated to be good (.93), Kaiser-Meyer-Olkin was high (.76), Bartlett's test was highly significant, and varimex rotation extracted four components with eigenvalue >1.0 and accounted variances ≥ 40%. **Conclusion:** The final version of developed instrument is considered to be valid and reliable based on statistical analysis. It contains 46 items within four domains categorized as follows: obstacles related to working conditions, obstacles related to head nurses, obstacles related to nurse managers at middle and top levels and obstacles related to staff nurses. **Recommendations:** it recommends that: using the developed instrument to assess obstacles encounters head nurses' role excellence in different healthcare settings, examine obstacles encounter head nurses from senior managers and staff nurses' point of view. Furthermore, develop strategy to overcome obstacles.

Key words: *develop instrument, head nurses, obstacles, role excellence,*

Introduction

Head nurses are leaders of the nursing teams. Their role is crucial in the nursing staff development and retention, the responsibility of head nurses is to assure that hospital mission translated into daily practice (Jusufi & Jaha, 2017, and Kelsey& Holly 2020). Also, head nurses are key individuals in creating, maintaining a healthy work environment, and achieving best staff work and satisfaction. They must be able to deal with daily obstacles to maintain good working conditions while managing the nursing staff (Tyrrell, 2021).

Head nurse responsible for operational planning, he/she is responsible for day to day activities of the unit, clinical nursing practice, patient care delivery and compliance with regulatory and professional standards through assigning tasks to nurses, managing work flow, monitoring the work quality, dealing with patient and nurses problems, and reporting the problems to middle managers and executive managers and maintaining the green management of the unit (Gunawan et al., 2018 & Blok et al., 2022). Moreover, head nurse is responsible for supervising the work of non-managerial personnel, utilization of human, fiscal and other resources, and fostering interdisciplinary, collaborative relationships, With primary responsibility for motivating the staff to achieve the organizational goals, in addition to, the head nurse represents staff to upper administration and vice versa to maintain excellence performance for health care organization (Hughes, 2018 & Hughe, 2021)

Excellence role can be defined as a state of high quality, superiority, eminently good, superior performance or first class (Wiggens & Hyrkas, 2011). It is not a new topic in nursing management literature, but rather has been a focus of interest since the early 1990s. In the 20th century, the pursuit of excellence emerged as a recurring issue, and authors have written on it from a variety of angles in the field of health care and one could argue that the path to excellence has been adequately explained today. Head nurses role excellence is frequently evaluated in terms of initiative, quality improvement, best patient outcomes, staff nurse satisfaction and retention, having a vision for the future, and encouraging future nurses to flourish (Abo Baraka, et al., 2022). The obstacles for reaching and maintaining role excellence for head nurses need more explanations (Tyrrell, 2021).

Head nurses face many obstacles in describing their ideal role. To apply quality and magnet standards, they currently compete inside a management framework. And to excel both in respect to their organization and themselves, they must take action (Jazaery & Khaleel , 2016). They face many problems that encounter their better achievements (Hughe, 2021). Some of them related to their lack of experience in managerial, conceptual and personal skills (Naidoo, 2017). Others related to staff nurses attitude as their resistance to change, or less commitment (Abo Gad, 2018). Moreover, when strive to achieve excellence may face improper hospital nurse manger attitude or practice at both middle and top levels. They may have to act within centralized authority, improper organizational structure, one way communication, or lack of support and respect from them (Rankin & Matthews 2016).

According to Abdallah et al., (2019) staff nurses can help or encounter head nurses to achieve their high performance in their role. Staff nurses

who hold high knowledge and skills for their performance can make head nurse role more easily because they rarely resist change. Furthermore Gunawan, et al., (2018) mentioned that ineffective or unsuitable working conditions affect the role and performance of head nurses. This can be articulated in the form of unclear performance standards, inadequate equipments supplies, folded information or working within diverse culture especially when nursing staff has little or no culture intelligence.

The systematic creation of a research instrument is considered as a demanding and difficult endeavor. It is regarded as a pillar for scientific inquiry and the advancement of knowledge (Kuskova et al., 2011 & Farrés et al., 2021). A valid and dependable research instrument that can produce correct data when utilized in data collection must go through three stages. The first stage focuses on the theoretical significance and presence of the primary domains, themes, and items that make up the instrument, and it uses a panel of experts to ensure the constructed instrument's validity. The second phase, which involves performing a pilot test and gathering data from the study subjects, addresses the representativeness and appropriateness of data collection. The third stage examines statistical analysis and constructs evidence to look into the instrument's dependability (Lau et al., 2018 & Yusoff, 2019 and Sirvent et al., 2022).

Significance of the research:

Head nurses are directly responsible for managing hospital patient care units, with the expectation that care would be provided with high standards, at a reasonable cost, and with the accomplishment of patients' clinical outcomes and satisfaction levels (Abdallah et al., 2019, Kelsey &, Holly, 2020). From the researchers' point of view; for nurses and hospitals to survive and prosper, excellent head nurse role is essential. And from their readings in Egypt little is known about obstacles encounter head nurse' role excellence and limited studies investigated these obstacles. Also, there is no instrument developed specifically to measure them. It's hoped that this instrument can be used to assess these obstacles and help in overcoming them by nurse managers, head nurses, and staff nurses. And to be able to develop strategy for dealing with them to sustain that role excellence. Therefore, the study conducted to develop an obstacles encounter head nurse' role excellence instrument.

