Effect of Authentic Leadership Training Program for Head Nurses on Nurses Innovative Work Behaviors at Minia University Hospitals

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Abstract

Background: Authentic leadership has the power to affect nurses' behavior and job outcomes. Head nurses can utilize authentic leadership style to favorably influence nurses, increasing their creativity and innovative behaviors. **Aim of the study:** is to investigate the effect of authentic leadership training program for head nurses on nurses' innovative work behaviors at Minia University Hospitals **Research design:** A quasi- experimental research design was utilized in this study. **Sample:** The study subjects involved two groups, all head nurses worked in Minia University Hospitals (total no 81), and representative sample of nurses in Minia University Hospitals (total no 315). **Three tools were used: Tool (I)** Authentic leadership skills of head nurses, **Tool (II):** Head nurse knowledge about authentic leadership, and **Tool (III):** Innovative work behaviors for nurses. **Results**: there were (100%) of head nurses had high level of authentic leadership knowledge in immediate post-program and (96.5%) in post 3 months than pre-program (0.0%); also (65.4%) of them had high level of authentic leadership skills in immediate post-program and (63%) in post 3 months with statistically significant differences for both. Also, there were (53%) of nurses had high level of innovative work behaviors in immediate post-program and (40.6%) of them in post 3 months with statistically significant differences. **Conclusions**: Authentic leadership educational program have a positive significant effect on head nurses authentic leadership knowledge and skills and nurses innovative work behaviors. **Recommendations**: Provide head nurses periodic workshops to improve their authentic leadership skills to improve nurses innovative and empowered skills.

Keywords: Authentic leadership, Educational program, Head nurses, Innovative work behaviors, Nurses

Introduction:

Globally, leaders play a critical role in health care services and provide an environment that promotes individual contributions to the organization's work **(Abd Elmawla et al., 2020)**. Nurse leaders are critical in fostering supportive environment for everyday professional practice, as well as ability to adopt the innovations that benefit nurses, patients, and organizations **(Haskins & Roets, 2022)**. Authentic leadership has been established as a key component of effective leadership, which is required to foster innovative work settings **(Bai et al., 2022)**.

The development of head nurses' leadership style can increase hospital productivity by potentiating, coordinating, and articulating nursing tasks for delivery of high-quality patient care, keeping staff informed about evidence-based practices, advocating for health-care reform, promoting social relationships, and encouraging participation in decision-making **(Hassan et al. 2022)**. In addition, staff nurses can achieve organizational goals if their work environments are arranged in a way that they have access to information and allow them to be more innovative in their discovery and growth **(Elewa & El Banan, 2022).**

There are many different leadership styles, but none of them are appropriate for every situation or environment **(Alilyyani**, **2022)**. Authentic leadership is a leadership style that confirms legitimacy of the leaders by fostering self-awareness, internalized moral perspective, balanced information processing, and relational transparency through honest leadership that emphasizes building relationships with followers and enhances positive psychological capacities and ethical climate **(Nakamura et al., 2023)**.

Authentic leadership style includes four dimensions: self-awareness, balanced processing, relational transparency, and internalized moral perspective **(Ahmed, 2023)**. The ability to perceive and appreciate one's own talents and weaknesses is known as self-awareness **(Mohamed & Hassan, 2022).** Knowing ones-self entails being aware of one's own thoughts, values, and motives also, entails being aware of one's own emotions and contradicting internal features **(Knox et al., 2023)**.

Balanced processing refers to head nurse's ability to objectively analyze external and self-referential facts and data while considering others' opinions before making decision. It means they don't dismiss facts and objectively assess all relevant evidence before making decision, letting them to avoid bias in their perceptions caused by self-defense or self-protection **(Aboelenein & Mostafa, 2023)**.

Relational transparency is an active process of self-disclosure and the development of relationship and trust with followers, which involves being honest about oneself and communicating both positive and negative aspects as well as being open and honest in sharing information about one's thoughts and feelings without any hidden agendas **(Elassy, 2023)**.

Moral perspective entails an integrate form of self-regulation that involves adhering to moral and ethical standards in facing of possible group, social, or organizational pressure. It results in transparent and ethical behaviors that aim at serving the general good and odds with the leader's personal interests **(Hassan et al., 2023)**.

Moreover, authentic leadership program can help participants to express themselves in the world with dignity, humility, honesty, and integrity. In addition, it supports the head nurses in increasing nurses' invention to inspire self-discovery, which allows for the development of autonomy also encouraging the growth and nurturing of innovation and uniqueness **(Aboelenein& Mostafa, 2023)**.

Innovation refers to the creation of new and valuable product, service, process, management, business model, and competitive strategies. The intentional conduct of individual for implementing new ideas to their given job function is defined as innovative work behavior **(Srirahayu, 2023)**.

Innovative behavior helps organizations to generate new ideas and offer innovative products and methods **(Alt, et al., 2023)**. Also, authentic leaders have a critical role in supporting innovation among them in the health-care sectors. Thus staff nurses 'innovation can be encouraged if their leaders meet job needs, respond to inventive goal advancement, and reward them **(Gao, et al., 2022)**. Nurses need to be innovative enough to manage and solve obstacles such as securing funds, obtaining supplies, dealing with various patients and medications and medical equipment which in turn lead to successful organization and economic growth **(Semedo & Coelho 2017)**.

Ideally, authentic leadership is an emerging style and need appropriate strategies to facilitate its practice through training programs. However, the implementation of authentic leadership gives a positive value for nursing profession and healthcare services. Head nurses must create workplace that is optimal in the maintenance of staff nurses by developing healthcare practice conditions to promote their resilience and utilizing best innovative ideas and behaviors for self or organization development **(Godsey et al., 2020)**.