Aim of the study

To develop an obstacles encounter head nurse' role excellence instrument.

Research question:

What are the dimensions and items of the instrument for obstacles encounter head nurse' role excellence?

MATERIALS AND METHOD

Materials:

Design:

Methodological research design was used, involving the use of both qualitative and quantitative methods.

Setting:

The study was carried out in eight hospitals at Qalyubia Governorate as follows: Benha university hospital, Benha educational hospital, and Benha fever hospital, Benha Ophthalmology hospital, Sheben El Qanater fever

hospital, Sheben El Qanater central hospital, Toukh central hospital, and Toukh fever hospital.

Subjects:

Two samples were utilized to achieve study' purpose. (Rafati et al., 2021).

Sample one (subjects for qualitative part):

Multistage cluster sampling was used to select the sample of the qualitative study part. It was utilized for gathering qualitative data that was required to define the main domains and themes which make up the instrument. It was selected through the following stages:

- **1st stage:** study entire population was decided (Head nurses). Then sample frame was established included a list of the seven Centers of Qalyubia governorate (Benha, Qalub, Sheben El Qanater, Shoubra, El Khanka, ELqanter Elkhairia, and Toukh). Three centers were selected randomly (named; Benha, Sheben El Qanater, and Toukh).
- **2nd stage:** All main governmental hospitals at the three selected centers were listed as follows: Benha center involves five hospitals named; Benha University hospital, Benha Ophthalmology hospital, Benha fever hospital, Benha teaching hospital, and Benha chest hospital. Sheben El Qanater center involves three hospitals named; Sheben El Qanater fever hospital, Al ahraz hospital, Sheben El Qanater central hospital. Toukh center involves three hospitals named; Toukh central hospital, Toukh fever hospital, and Sanhara hospital).
- **3rd stage:** Six hospitals were selected randomly (two hospitals from each center of the three selected centers) named; Benha University hospital, Benha Ophthalmology hospital, Sheben El Qanater fever hospital, Sheben El Qanater central hospital, Toukh central hospital, and Toukh fever hospital. Then head nurses' number in every hospital of the six selected hospitals was calculated to be (80, 45, 19, 27, 21, and 15 respectively). Total head nurses = 207.
- **4th stage:** To calculate sample size Epidemiologic information (EPI. INFO) proportionate sample size estimation statistical program was used with the following parameters: estimated proportion 50%, allowable error 10%, and confidence coefficient 95%. Sample was calculated to be 104 head nurse. And according to Hennink & Kaiser, (2022) this sample size is very good for achieving saturation in qualitative research. The head nurses involved in sample were selected randomly from previous mentioned six hospitals and their representative in the sample was determined in proportion with their number in each hospital.

Sample two (subjects for quantitative part):

Convenience sample was used to complete the quantitative part of study (it was utilized to test the reliability and construct validity of the developed instrument). Included all head nurses who are working and were available at the time of data collection in the three following hospitals: Benha university hospital (80 head nurse), Benha educational hospital (34 head nurse), and Benha fever hospital (46 head nurse). Total = 160 head nurse.

Instruments

Three instruments were used in this study.

I: Obstacles encounter head nurses' role excellence open-ended questionnaire:

It consisted of two parts:

- Part 1: Personal characteristic: it include personal data of study subject (age, gender, marital status, educational level and experience)
- Part 2: Open-ended questionnaire: to identify view of point of head nurses about obstacles encounter their role excellence. It consists of two questions:

✓ What do you think about obstacles encounter your role excellence?

✓ From your point of view what are the sources of these obstacles?

The questionnaire was translated into Arabic.

II Obstacles encounter head nurses role excellence instrument Version one:

It had 50 items/ questions grounded in four domains as follows: obstacles related to working conditions (14 questions), obstacles related to head nurses (13questions), obstacles related to hospital nurse managers at middle and top levels (12 questions), and obstacles related to staff nurses (11 questions).

III: Obstacles encounter head nurses role excellence instrument version two:

It consisted of two parts:

- Part 1: personal characteristic: (same as mentioned in instrument I)
- Part 2: Obstacles encounter head nurses role excellence instrument version two: It had the same 50 questions grounded in four domains which previously mentioned in version one with modification and rewriting of seven items based on panel of expert' opinions.

Method:

Developing the instrument:

The current study was based on Kuskova et al. (2011), Tabachnick &Fidell (2014) & Lau et al., (2018) & Yusoff, (2019) and Sirvent et al., (2022) ten instrument development steps which were grouped into three phases.

Phase I: Theoretical importance and existence of the construct:

The purpose of this step was to determine the content domains, generating the pool of the items / questions, evaluate the validity of the content, and accordingly develop the instrument.

- **Step 1: Content domains specification**

This step aimed to determining the main domains of obstacles encounter head nurses role excellence and it was achieved through extensive review of literature (Weis & Tappen, 2015, Pabico, 2018, Kenrick et al., 2020, and Milinkovic & Kovacevic, 2020). And analyzing data obtained from semi structured interview using pre-mentioned open-ended questionnaire (Unver, 2017). Interviewing with head nurses (Sample one) was conducted through three months (from the beginning of June to the end of August 2021), in order to determine the proposed obstacles encounter head nurse role excellence from their points of view. Data were collected about (3 days\ week) through individualized interview based on interview guide, each head nurse interviewed for about 30 to 40 minutes, and about 3-4 head nurses were interviewed per day.

Notes took and content analysis was applied through coding qualitative data and categorized themes based on

similarities and proposed relations. In this study data saturation was achieved after interviewing the first 90 head nurse of the sample (104); however researchers interviewing the remaining 14 head nurse to ensure data saturation (no new codes appear). Moreover, the data revealed from literature review were used for describing the main domains. The analyses of the qualitative data yielded four domains (obstacles related to working conditions, obstacles related to head nurses, obstacles related to nurse managers at middle and top levels and obstacles related to staff nurses).

- **Step 2: Generating a pool of items / questions for obstacles encounter head nurses' role excellence instrument:**

In this step items / questions for version one of the instrument were identified by synthesizing domains/ themes generated from interview notes and questionnaire, and literature review.

- **Step 3: Content validity evaluation:**

The goal of this step was aimed to examine the face and content validity of proposed instrument version one. It was established through a panel of 30 experts' members in specialist of nursing administration from different faculties of nursing who were given the content validity form. It asked the experts to read and rate the domains and questions for instrument version one, developed in step two, according to perceived strength of relevance using the content validity index (CVI). It consists of the following four point likert scale: 1 = not relevant, 2 = somewhat relevant, 3 = quiet relevant and 4 = very relevant (Yusoff, 2019). Each question content validity was calculated as the proportion of the content experts giving a relevance rating to the question. While the content validity of the whole instrument was calculated as the proportion of questions relevancy. The domains and questions agreed upon by all experts are included in version two and question validity ≤ 0.70 was revised (Yusoff, 2019 & Sirvent, 2022).

- **Step 4: Instrument development;**

Depending on the results of the instrument content validity, seven questions were revised as they had validity results ≤ 0.70. This resulted in the version two of the instrument which composed of 50 questions grounded in the pre -mentioned four domains. (The Content Validity Index for developed instrument (CVII) was .92.)

Phase II: Representativeness and appropriateness of the data collection.

The purpose of this phase was to test the applicability of version two of the instrument through the three following steps: translation, pilot test, and data collection.

- **Step 5: Instrument translation:**

The version two was translated into Arabic and the translated form became ready for use.

- **Step 6: Pilot test**

The goal of this step was to determine the feasibility and the difficulties in using the instrument. 16 head nurses who represented 10% of total (sample 2) were given version two of the developed instrument. Based on the result of the pilot test, three questions were rewarded in version two.

- **Step 7: Data collection:**

This step aimed to test the reliability and construct validity for version two of the developed instrument. Data were collected (from sample two) using the instrument version two. The data collection took about one month (November 2021). (3 days\ week) through distribution of version two of instrument for head nurses, they were asked to fill independently the instrument , it took about 20-25 minutes to fill it, the average number of collected questionnaire was 10-15 questionnaires per day.

III. Phase III: Statistical analysis and statistical evidence of the construct

- **Step 8: Reliability assessment:**

Reliability assessment was conducted to determine the internal consistency and homogeneity of the newly developed instrument. Reliability was assessed by Alpha - Cronbach coefficient test (Farrés et al., 2021).

Factors analysis:

- **Step 9: Dimensionally assessment:**

Dimensionally assessment was concerned with measuring the homogeneity of questions making up the developed instrument. It was done to determine whether the questions assess single underline factor or construct (Tabachnick, & Fidell, 2014). Explanatory factor analysis (EFA) was done through principle component analysis (Brown, 2015).

- **Step 10: Construct validity**

Construct validity assessment was measured through Varimex rotation which determine the factor loading (what are the variables (items) which could be loaded in each factor (domain). Questions load in a domain relatively strongly and weakly on other domains are candidate for retention (Brown, 2015 & Farrés et al., 2021).

Instrument Refinement

Based on the results of factor analysis four items (no: 5, 17, 26, 29) were deleted or excluded. So, the final version of the developed instrument for obstacles encounter head nurses' role excellence had 46 questions grounded in four domains as follows: the first domain was named obstacles related to working conditions; it includes 13 questions (no: 38-50), the second one was named obstacles related to head nurses; it includes 11 questions (no: 25, 27,28,30-37), the third one was named obstacles related to hospital nurse managers at middle and top levels; it includes 12 questions (no: 1-4, 6-13), finally the fourth one and was named obstacles related to staff nurses; it includes 10 questions (no: 14-16, 18-24).

The scale for measuring the responses of questions is the five - point likert scale as follows: rarely (1), sometimes (2), often (3), usually (4), and always (5). The scoring system is: less than 60% for low level of obstacles, from 60% to less than 75% for moderate level of obstacles and ≥ 75% for high level of obstacles.

Ethical considerations:

An approval of the Ethical and Research Committee in the Faculty of Nursing, Benha University was presented to the hospitals administrators describing the study aim. The researchers meet with hospital managers to explain the aim of the study to gain their acceptance, participation, as well as organizing and arranging the head nurses participation according to their availability and feasibility. Then the researchers started

by introducing themselves to each head nurse and gave explanations about the purpose of the study and getting agreement of them to participate in the research. At the interview with nurses to collect data they informed about the purpose and benefits of the study, and they were informed that their participation is voluntary on that they have the right to share or refuse to participate in the study at any time without giving any reason. In addition, confidentiality and anonymity of the subjects were assured through coding of all data.