Significance of the Study

Nowadays, the leadership behaviors of nursing leaders and organizational climate have a critical part in improving the organization. Inadequacies of seasoned leadership styles and unethical leadership practices have resulted in many negative consequences for individuals and organizations. Authentic leadership is a character-driven leadership model equipped with morality, integrity, and authenticity. Moreover, encouraging innovative work behavior among nurses has been an important development direction for healthcare organizations **(Ahmed, 2019)**.

Indeed, studies have provided evidence for the relationship between authentic leadership and innovation. **Zhou et al., (2018)** tested the relationship between authentic leadership and employee innovation, taking into account the mediating effect of employees' positive emotions. These results showed that leaders who are perceived as more authentic are able to evoke positive emotions (courage and enthusiasm), which in turn leads to proposing innovative solutions at work.

Müceldili et al., (2013) showed a positive relation between authentic leadership and employee innovative behavior, which was mediated by employee creativity. Other studies offered indirect evidence, showing that perceived authentic leadership was related to employee creativity or an innovative group climate and information sharing in teams. Studies additionally showed that a positive relationship between authentic leadership and employee creativity is mediated by employee psychological resources and attitudes at work.

Therefore, it was felt necessary to examine the effect of authentic leadership on innovative work behaviors of nurses on Minia University Hospitals to determine the level of authentic leadership among head nurses and determine its effect on nurses innovative work behaviors for more improvement of nursing profession and quality of care.

Aim of the Study

The aim of the current study is to investigate the effect of authentic leadership training program for head nurses on nurses' innovative work behaviors at Minia University Hospitals.

Research Hypotheses:
1. Head nurses' authentic leadership knowledge and skills will be higher after implementing training program than before at Minia University Hospitals.
2. Nurses' Innovative work behaviors will be higher after implementing authentic leadership training program for head nurses at Minia University Hospitals.

Subjects and methods:
Research Design:

A quasi- experimental research design was utilized in this study.

Setting:

The study was conducted at Five Minia University Hospitals. These hospitals named as: Minia Emergency University Hospital; Renal and Urology University Hospital; Liver University Hospital; Cardio Thoracic University Hospital; and Pediatric and Gynecology University Hospital.

Sample:

The study subjects involved two groups as follows:

Group one: All head nurses who worked in Minia University Hospitals (total no 81 head nurse) at the time of data collection.

Group two: A representative sample (30%) of nurses at the time of collection in the span of control of those head nurses in Minia University Hospitals by using simple random sample (total no 315 nurse).

Tools of Data Collection:

Data were be collected through the utilization of three tools as follows:

Tool (I): Self-Administered Questionnaire: It included two parts

Part I: Socio-demographic data: It was designed by the researcher, this part was used to collect data related to personal characteristics data for head nurses such as (age, gender, marital status, position, years of experience, salary, residence, educational qualification, and department).

Part II: Authentic Leadership skills Questionnaire: The questionnaire developed by **Northouse (1999)** to assess head nurses' authentic leadership skills. The

questionnaire consisted of sixteen items categorized into four subscales namely; self-awareness, internalized moral perspective, balanced processing, and relational transparency, with four items for each subscale. Responses were rated on five point likert scale ranging from (1) = strongly disagree to (5) =strongly agree. **Scoring system** of this part ranged from (16) to (80) and was distributed as follows: Good level of authentic leadership75% and more (≥59), fair level of authentic leadership 50-74 % (38-58), and poor level of authentic leadership less than 50% (< 38).

Tool II: Head nurse Knowledge about authentic leadership:

This tool was developed by the researcher to assess head nurses knowledge about authentic leadership based on the literature as: **Baron and Parent (2015); Alilyyani, et al., (2018); Onyalla, (2018); Cotter-Lockard (2018); Zhang, et al., (2018); Moore (2019); Vermeulen, and Scheepers (2020); and Purwanto, et al., (2021).** This tool included fifty one questions and divided into two parts, first part was true and false questions which included (thirty five) questions, second part was multiple choose questions which included (sixteen) questions. This tool grouped under eight dimensions as follows: definition of authentic leadership (11 questions), characteristics of authentic leadership (12 questions), characteristics of authentic leaders (7 questions), components of authentic leadership (7 questions), perspectives of authentic leadership (3 questions), importance of authentic leadership (5 questions), approaches of authentic leadership (3 questions), and models (3 questions). This tool was filled from head nurses. Response was rated as follows (0=incorrect, 1=correct); (with a minimum score was 0 and a maximum score was 51). **Scoring syste**m of this tool was be distributed as follows: Good knowledge of authentic leadership 75% and more (≥35), fair knowledge of authentic leadership 50-74 % (18-34), and poor knowledge of authentic leadership less than 50% (< 18).

Tool III: Self-Administered Questionnaire for nurses: It included two parts

Part I: Socio-demographic data: It was designed by the researcher, this part was used to collect data related to personnel characteristics data for nurses such as (age, gender, marital status, position, years of experience, salary, residence, educational qualification, and department).

Part II: Innovative work behaviors scale (IWBS): This part was developed by the researcher to assess nurses' innovative work behaviors based on the work of **De Jong (2007), Janssen (2000), Kleysen and Street (2001), and Messmann and Mulder (2012)**. It was included forty two items and was divided into five dimensions as: Opportunity exploration (4 items); idea generation (12 items); idea championing (11 items); idea implementation (7 items); and recognizing and support (8 items). Responses were rated on five point likert scale ranging from (1) = strongly disagree, to (5) = strongly agree. **Scoring system** of this part ranged from (42) to (210) and was distributed as follows: Good level of innovative work behaviors 75 % and more (≥155), fair level of innovative work behaviors 50-74 % (99-154), and poor level of innovative work behaviors less than 50% (< 99).