Statistical design

Statistical analysis was done using statistical package for the social sciences (SPSS version 20). Using the following statistical tests: Content validity index CVI; was used to determine item validity, Cronbach's alpha coefficient; was used to test reliability, Explanatory factor analysis (EFA) was done through principle component analysis to the following: KMO; used to determine sample adequacy , Bartlett's test; used to determine significance, and principal component analysis (PCA) and varimex rotation; to run factor analysis in order to determine factor numbers and item loaded in each factor for developed instrument.

Results

Table (1); Presented frequency and percentage distribution of head nurses' personal characteristics (Sample 1). It showed that the highest percentage (40.5%) of head nurses age were between 30-40 years. Regarding their gender most of them were female (90.5 %). Also, the majority of them were married (88.5 %). In relation to their educational level; more than half (53%) of head nurses had Bachelor of nursing. In additions, the highest percentage (38%) of them had 15 and more years of experience

Table (2): Illustrates frequency and percentage distribution of head nurses' personal characteristics (Sample 2). In relation to personal characteristics of head nurses it shows that more than half of head nurses (51.2, 67.8, 58.7 %) age were between 30-40 years at Benha University, Teaching, and Fever hospital respectively. Regarding their gender; all of them were females at Fever hospital also, most of them were female (93.8 and 91.2%) for University and Teaching hospital respectively. Also, the majority of them were married (88.8%, 91.2% and 91.7%) for Benha University, Teaching, and Fever hospitals respectively. In relation to their educational level; more than half (56.2%.58.8% and 75%) of head nurses had Bachelor of nursing at Benha University, Teaching, and Fever hospitals respectively. In additions, the highest percentage (40%) of head nurses had 5-10 years of experience at Benha University hospital and (32.5% and 39.1%) of head nurses had 10-15 years at Benha Teaching and Fever hospitals respectively.

Table (3): Presented coding and categorization of qualitative data obtained from semi -structured interview using open ended questionnaires. It shows that four domains and 15 themes for obstacles were yielded from qualitative data.

Factor analysis for developed instrument.

Table (4): Revealed internal consistency reliability, KMO and Bartlett's test for developed instrument. It shows that the internal consistency reliability determined by calculating the cronbach's alpha for instrument items are .93 also, it shows that KMO measures of sampling adequacy was adequate .76, and Bartlett's test

measures the relationship among variables of the instrument was highly significant .000 to run factor analysis.

Figure (1): Presented scree plot which graphing the components eigenvalues for developed instrument. Application of varimex rotation of using factors of eigenvalues over 1.0 shows five components solution. This appears conceptually congruent since instrument questions were originally developed within 4 domains (table 2)

Table (5): Shows communalities before and after extraction and PCA loading for varimex rotated components matrix. In relation to questions communalities before and after extraction the result showed that the question initial commonalties was 1.00 for all instrument questions, and commonalties after extraction was ≥ .5 for all questions except questions no. 5, 26, 29 = .480, .208, .495 respectively (excluded from the final version of the developed instrument). The average of commonalties for developed instrument questions = 0.88.

Regarding PCA loading for varimex rotated components matrix. It shows the following; Component 1, defined by 13 questions, was labeled as obstacles related to working conditions. Component 2, defined by 11 questions, was labeled as obstacles related to head nurses. Component 3, defined by 12 questions, was labeled as obstacles related to hospital mangers at middle and top levels. Component 4, defined by 10 questions, was labeled as obstacles related to staff nurses. An examination of all question content revealed that all questions related to its title domain. Component 5: not defined and excluded as it includes only three questions two of them had communalities after extraction < 0.5. (no: 5,29). It also, shows that all extracted components with eigenvalue >1.0 and accounted variances ≥ 40%.

Table (6): Illustrates obstacles encounters head nurses' role excellence instrument (final version). It shows that the newly developed instrument retained four components and 46 questions.

Table (1): Distribution of head nurses regarding their personal characteristics (Sample 1). (N= 104).

Personal Characteristics	No	%
Age		
<30	25	24
30-40	42	40.5
40-	37	35.5
Gender		
Male	10	9.5
Female	94	90.5
Marital status		
Married	92	88.5
Unmarried	12	11.5
Educational level		
Diploma	13	12.5
Bachelor of nursing	55	53
Master	26	25
Doctorate	10	9.5
Year of experience		
<5	11	10.5
5- <10	26	25
10- <15	27	26
≥ 15	40	38.5

Table (2): Distribution of head nurses regarding their personal characteristics (Sample 2). (N= 160).

Personal characteristic	Benha University Hospital n=80		Benha Teaching Hospital n=34		Benha Fever Hospital n= 46	
	No	%	No	%	No	%
Age						
<30	14	17.5	4	11.6	3	6.5
30-40	41	51.2	23	67.8	27	58.7
40-	25	31.3	7	20.6	16	34.8
Gender						
Male	5	6.2	3	8.8	0	0
Female	75	93.8	31	91.2	46	100
Marital status						
Married	71	88.8	31	91.2	42	91.7
Unmarried	9	11.2	3	8.8	4	8.3
Educational level						
Diploma	11	13.8	2	5.9	3	6.5
Bachelor of nursing	45	56.2	20	58.8	36	75
Master	13	16.2	7	20.6	5	10.7
Doctorate	11	13.8	5	14.7	4	8.3
Year of experience						
<5	9	11.2	4	11.6	3	6.5
5- <10	32	40	10	29.4	14	30.5
10- <15	25	31.2	11	32.5	18	39.1
≥ 15	14	17.6	9	26.5	11	23.9

Table (3) The main domains and themes were extracted from semi-structured interview notes and open- ended questionnaires.

Qualitative data coding and categorization	
Domains	**Themes**
1- Obstacles related to working conditions	**Examples of head nurses words:** - Unclear performance standards in many areas and absence of driving evidence based practice encounter my ability to act. - Inadequate equipment and supplies is the most concern I face. In many times I felling distress and annoyance resulting from an inability to change or achieve something and the gap between what I have learned and what I found. - All ideas require resources to become facts. Also, folded information and Poor information management is considered obstacles to achieve my best performance. - Absence of customers/ patient involvement mechanism, less interested hospital to be competitor organization or accredited one is problem I sometime face - -Improper relationship with other organizations, stakeholders and labor market are problems I face and reflected on my performance.
	Themes extracted 1. Unclear performance polices, standards and responsibilities 2. Inadequate equipments and supplies 3. Less patient involvement. 4. Improper information management system. 5. Unsafe working conditions (physical, psychological)
2- Obstacles related to head nurses	**Examples of head nurses words:** - Many head nurses have improper managerial skills as planning, supervision, directing, time management, problem solving and decision making skills ……ect. and this actually reflected in role excellence. - Also, technical skills sometimes consider obstacles. For example head nurses didn't have enough skills in handling direct pt care, computer and technology literacy …ect - Some head nurses resist change, don't give importance to customer satisfaction, and less committed to hospital improvement. - No one can deny that human skills are important concern in our role excellence. Many obstacle can arise when head nurse lack ability to listen, build good relations, work in team, honesty, trustworthiness,…ect. - I consider lack of my experiences in budgeting and financial issues is major concern affect my performance. And from my point of view may of my colleagues in hospital have the same problem.
	Themes extracted 1. Lack managerial, conceptual, practical, and human skills. 2. Resistance for change and less commitment to hospital improvement. 3. Lack budgeting and financial issues experiences
3- Obstacles related nurse mangers at middle and top levels	**Examples of head nurses words:** - Many times I suffers from "my middle and top nurse managers don't delegate managerial duties" and I feels that they didn't trust my experiences or they didn't respect me and this encounter my role best practicing. - To be better in doing my role I need empowerments, motivation, adequate communication, orientation and support to staff development programs from my middle and top seniors. But I lack this. - Lack of hospital nurse managers' abilities to mange human and nonhuman resources and less of their commitment to hospital development usually reflected in my performance.
	Themes extracted 1. Low respect, support from hospital senior managers. 2. Improper human and non human resources management 3. Less empowerment to head nurses.
4- Obstacles related to staff nurses	**Examples of head nurses words:** - Staff nurses in many times are the obstacles I face. They resist change, lack sense of responsibility and accountability and many of them Lack trust in their ability. - Shortage of staff and staffing problem are main problem I face. - Nurses in many times lack technical skills, personal skills, and cognitive skills. For example: nurses didn't have enough skills in documentation. - Computer and technology literacy, inability to work in team, poor problem solving and critical thinking skills is problem. - Many of nurses are unable to understand and follow quality, and safety standards and this reflected in our role performance.
	Themes extracted 1. Resistance for change 2.Lack conceptual, practical, and human skills. 3.Shortage of nursing staff. 4.Lack sense of responsibility and accountability.

Factor analysis for obstacles encounter head nurse role excellence instrument

Table (4): Internal consistency reliability, KMO and Bartlett's test for obstacles encounter head nurse' role excellence instrument

No. of items	Internal consistency reliability	KMO	Bartlett's Test of Sphericity		
			Approx. Chi-Square	Df	Sig
50	.93	.766	11762.139	1860	.000

Figure (1): Scree plot of components eigenvalues for obstacles encounter head nurse role excellence instrument