Validity and reliability:

The tools were tested for the validity by a jury of five experts in the field of Nursing Administration. Each expert panel was asked to examine the instruments for content coverage, clarity, wording, length, format, and overall appearance. Also, the necessary modification was done by the jury panel. To establish reliability, the tools were tested for internal consistency by using Cronbach's alpha test to check the stability of the internal consistency of the tools, and alpha was for tool I = 0.939, tool II = 0.727 and tool III= 0.937.

Pilot Study:

A pilot study was done on 10% (8 head nurses, and 32 nurses) of participants. They were selected randomly from the study setting in order to investigate and ensure the feasibility, objectivity, applicability, clarity, and adequacy of the study tools and to estimate the time needed for filling the study tools. In the light of the findings of the pilot study, no changes occurred in the tools and the tools were put in their final form; the pilot study was included in the actual study subjects.

Data collection procedure: The study was conducted in six phases: preparation, assessment, planning, implementation, evaluation and follow up phase. It was lasted from the beginning of May (2021) to end of November (2022).

Phase 1: Preparation Phase:

In this phase: Written Approval was taken from Ethical Committee in the Faculty of Nursing, Minia University. Also, Approval to conduct the study was obtained from Dean of the Faculty of Nursing, Minia University.

A review of the related literature which covering various aspects of the problem and study variables was done, using different books, journals and web sites, to get acquainted with the research problem and to implement the study. Tool (I) Authentic Leadership Questionnaire was adopted and tool (II) Head nurse knowledge about authentic leadership and tool (III) Innovative work behaviors scale were developed based on related literatures.

Translation of tool (I), tool (II) and tool (III) was done. Testing the validity of three tools (I, II, and III) from the jury; and necessary modification were be done. Tools of the study were tested for reliability and its internal consistency.

Phase 2: Assessment Phase:

In this phase: Permissions were obtained from directors of the five hospitals (Minia university Hospitals). Oral informed consents were obtained from the head nurses and the nurses (Minia university Hospitals).

Pre-test was done for head nurses in which they assessed by using tool I (Authentic Leadership Questionnaire) and tool II (Head nurse knowledge about authentic leadership skills). Nurses were assessed for their innovative work behaviors by using tool (III) and this phase was done to collect the base line data before implementing training program.

Phase 3: Planning phase:

In this phase: Developing the program booklet for head nurses about authentic leadership. The program included knowledge about definition of authentic leadership, components, importance, principles, perspectives, characteristics, how to practice authentic leadership and challenges to authentic leadership development.

The timetable of the program was developed based on head nurses work time schedules. The training

environment was developed in which the study was conducted, and all needed resources as (conference rooms in the hospital and data show) were revised.

Phase 4: Implementing phase:

In this phase: implementation of authentic leadership program was conducted in the available rooms at Minia University Hospitals. The training program was consisted of ten sessions. One introductory session, eight sessions to develop head nurses' authentic leadership and one conclusion session; each session was taken about two hours.

The researcher described the aim of the program to the participants of head nurses. The researcher distributed the handout about authentic leadership in the beginning of the program.

In the implementation of authentic leadership program; there were different teaching methods used by the researcher in small groups with the head nurses. The training program was lasted for six months.

Phase 5: Evaluation Phase:

In this phase; head nurses were assessed by using tool I and tool II. And nurses were assessed for their innovative work behaviors by using tool (III).

Phase 6: Follow up Phase

In this phase; head nurses were assessed by using tool I and tool II. And nurses were assessed for their innovative work behaviors by using tool (III).

Administrative design:

An official approval were granted from the Dean of Faculty of Nursing at Minia University and directors of Minia university hospitals to carry out the study. This approval was included a brief explanation of the objectives of the study. The research idea was approved by the Nursing Faculty's Ethics Committee.

Ethical considerations:

After explaining the significance, nature, and purpose of the study to the head nurses and nurses who are willing to participate in it, the study is given the go-ahead officially. All participants have the right to decline to participate and/or withdraw from it at any time without giving a reason, privacy was taken into account during the collection of data, and no health risks were present. Participants were given the assurance that all of their information was kept in the strictest confidence, and anonymity was also guaranteed by giving each participant a number rather than their name to preserve their privacy.

Statistical design

Data were analyzed using the statistical package for social science (SPSS) version 20. Numerical data were expressed as mean and SD. Quantitative data were expressed as frequency and percentage. For quantitative data and comparison between variables, there were number of tests used such as ANOVA test, Cochran's Q test, a chi-squared test ($\chi2$) and Kruskal –Wallis test. Relations between different numerical variables were tested using Pearson correlation. Probability (p-value) less than 0.05 was considered significant and less than 0.001 was considered highly significant.

Results:

Table (1): Distribution of the studied staff nurses according to their socio-demographic data:

Socio-demographic data	Head nurses (n= 81)		Nurses (n= 315)	
	No.	%	No.	%
Age / years				
• 20 - < 25	0	0.0%	77	24.4
• 25 - < 30	18	22.2	142	**45.1**
• 30 - < 35	25	**30.9**	67	21.3
• 35 – < 40	24	29.6	9	2.9
• 40- < 45	9	11.1	8	2.5
• > 45	5	6.2	12	3.8
Mean ± SD	34.9 ± 5.7 year		28.8 ± 5.8 year	
Gender				
• Male	50	**61.7**	101	32.1
• Female	31	38.3	214	**67.9**
Years of experience				
• 1 – 5	25	**30.9**	138	**43.8**
• 6 – 10	23	28.4	121	38.4
• 11- 15	21	25.9	28	8.9
• 16- 20	10	12.3	15	4.8
• 21- 25	2	2.5	3	1.0
• 26- 30	0	0.0	10	3.1
Mean ± SD	9.4± 5.5 year		7.5 ± 5.7 year	
Educational qualification				
• Secondary school diploma degree of nursing	0	0.0	63	20.0
• Technical institute degree of nursing	0	0.0	211	**67.0**
• Bachelor degree of nursing	81	**100**	41	13.0
Marital Status				
• Single	8	9.9	102	32.4
• Married	73	**90.1**	201	**63.8**
• Divorced	0	0.0	12	3.8
Hospital				
• Pediatric and Gynecology University Hospital	35	**43.2**	120	**38.1**
• Renal and Urology University Hospital	11	13.6	46	14.6
• Cardio Thoracic University Hospital	13	16.0	57	18.1