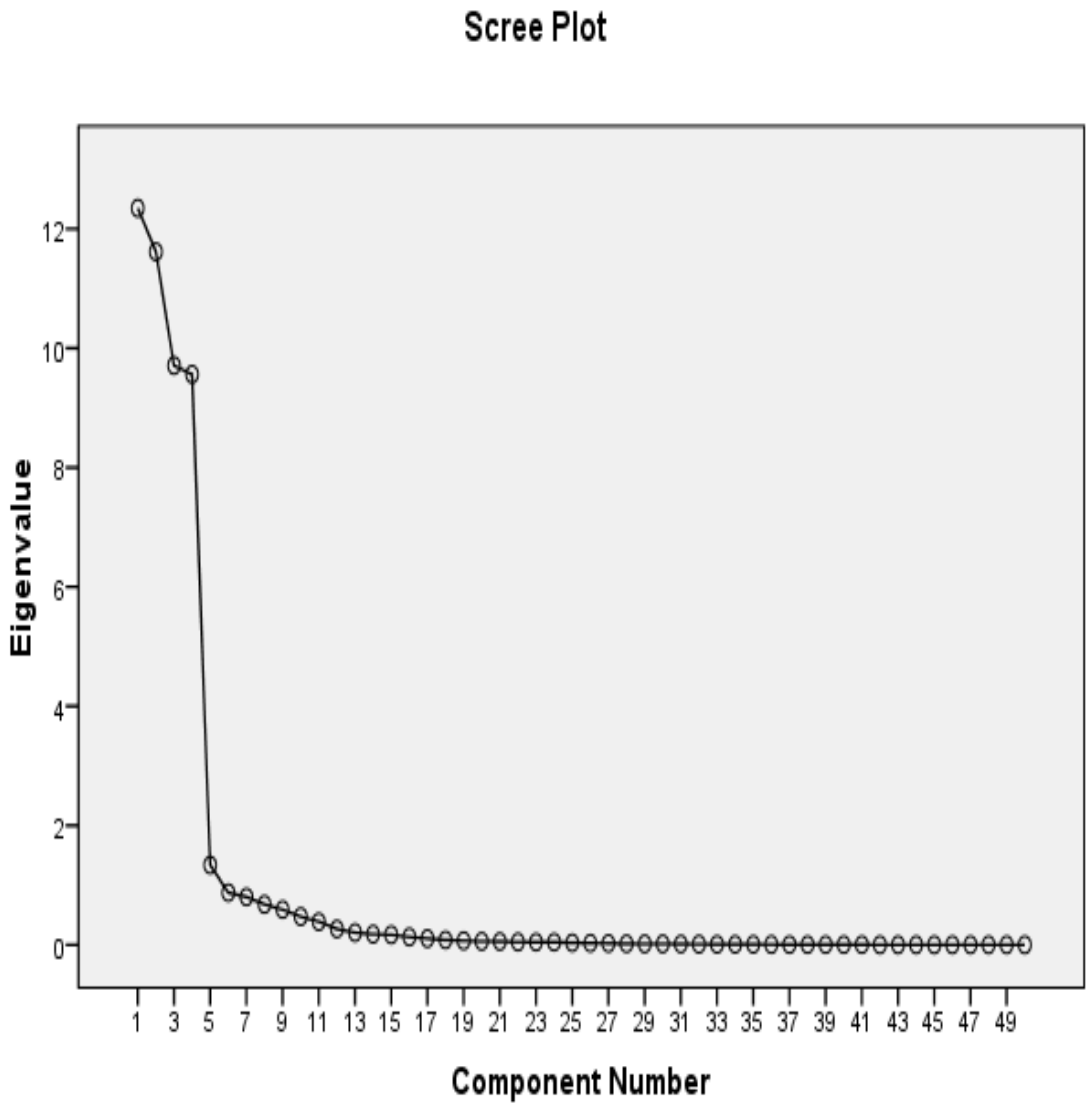

Table (5): Communalities before, after extraction and PCA loading for varimex rotated factor matrix for obstacles encounters head nurse' role excellence instrument

Rotated Component Matrix[a]						Communalities before extraction (Initial)	Communalities after extraction	Eigen value and % of Variance
	Component (factors)							
Question/ Item no.	1	2	3	4	5			
Q.38.	.989					1.000	.982	Eigen value= 12.347 % of Variance= 24.694
Q.43.	.989					1.000	.982	
Q.45.	.989					1.000	.981	
Q.46.	.982					1.000	.970	
Q.49.	.982					1.000	.970	
Q.47.	.976					1.000	.960	
Q.50.	.967					1.000	.938	
Q.40.	.965					1.000	.936	
Q.39.	.960					1.000	.927	
Q.41.	.951					1.000	.931	
Q.42.	.950					1.000	.932	
Q.48.	.950					1.000	.932	
Q.44.	.950					1.000	.932	
Q.28.		.983				1.000	.968	Eigen value= 11.617 % of Variance= 23.233
Q.34.		.982				1.000	.941	
Q.35.		.979				1.000	.960	
Q.31.		.979				1.000	.961	
Q.37.		.979				1.000	.962	
Q.33.		.972				1.000	.947	
Q.32.		.968				1.000	.941	
Q.27.		.968				1.000	.939	
Q.36.		.967				1.000	.939	
Q.25.		.966				1.000	.939	
Q.30.		.963				1.000	.931	
Q.26.		.428				1.000	.208	
Q.9.			.960			1.000	.937	Eigen value= 9.708 % of Variance= 19.416
Q.2.			.958			1.000	.931	
Q.3.			.955			1.000	.927	
Q.6.			.943			1.000	.906	
Q.7.			.937			1.000	.880	
Q.8.			.937			1.000	.883	
Q.1.			.926			1.000	.860	
Q.4.			.919			1.000	848	
Q.12.			.917			1.000	.843	
Q.13.			.915			1.000	.841	
Q.11.			.915			1.000	.846	
Q.10.			.892			1.000	.809	
Q.18.				.981		1.000	.963	Eigen value= 9.562 % of Variance= 19.124
Q.15.				.981		1.000	.963	
Q.19.				.979		1.000	.958	
Q.16.				.979		1.000	.958	
Q.23.				.974		1.000	.950	
Q.21.				.973		1.000	.949	
Q.24.				.973		1.000	.939	
Q.20.				.969		1.000	.939	
Q.14.				.967		1.000	.937	
Q.22.				.916		1.000	.846	
Q.29.					.714	1.000	.495	Eigen value= 1.338 % of Variance= 2.676
Q.5.					-.638-	1.000	.480	
Q.17.					.519	1.000	.536	

Average of commonalities = 0.88
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 5 iterations

Table (6) Obstacles encounters head nurses' role excellence instrument (final version)

Items	Always	Usually	Often	Some time	Rarely
As a head nurse when you acting your role do you face the following:					
I. Obstacles related to working conditions:					
1. Q.38. Unclear performance standards.					
2. Q.43. Inadequate equipments and supplies.					
3. Q.45. Unsafe working condition.					
4. Q.46. Lack of team work and collaboration					
5. Q.49 Increased workplace stress					
6. Q.47. Increased workplace conflict.					
7. Q.50. Improper relationship of hospital with other organizations, stakeholders and labor market					
8. Q.40. Absence of patient involvement mechanism.					
9. Q.39. Absence of driving evidence based practice.					
10. Q.41. Lack of access to information technology.					
11. Q.42. Poor information management.					
12. Q.48. Challenges associated with culturally diverse workplace.					
13. Q.44. Lack of places or time for fun, relax, and social interaction.					
II. Obstacles related to head nurses:					
Lack of my…….					
14. Q.28. cognitive skills (e.g. problem solving, decision making, critical thinking, …….ect)					
15. Q.34. technical skills (e.g. technology use, apply specialize procedure, and technique required for work done)					
16. Q.35. personal skills (e.g. listening skills, communication, trust,…….ect)					
Lack of my managerial skills:					
17. Q.31. intelligence planning.					
18. Q.37. time planning.					
19. Q.33. delegation of role and functions.					
20. Q.32. organization coordination.					
21. Q.27. controlling.					
22. Q.36. resources management.					
23. Q.25. financial management.					
24. Q.30 disaster, and change management.					
III. Obstacles related to nurse managers at middle and top levels:					
Lack of nurse managers……					
25. Q.9. empowerment to me.					
26. Q.2. respect to me.					
27. Q.3. motivation or recognition for my achievements.					
28. Q.6. delegation of tasks to me.					
29. Q.7. using of upward communication with me.					
30. Q.8. using mechanism for dealing with my recommendation and complains.					
31. Q.1. providing opportunities for participation in decision making when results will affect me.					
32. Q.4. support to me.					
33. Q.12. interest in staff development programs.					
34. Q.13. providing orientation to my role.					
35. Q.11. skills for hospital's non human resources management.					
36. Q.10. Commitment to hospital improvement.					
IV. Obstacles related to staff nurses:					
Lack of staff nurses……					
37. Q.18. sense of responsibility and accountability.					
38. Q.15. cognitive skills (e.g. problem solving and critical thinking skills, ect).					
39. Q.19. technical skills (e.g. documentation, apply specialize procedure, and technique required for work done)					
40. Q.16. ability to follow performance standards.					
41. Q.23. experience for dealing with new technology.					
42. Q.21. trust in their ability (self efficacy).					
43. Q.24. ability for dealing with challenges associated with culturally diverse workplace.					

44. Q.20. interest in patient's satisfaction.					
45. Q.14. ability for adapting with change.					
46. Q.22. commitment to hospital development.					

Discussion

The context in which health care is delivered is complex, necessitating fundamental system changes in order to achieve high-quality results and a fulfilling work environment (Ghiasipour et al., 2017 & Moghaddam et al., 2019). Head nurses live with this complexity, and it is a routine experience for them. They work at the front line to make sure patient care is provided in safely way through high quality practice. They face many problems when they try to produce their best performance (Weis and Tappen 2015 & Adatara et al., 2018).

The problem addressed in this study was the absence of instrument designed specifically for measuring obstacles encounter head nurse' role excellence. Results of the analysis of head nurses' words in obstacles encounter head nurses in role excellence' open- ended questionnaire and notes were took during interviews yielded four domains for these obstacles.

First domain refers to working conditions related obstacles: main themes under this domain were; unclear performance standards and responsibilities, inadequate equipments and supplies, less patient involvement, improper information management system, and unsafe working conditions. This result was agreed by Naidoo (2017) and Adatara et al. (2021) who ranked obstacles related to head nurses work life as the most important one. They reported unclear performance polices and standards and folded information as a priority complain for many head nurses. While, Jusufi and Jaha (2017) ranked customer involvement as the lowest important one of organizational obstacles for head nurses. From researchers' point of view unclear performance standards, inadequate equipments and supplies and unsafe working conditions are the main problems head nurses face during their daily work and encounter them when they try to apply high performance standards.

Second domain refers to head nurses' related obstacles: main themes under this domain are; lack of head nurses managerial, conceptual, practical, and human skills, their resistance for change and less commitment to hospital improvement, and lack of their experiences about budgeting and financial issues. The result of the study is supported by Gunawan et al (2018) and Hughe (2021) who were relates challenges and obstacles face head nurses to their leadership and management approach. Also Shirey et al., (2013) described their abilities as the most influenced power toward their excellence. Moreover, Bai and Liu (2017) and Saleh et al. (2017) stated that many head nurses lack financial experiences and training and they face many problems in dealing with its issues.