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Socio-demographic data	Head nurses (n= 81)		Nurses (n= 315)	
	No.	%	No.	%
• Minia Emergency University Hospital	15	18.5	71	22.5
• Liver University Hospital	7	8.6	21	6.7
Salary				
• < 2000	5	6.2	16	5.1
• 2000 : 3000	8	9.9	148	**47.0**
• 3000 : 4000	27	33.3	126	40.0
• >4000	41	**50.6**	25	7.9
Residence				
• Rural	53	**65.4**	179	**56.8**
• Urban	28	34.6	136	43.2

Table (1) shows that (30.9%) of head nurses aged between 30 to < 35 years old with average mean age (34.9 ± 5.7 year). About gender, there are (61.7%) of them males, and (30.9%) of them have 1 to 5 years of experience. As regard educational qualification all of them (100%) have bachelor degree and for marital status (90.1%) of them married. For the hospital name, there are (43.2%) of them work in Pediatric and Gynecology University Hospital, (50.6%) of them have>4000 salary, and for residence (65.4%) of them lives in rural area.

For nurses' also table (1) shows that (45.1%) of nurses aged between 25 to< 30 years old with average mean age (28.8 ± 5.8 year). About gender, there are (67.9%) of them females, and (43.8%) of them have 1 to 5 years of experience. Regarding educational qualification (67%) of them have technical institute degree of nursing, and for marital status (63.8%) of them are married. For the hospital name, there are (38.1%) of them work in Pediatric and Gynecology University Hospital, (47%) of them have 2000:3000 salary, and for residence (56.8%) of them lives in rural area.

Table (2): Differences between head nurse knowledge scores about authentic leadership in pre, immediate and post three months of implementation (n = 81):

Domains	Pre	Immediate	post	Test of significance	
	Mean ± SD	Mean ± SD	Mean ± SD	One-way	P - value
• Definition of authentic leadership	5.2 ± 1.5	10.3 ± 0.9	9.5 ± 1.3	380.470	0.0001**
• Characteristics of authentic leadership	4.9 ± 1.6	10.4 ± 0.7	9.6 ± 1.1	483.807	0.0001**
• Characteristics of authentic leaders	3.3 ± 1.2	6.6 ± 0.6	6.3 ± 0.8	309.749	0.0001**
• Components of authentic leadership	2.8 ± 1.1	6.4 ± 0.8	5.9 ± 1.0	331.348	0.0001**
• Perspectives of authentic leadership	1.3 ± 0.8	2.9 ± 0.1	2.7 ± 0.3	198.022	0.0001**
• Importance of authentic leadership	2.6 ± 1.0	4.5 ± 1.0	4.0 ± 1.4	58.022	0.0001**
• Approaches of authentic leadership	0.9 ± 1.0	2.5 ± 0.5	2.3 ± 0.7	100.119	0.0001**
• Models of authentic leadership	0.7 ± 0.7	2.7 ± 0.3	2.5 ± 0.5	194.842	0.0001**
Total knowledge about authentic leadership (51)	22.4 ± 4.0	47.1 ± 2.1	43.5 ± 2.9	151.984	0.0001**

One way ANOVA test using for test differences in the means of three or more groups.
Highly statistically significance differences at 0.001

Table (2) shows that head nurses have low mean score in pre-program implementation increase in immediate and post 3 months for all dimensions of authentic leadership knowledge (definition of authentic leadership, characteristics of authentic leadership, characteristics of authentic leaders, components of authentic leadership, perspectives of authentic leadership, importance of authentic leadership, approaches of authentic leadership ,and models of authentic leadership) with highly statistically significance differences between three times of evaluation (P= 0.0001**).

Regarding total mean score of head nurses knowledge about authentic leadership; it was noted that the mean score in pre-program is 22.4 ± 4.0, increases to 47.1 ± 2.1 immediately after implementation, and slightly decreases to 43.5 ± 2.9 from 51scores post three months of implementation with highly statistically significance differences between three times of evaluation (P= 0.0001**).
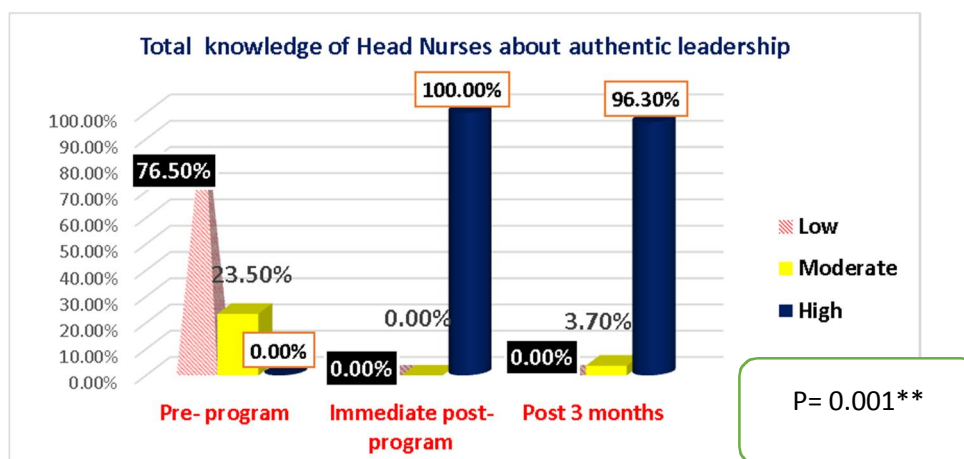