From researchers' point of view head nurses' managerial, conceptual, and human skills are very important for their excellence performance and when they lack them they become unable to manage their staff or units. On the other hand, this result inconsistent with Livne etal., (2017) and Hughe (2021) who stated that head nurses aren't usually resists change and many of them act for hospitals improvements. Also, Abdul Fattah (2014) and Miri et al. (2014) reported that practical skills for head nurses aren't apriority for their excellence.

Third domain refers to hospital nurse manager at middle and top levels related obstacles: main themes under this domain are; lack respect or support, less empowerment to head nurses, and improper human and non human resources management. These results are consistent with Weiss and Tappen (2015), Milinkovic and Kovacevic (2020) and Hughe (2021) who were joined improved and high head nurses' performance to the way their senior managers act and how they treat them. They focused that when head nurses obtained respect, support and empowerment their willingness to act is increase and they become more committed to their organization. Also, Saleh (2017), Orgev and Demir (2019) and Onete (2020) mentioned poor human and non human resources management by top management as the main obstacle faced head nurses and reflected directly on their action.

In the same respect Matlakala et al, (2014) and Moghaddam (2019) emphasized on the role of senior managers in support training and development of head nurses to help them overcome today health care challenges. From researchers' point of view the role of top managers in supporting and empowering head nurses in health care organization is pivotal. Head nurses need this support to be able to manage their staff and units and when they deprived this it become impossible for them to act their role.

Fourth domain refers to staff nurses' related obstacles: main themes under this domain are; staff nurses' resistance for change, lack of their conceptual, practical, and human skills, shortage of nursing staff and lack of their sense of responsibility and accountability. This results supported by Abdul Fattah (2014) who stated that study participants reported nursing staff problems as an important one faced head nurses' better performance especially their shortage and lack of skills. In the same respect Saleh, (2017) mentioned resistance of nurses for change as a problem faced head nurses in many hospitals. From researchers' point of view when head nurse act with competent staff that are able to comprehend and apply performance policies and procedures this will be reflected in his/her management style and role excellence.

Content validity of the developed instrument:

In this study the validity results of instrument validity carried out by 30 experts panel members proved that the main domains and themes were yielded from the analysis of respondent obstacles encounter head nurses in role excellence' interviewed open - ended questionnaires are valid to be basic for the developed instrument and the content validity established through items/ questions content validity index (I-CVI) was > 0.89 for all questions which were retained in the developed instrument. This is agreed with Yusoff (2019) and Sirvent et al. (2022) who mentioned that an I-CVI in methodological research generated by more than nine rater panel ≥ 0.78 is considered fair, while 0.93 and above is considered excellent. The (CVII) was .92. According to Tabachnick (2014) and Lau (2018) the CVII above 0.90 is excellent.

Regarding the reliability of the instrument, the internal consistency reliability was determined by calculating the Cronbach's alpha for instrument questions. In the current study, Cronbach's alpha coefficient was calculated to be 93%. This is consistent with Slavec and Drnove (2012), and Tabachnick et al. (2014) who stated that the internal consistency reliability measured by Cronbach's

alpha coefficient calculation result is accepted when it is ≥ 75% and considered excellent when it is more.

Factors (components) analysis

In the current study Kaiser-Meyer-Olkin (KMO) was .76, and Bartlett's test was highly significant. This result was considered accepted to run factor/ component analysis according to Slavec and Drnove (2012). In relation to construct validity which was established through EFA. In this study the initial commonalties for all questions were 1.0 and commonalties after extraction for each question were ≥ 0.5 except three questions which were excluded within the five component. Moreover, the average of commonalties for all questions was 0.88. According to Brown (2015) the average of commonalties after extraction calculated for all questions should not be below .50 and the initial commonalties for all questions should be 1.0 and commonalties after extraction for each question probably should be ≥ 0.5 to be retained in the final version and questions below 0.5 should be excluded.

In this study, varimex rotation extracted five components with eigenvalue >1.0 and accounted variances ≥ 40% and at least three questions per component. This result is supported by Brown (2015) and Unver et al. (2017) who stated that the accepted criteria to determine how many components to retain in instrument, is the retaining of components with eigenvalue >1.0 and accounted variance ≥ 40%. Moreover, Tabachnick and Fidell (2014) added that, at least three questions per component should be loaded to be considered within the final version. one component was excluded because it contained only three items, two of them were with commonalties below 0.5.

Therefore, the newly developed instrument for obstacles encounter head nurses' role excellence retained four components and 46 questions can be considered to have accepted construct validity.

Conclusion:

The study revealed that developed instrument has high score for content validity index deducted that sample of items for the construct being measured was appropriate, Cronbach's alpha coefficient was calculated to be good, KMO was high, Bartlett's test was highly significant, and varimex rotation extracted four components with accepted eigenvalue and appropriate accounted variances. Therefore; the final version of instrument contains four domains with 46 items is considered to be valid and reliable based on statistical analysis categorized as follows: obstacles related to working conditions, obstacles related to head nurses, obstacles related to nurse managers at middle and top levels and obstacles related to staff nurses.

Recommendations:

based on study finding it recommends that:

- Using the developed instrument in conducting assessment for obstacles encounters head nurses' role excellence in different healthcare setting.
- Further research is needed to:
- Examine obstacles encounter head nurses from hospital managers and staff nurses' point of view.
- Develop strategy to deal with these obstacles.
- Test the reliability of the developed instrument with other head nurses at different time and settings.

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