Figure (1): Total knowledge of head nurses about authentic leadership (No=81):

Figure (1) shows that, none of the studied head nurses have high knowledge about authentic leadership in pre-program, increases to 100% immediately after implementation, and slightly decreases to 96.3% post three months of implementation, with highly statistically significance differences between three times of evaluation (P= 0.001**)

Table (3): Differences between head nurse mean about authentic leadership in pre, immediate and post three months of implementation (n = 81):

Domains	Pre	Immediate	post	Test of significance	
	Mean ± SD	Mean ± SD	Mean ± SD	One-way	P – value
• Self-awareness	13.0 ± 2.5	15.5 ± 2.4	14.9 ± 2.4	24.242	0.0001**
• Internalized moral perspective	13.3 ± 2.9	15.6 ± 2.7	15.0 ± 2.4	15.436	0.0001**
• Balanced processing	14.1 ± 3.1	15.9 ± 2.7	15.4 ± 2.4	8.660	0.0001**
• Relational transparency	12.6 ± 2.7	15.8 ± 2.5	14.8 ± 2.3	28.519	0.0001**
Total authentic leadership	53.0 ± 9.7	62.2 ± 9.7	60.1 ± 8.8	21.719	0.0001**

One way ANOVA test using for test differences in the means of three or more groups.
 Highly statistically significance differences at 0.001

Table (3) shows that head nurses have low mean in pre-program implementation increase in immediate, and post 3 months for all dimensions of authentic leadership skills (self-awareness, internalized moral perspective, balanced processing, relational transparency) with highly statistically significance differences between three times of evaluation (P= 0.0001**).

Regarding total mean score level of the head nurses about authentic leadership skills; it was noted that the mean in pre-program is 53.0 ± 9.7 increases to 62.2 ± 9.7 immediately after implementation and slightly decreases to 60.1 ± 8.8 from 16 scores post three months of implementation with highly statistically significance differences between three times of evaluation (P=0.0001**).
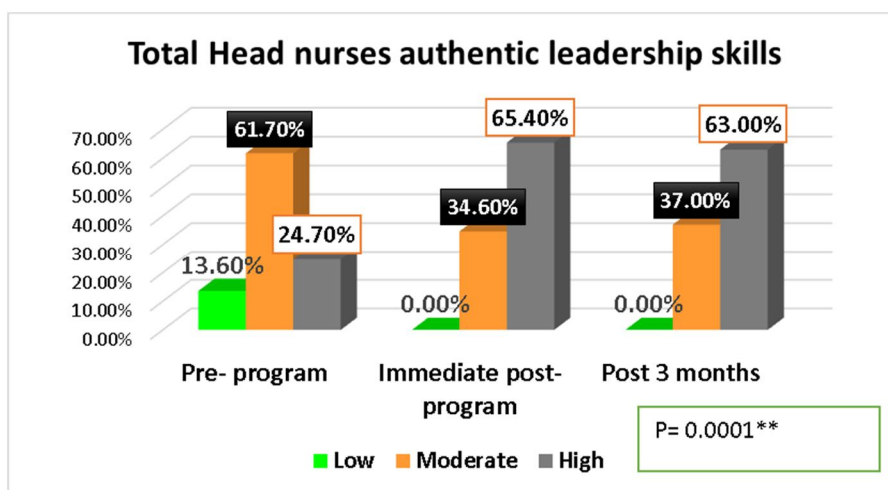

Figure (2): Total authentic leadership of Head nurses during different times of testing (No = 81):

Figure (2) illustrates that 24.70% of the head nurses have low level of authentic leadership skills in pre-program implementation, while there are 65.40% of them have high level in immediately after implementation and 63% have high level post three months of implementation with highly statistically significance differences (P= 0.0001**) .

Table (4): Differences between nurses mean about innovation work behaviors in pre, immediate and post three months of implementation (n = 315):

Domains	Pre	Immediate	post	Test of significance	
	Mean ± SD	Mean ± SD	Mean ± SD	One-way	P – value
• Opportunity exploration	11.9 ± 3.9	14.9 ± 1.8	14.4 ± 2.4	110.125	0.0001**
• Idea generation	37.7 ± 9.5	45.8 ± 5.2	43.4 ± 7.6	93.879	0.0001**
• Idea championing	34.4 ± 8.6	41.8 ± 4.7	39.8 ± 6.7	99.719	0.0001**
• Idea implementation	22.6 ± 6.1	26.3 ± 3.3	25.4 ± 4.5	51.733	0.0001**
• Recognizing and support	24.9 ± 7.2	30.6 ± 3.8	29.6 ± 4.9	96.276	0.0001**
Innovative work behaviors	131.5 ± 30.8	159.4 ± 15.8	152.7 ± 22.2	118.065	0.0001**

One way ANOVA test using for test differences in the means of three or more groups.
Highly statistically significance differences at 0.001

Table (4) shows that nurses have low mean in pre-program implementation increase in immediate and post 3 months for all dimensions of innovative work behaviors (idea exploration, idea generation, idea championing, idea implementation, and recognizing and support) with highly statistically significance differences between three times of evaluation (P= 0.0001**).

Regarding total mean score level of innovative work behaviors; it was noted that the nurses mean in pre-program is 131.5 ± 30.8 increases to 159.4 ± 15.8 immediately after implementation and slightly decreases to 152.7 ± 22.2 from 42 scores post three months of implementation with highly statistically significance differences between three times of evaluation (P=0.0001**).
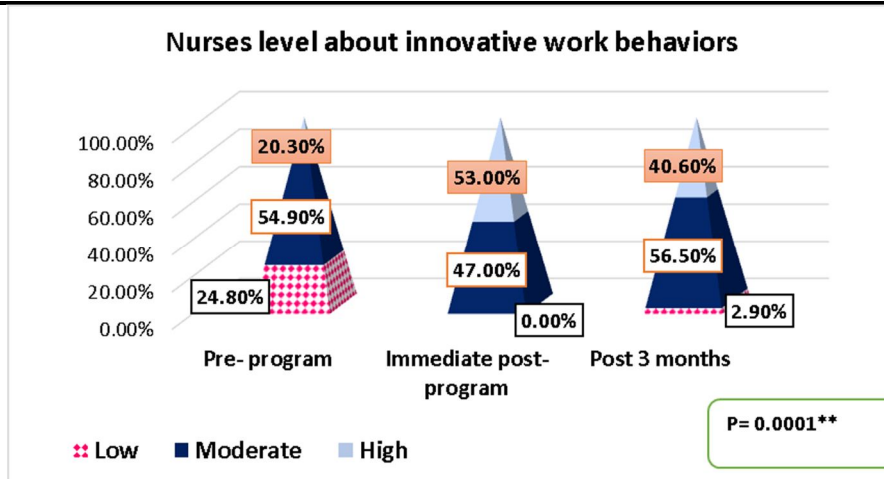
Figure (3): Total nurses' level about innovative work behaviors (No=315):

Figure (3) illustrates that 20.30% of nurses have high level about innovative work behaviors pre-program implementation, increases to 53 % have high level immediately after implementation and slightly decreases to 40.60% have high level post three months of implementation, with highly statistically significance differences between three times of evaluation (P=0.0001**).

Table (5): Correlation matrix between authentic Leadership Training Program for Head Nurses on Innovative Work Behaviors pre, immediate and post three months of implementation:

		Pre		Immediate post program		Post 3 months	
		Innovation work behaviors	Authentic leadership of head nurse	Innovation work behaviors	Authentic leadership of head nurse	Innovation work behaviors	Authentic leadership of head nurse
Innovation work behaviors	R	1		1		1	
	P- value						
Authentic leadership of head nurse	R	0.090	1	0.245	1	0.361	1
	P- value	0.422		0.005**		0.001**	
Head nurse knowledge about authentic leadership	R	0.107	0.204	0.651	0.228	0.396	0.300
	P- value	0.342	0.067	0.002**	0.040*	0.003**	0.006**

*Correlation is significant at the 0.05 level   **Correlation is significant at the 0.01 level

Table (5) shows that strong positive statistical significant correlation are found between the authentic leadership skills of head nurses and nurses' innovative work behaviors immediate post-program (R=0.245, P=0.005**). Also, there is a positive statistical significant correlation between head nurse knowledge about authentic leadership and nurses' innovative work behaviors immediately and post three months of implementation (R=0.65, P=0.002**), and (R=0.396, P=0.003**) irrespectively. As well as there is a positive statistical significant correlation between head nurse knowledge about authentic leadership and authentic leadership skills of head nurses post immediately and post three months of implementation (R=0.228, P=0.040*) and (R=0.300, P=0.006**).

Discussion:

Authentic leadership is currently becoming a crucial shared social practice among nurses and across teams to achieve long-term innovative performance and organizational resilience. Because authentic leadership is a new perspective that focuses on a leader's values and beliefs, it is critical for head nurses to incorporate authentic leadership into clinical nursing practice to foster a-culture of trust and loyalty that encourages creative thinking and resilience. As a result, it's not surprising that organizations devote a significant amount of time and money to improving the skills of their leaders. In essence, an organization's success or failure is determined by the performance and efficacy of its personnel, as well as the direction receives from leadership **(Abd-Elmawla et al., 2020).** Therefore, this study was directed to investigate the effect of the authentic leadership educational program on nurse's innovation behaviors.

The findings of the current study related to the socio-demographic data of the head nurses revealed that one third of head nurses aged between 30 to < 35 years old with average mean age (34.9 ± 5.7 year). About gender, more than half of them were males, and one third of them had 1 to 5 years of experience. As regarding educational qualification and marital status, it was noted that the majority of them had bachelor degree and married. For the hospital name, nearly half of them worked in Pediatric and Gynecology University Hospital. Moreover, half of them had>4000 salary, and for residence; about two third of them lived in rural area.

Also, the findings of the current study related to the socio-demographic data of nurses revealed that nearly half of nurses aged between 25 to< 30 years old with average mean age (28.8 ± 5.8 year). About gender, about two third of them were females, and nearly half of them had 1 to 5 years of experience. As regarding educational qualification and marital

status; about two third of them had technical institute degree of nursing and were married. For the hospital name; one third of them work in Pediatric and Gynecology University Hospital, nearly half of them have 2000:3000 salary and for residence more than half of them lived in rural area.

Regarding head nurses knowledge about authentic leadership

Regarding head nurses *knowledge scores about authentic leadership dimensions*, the findings of current study demonstrated that head nurses had low mean in pre-program implementation increased in immediate and post 3 months for all dimensions of authentic leadership knowledge (definition of authentic leadership, characteristics of authentic leadership, characteristics of authentic leaders, components of authentic leadership, perspectives of authentic leadership, importance of authentic leadership, approaches of authentic leadership, and models of authentic leadership)with highly statistically significance differences between three times of evaluation. This result may be due to most of head nurses have no previous training program in authentic leadership skills and the novelty of the concept.

This results agreed with **Ali et al. (2019)**, who showed that most head nurses had low score about definition, components, and characteristics of authentic leadership in pre-program and increased in immediate and post 3 months with a statistically significant difference between the three phases of the program.

Also, this result agreed with **Aboelenan and Mostafa (2023),** who found that there were highly variation in definition, components, and characteristics of authentic leadership at each of the three stages of the program (pre, immediately and, three months after the program implemented). As the participants had low score in pre-program and increased in immediate and post 3 months.

Regarding *total knowledge of head nurses* about authentic leadership; the findings of current study demonstrated none of the studied head nurses have high knowledge about authentic leadership in preprogram, increased immediately and post three months of implementation with highly statistically significance differences between three times of evaluation. This may be due to most of head nurses didn't attend previous training program in authentic leadership and didn't recognize the importance of authentic leadership. Also, those head nurses studying leadership many years ago and they have no update of their knowledge. Also, the lack of training program is due to a lack of concern from responsible authorities in the hospital.

Although almost all participants' knowledge scores improved after the program was implemented; most head nurses demonstrated a high level of authentic leadership practice. It's possible due to their active involvement and interest in the program sessions and frequent review of their knowledge.

Van (2016) noted that authentic leadership is an emerging style and need appropriate strategies to facilitate its practice through training program. In the same line, **Abdallah et al., (2019)** supported our study finding and stated that head nurses don't use their leadership role effectively due to lack of their knowledge and improper training.

Also, **Ali et al. (2019)** asserted that training programs regarding authentic leadership is considers a new trend in Egyptian nurses' culture. Also, they showed that post educational program, most head nurses have adequate

knowledge level regarding authentic leadership with a statistically significant difference between the three phases of the program.

In addition, this result agreed with **Nagib et al. (2020)** who found head nurses knowledge regarding authentic leadership improved post program than pre-program implementation. Moreover, **Abd Elmawla et al. (2020)** showed that the knowledge of head nurses was below the acceptable level before implementing the program and, reported that pre-program no one had a good level of total knowledge, changed to majority of head nurses got good level immediate and three months post-program.

Moreover, this result agreed with **Saleh et al., (2021)** who found head nurses knowledge and practices regarding authentic leadership improved post program than pre-program implementation. And this result is in same line with **Aboelenan and Mostafa (2023),** who indicated that head nurses' knowledge levels were low pre-program implementation while, they had higher scores with statistically significant differences immediately and post program implementation.

Regarding head nurses authentic leadership skills

Regarding head nurses authentic leadership skills dimensions, the findings of the present study revealed that head nurses had low mean score in pre-program implementation increased in immediate and post three months for all dimensions of authentic leadership skills (self-awareness, internalized moral perspective, balanced processing, relational transparency) with highly statistically significance differences between three times of evaluation.

This may be due to most of head nurses didn't attend previous training program in authentic leadership and they recognize the importance of authentic leadership, and beginning to practice the authentic leadership skills well. Also, the program aided those head nurses in performing their leadership roles effectively, as well as providing them with the opportunity to engage in open dialogue, evaluate and value different points of view, genuinely study life history, share experiences with others, and learn from others' stories.

Regarding **"self-awareness dimension"** the findings of the present study revealed that head nurses had low mean score in pre-program implementation increased in immediate and post three months of implementation. This might be due to head nurses didn't have the ability to focus on themselves and their actions, thoughts, or emotions do or don't align with their internal standards.

This results agreed with **Nagib et al. (2020)** who found head nurses "self -awareness dimension" was improved post program than pre-program implementation. While, this result is disagreed with **Tanafranca (2018)** indicated that no statistical significance differences recorded with "self - awareness dimension" of authentic leadership pre- and post-training intervention.

Regarding **"balanced -processing dimension"** the findings of the present study revealed that head nurses had low mean score in pre-program implementation increased in immediate and post three months of implementation. This might be due to the head nurses didn't distort, exaggerate, or ignore information and they didn't objectively analyze all the important data before making a decision.

This results agreed with **Saleh et al. (2021)** who found head nurses "balanced processing dimension" was improved post program than pre-program implementation. While, this result is not congruent with **Tanafranca (2018)**

who indicated that no statistical significance differences recorded with "balanced processing dimension" of authentic leadership pre- and post-training intervention.

Regarding **"relational –transparency dimension"** the findings of the present study revealed that head nurses had low mean score in pre-program implementation increased in immediate and post three months of implementation. This might be due to the head nurses didn't able to valuing and achieving openness and truthfulness in their relationships. Also, not being clear, consistent, and reliable about policies and the way to go about upholding policies, and it was not about being genuine with employees.

This result is compatible with **Saleh et al. (2021)** who found head nurses "relational transparency dimension" was improved post program than pre-program implementation. However, this is not compatible with **Tanafranca (2018)** who indicated that no statistical significance differences recorded with "balanced processing dimension" of authentic leadership pre- and post-training intervention.

This result disagreed with **Abd Elhamed and Hessuin (2022)** who confirmed that, regarding authentic leadership dimensions, relational transparency had the highest mean scores, and highly statistically significant between all dimensions authentic leadership. This might be because relational transparency helps leaders to be more effective, which in turn makes it easier to gain the trust of their followers.

Regarding **"moral -perspective dimension"** the findings of the present study revealed that head nurses had low mean score in pre-program implementation increased in immediate and post three months of implementation. This might be due to the head nurses didn't able to set aside their own interests and act in the best interests of others. This notion of doing what's best for others at least some of the time underlined ethical behavior.

This result agreed with **Aboelanen and Mostafa (2023)** who found head nurses "balanced processing dimension" was improved post program than pre-program implementation. However, this result is disagreed with **Puni and Hilton (2020)** who demonstrated that internalized moral perspective being the highest predictor.

Regarding *total head nurses authentic leadership skills*, it was noted that head nurses had low level of authentic leadership skills in pre-program implementation, increases to 65.40% had high level in immediately after implementation and 63% had high level post three months of implementation with highly statistically significance differences. This may be due to most of head nurses didn't attend previous training program in authentic leadership, and the effect of training program they had in the study.

This result is matched with **Ali et al. (2019)** who showed that most head nurses had low score about authentic leadership skills in pre-program and increased in immediate and post three months with a statistically significant difference between the three phases of the program. Also, this result agreed with **Aboelanen and Mostafa (2023)** who found that head nurses' authentic leadership skills levels were low pre-program implementation while, they had higher scores with statistically significant differences immediately and post program implementation.

On the other hand, this result is disagreed with **Rego, et al. (2016)**, who proposed that the average value was obtained by authentic leadership and its four dimensions is

slightly below the midpoint of the range. Moreover, **Alilyyani (2022)** found that there were significant and positive effects of authentic leadership and its four components on trust in managers. However, no relationships were found between authentic leadership and its four elements, and job performance.

Regarding innovative work behaviors

Regarding nurses innovative work behaviors dimensions, the results showed that nurses had low mean score in pre-program implementation increased in immediate and post three months for all dimensions of innovative work behaviors (idea exploration, idea generation, idea championing, idea implementation ,and recognizing and support) with highly statistically significance differences between three times of evaluation.

This result could be explained with that most nurses can give great innovative ideas but had no plans for implementation of this ideas and don't take the appropriate measures to put this ideas in action. Also, the hospital don't gives their employees a space of freedom for innovation and help them implement innovative ideas. After the program head nurses begun to respond positively to nurses and allow them to think for themselves, allowing them to be more innovative.

Regarding "idea exploration dimension", the findings of the present study is agreed with **Carmeli et al., (2006)** who described innovative behavior as the process of bringing new problem solving and transfer ideas into use. This is followed by the development of new ideas and solutions. This may be related to nurses at different care units usually dealing with patients who require complex assessments and interventions this enhance their ability to think critically and introduce innovative solutions.

Regarding "idea generation dimension", and "idea implementation dimension", the findings of the present study are compatible with **Aboelanen and Mostafa (2023)** who revealed that nurses had low mean score in idea generation and in idea implementation pre-program implementation increased in immediate and post three months of implementation.

On other hand, these results are disagreed with **El-Demerdash, et al. (2020),** who found that two-third of the participants demonstrated a moderate level of idea exploration in the pre-program stage. Also, **Effendy** and **Sukmarani (2022)** found that high innovative work behavior results are obtained from the calculation of the categorization of each innovative work behavior dimension, namely idea exploration, idea generation, idea championing, and idea implementation which had a high mean scores level.

In addition, **Qin Niuf et al., (2022)** found that the majority of the nurses demonstrated a moderate level of innovative work behavior dimensions in the preprogram stage, with high level of idea generation, which refers to generating innovative ideas to solve problems or to improve performance.

Regarding *total level of nurses' innovative work behaviors*, the results of the current study illustrated that nurses had low level in pre-program implementation increased in immediate and post three months of implementation. This could be because leaders respond positively to staff nurses and allow them to think for themselves, allowing them to be more innovative.

This result is in accordance with **Abd El Muksoud, (2022)** who found that the level of innovative work behaviors

slightly more than one third of nurses had a high level of innovative work behaviors. The potential explanation for this result

may be attributed to the fact that the innovation behavior is comparatively new and unfamiliar concept for nurses; so they didn't interested in enhancing these behaviors in their units.

Also, this result is agreed with **Aboelanen and Mostafa (2023),** who illustrated that nurse's innovation behaviors increased immediately post program implementation and post three months of implementing program compare with pre-program implementation with highly statistically significant differences during different times of testing. This could be because leaders respond positively to staff nurses and allow them to think for themselves, allowing them to be more innovative.

On the other hand, this result is disagreed with **Shama** and **Ahmed**, (**2022**), who found that the majority of nurses had high level of innovative behavior. This might be due to nurses were familiar with the concept and to which extent it is essential to be practiced during their work and the importance of educational program in improving their competencies of innovation.

Regarding the correlation between head nurses' authentic leadership and nurses' innovative work behaviors, the findings of the current study revealed that there was a strong positive statistical significant correlation found between the authentic leadership skills of head nurses and nurses' innovative work behaviors immediate post-program. These attributed to those authentic leaders can alter staff nurses' work attitudes and actions through their leader behaviors, which provide their staff nurses caring, resources and organizational support, involving them in any decision and providing needed information in hospitals and authentic leadership.

Laguna et al., (2019) found a significant association between authentic leadership and innovation. Added that authentic leadership is necessary for nurses as it promote a positive attitude and innovation performance as well as building their future hopes and help them to find meaningful connection with their work and assist them to do the required task in a novel way. In the same line **Hassan and Din (2019)** indicated that authentic leadership had a considerable impact on staff members' innovation, since knowledge sharing mediated the association between employee creativity.

Anwar et al. (2020) supports this study results and found that significant association between authentic leadership and nurse's innovation. As nurses, who are resilient can find creative ways to overcome the situation and the difficult as mean to grow. Also, this is agreed with **Khan et al., (2021)** who suggested that authentic leadership plays significant role in generating culture of knowledge sharing and innovation.

Conclusion:

According to the findings of the current study, head nurses' knowledge score and levels of authentic leadership skills were low in pre-program implementation; while, they had higher scores with statistically significant differences in post program implementation and in after three months of implementation. Also authentic leadership educational program had a positive effect on staff nurses' innovation behavior which increased in immediate post program and post three months than pre- program.

Recommendations:

Based on the findings of the current study, the following recommendations were suggested:

- Implement an authentic leadership educational program and workshops for all head nurses to increase their competencies regarding their authentic leadership.
- Encourage hospital administrators to reforming their hospital policy to emphasize authentic leadership coaching behaviors as an effective approach to support head nurses in a variety of positions.
- Create a supportive working environment that enhancing nurse's innovation by enough resource, and time that help in building relationships, and increasing communication.
- Offer continuous staff development activities and workshops to enforce innovation skills in nursing profession and empower nurses.

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