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Nurses' Personality Traits as a Mediator between their Artificial Intelligence Perception and Innovative Work Behaviors

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Abstract

Background: Personality traits and technology may affect how well nursing utilize their abilities and strategies to achieve their objectives and innovations at the place of work. So, nurses' personalities have a great influence on their creativity and innovative behavior involved using artificial intelligence. **The study aimed** to assess the nurses' personality trait as a mediator between their artificial intelligence perception and innovative work behaviors. **Research design:** A descriptive correlational research design was applied. **Setting:** The research was conducted on different hospitals in Minia City. **Sample:** A Purposive sample with a total number of 329 nurses. **Tools of data collection:** Three tools were used, 1st tool was Big Five Inventory, 2nd tool was Perception of Artificial Intelligence Scale and the 3rd tool was Innovative Work Behaviors scale. **Results:** Revealed that the highest mean scores of nurses were for conscientiousness traits, followed by openness and agreeableness personality. Moreover, fewer than fifty percent of nurses had a high as well as a moderate level of perception of artificial intelligence. Also, approximately three quarters of nurses had high level of innovative work behaviors. **Conclusion:** There was a significant positive correlation between nurses' total perception of artificial intelligence as well as their innovative work behaviors and all dimensions of personality traits except neuroticism dimension. **Recommendations:** Training programs should emphasize the benefits and practical applications of AI in nursing to alleviate fears and resistance, particularly among those with high neuroticism personality.

Keywords: ***Artificial Intelligence Perception, Innovative Work Behaviors, Mediator, Nurses & Personality Traits***

Introduction

The use of artificial intelligence (AI) is expanding in popularity and is considered a crucial component of healthcare in the modern era of advanced technology and digitization. It helps change clinical skills, decision-making, as well as patient care to boost productivity, enhance diagnostic precision, and customize management regimens **(Sheliemina, 2024; Sharma & Jindal, 2024).** Consequently, in order to flourish in this dynamic environment, enhance job trajectories and abilities, nurses must acquire the recent soft skills, adjusting personality traits, and acquiring knowledge based on evidence that are required **(Lérias et al., 2024).**

Artificial Intelligence Technology (AIT) is a field of computer science that aims to mimic human brain function by automating a variety of activities, such as learning and decision-making, and by accomplishing tasks or solving issues that are also utilized in patient care **(Abdel Gawad et al., 2024**). Three types of artificial intelligence (AI) are used in hospitals as machine learning, which is a statistical technique set for problem-solving; deep learning, which is a machine learning approach and neural network extension; and natural language processing, which is the most recent and relates to the fusion of linguistics and artificial intelligence and includes intelligent analysis of written language **(Altas, 2020)**.

The relation between personality traits as well as acceptance of technology and innovation has been the topic of extensive evidence, with several studies highlighting the significance of person personality characteristics in shaping one's awareness and acceptance of technology. Moreover, the Big Five personality traits model provides a comprehensive framework to understand how different personality dimensions may influence attitudes toward AI **(Mohamed et al., 2024)**.

The Big Five personality traits framework classified personality into five dimensions: openness, conscientiousness, extraversion, agreeableness, as well as neuroticism (OCEAN) **(Soto, 2018).** Openness involves receptiveness to new experiences; conscientiousness denotes diligence and

responsibility; extraversion encompasses sociability; agreeableness signifies compassion as well as cooperation; and neuroticism involves unstable emotions and anxiety. People who are highly open are more likely to be open to change and have favorable opinions about AI. In contrast, those high in neuroticism may have negative attitudes toward AI, perceiving it as threatening. Highly agreeable individuals might also be more skeptical of AI's impact on interpersonal aspects of patient care **(Park & Woo, 2022).**

Perception toward artificial intelligence is defined as the integration of sensory impressions into information that is psychologically meaningful **(Kundaliya et al., 2022)**. It is crucial to comprehend nurses' views on AI adoption, as this will help ensure these technologies are implemented successfully. The use of artificial intelligence in nursing shows its distinct benefits. It can assist in the optimization of nursing procedures, enhance the efficiency of nursing practice, and promote precision nursing. AI can effectively analyze vast quantities of intricate data to assist in diagnosing a range of medical conditions and alleviate the burden on healthcare professionals; Models for predicting disease risk that are constructed using machine learning algorithms can rapidly detect diseases. Nonetheless, using AI in nursing has disadvantages and brings up ethical concerns **(Wang et al., 2024)**

Creativity and innovation are important ways to obtain a competitive edge in the fast-paced workplace of today. Health care organizations must outperform creative rivals and foster innovation in order to thrive in the face of rapidly evolving technology, fierce domestic and international competition, an unpredictable and extremely tumultuous economic climate **(DeMarco, 2023).**

The behavioral process through which novel methods or approaches are developed and applied to advance health, fend off illness, and enhance nursing quality is known as innovative Work behavior (IWB) in nursing. Developing a concept, gaining support, and putting the idea into action are its three phases. Nurses consider how AI might be enhanced or changed in light of work experience, patient demands, and current circumstances in order to optimize AI nursing's efficacy **(Li et al., 2024).** While many factors contribute to IWB, supporting managerial techniques that can be used to develop nurses' innovative potential include diversity management, AI, and job crafting **(Irfan & Qadeer, 2020).**

Last and not least, one of the most important development strategies for corporate competitiveness is the IWB of nurses in the workplace. Since innovation can increase organizational competitiveness at the individual, group, and even enterprise-wide levels, it can improve organizational survival in a highly competitive environment. Nurses can gain a better understanding of the requirements for medical AI by working with AI core users **(Roberts & Candi, 2024)**.

Significance of the study

Drawing upon the technology acceptance model, which postulates that perceived affluence of usage and perceived helpfulness are key determinants of technology acceptance, it can be inferred that personality traits play a critical role in shaping these perceptions **(Marikyan & Papagiannidis., 2023**). Moreover, the Big Five personality traits model provides a comprehensive framework to understand how different personality dimensions may influence attitudes and perception of AI **(Schepman & Rodway 2023 & Zhang et al., 2022).**

Recent studies from Africa have shed light on the unique challenges and opportunities presented by AI in healthcare, emphasizing the need for culturally sensitive approaches to AI integration **(Ohalete et al., 2024)**. In Asia, the rapid adoption of AI in healthcare has prompted investigations into the influence of personality traits on AI acceptance among nursing students and professionals, highlighting differences in attitudes compared to Western counterparts **(Labrague et al., 2023, Hamedani et al., 2023 & Atta et al., 2024)**. Similarly, studies have begun to explore the intersection of AI, healthcare, and personality traits in various cultural settings. For example, research in South America has examined the role of personality in the acceptance of AI among healthcare workers, revealing distinct patterns influenced by cultural values and healthcare systems **(Riedl, 2022)**.

Furthermore, the few studies that have explored the relation between personality traits and attitudes toward technology in healthcare have largely been conducted in Western and Eastern contexts, leaving a gap in our understanding of how these dynamics play out in the Middle East, especially Egypt. Additionally, based on the researchers' observations in a variety of healthcare settings, there is a persistent focus on treatment outcomes, quality, and cost, which continued to push AI technology forward for wider implementation. In this research, researchers stressed nurses' personality traits as a mediator between their artificial intelligence perception and innovative work behaviors.

Aim of the study

The present research was introduced to assess the nurses' personality traits as a mediator between their artificial intelligence perception and innovative work behaviors.

Research questions:

1. What are the levels of nurses' perception of AI?
2. What are the levels of nurses' innovative work behaviors?
3. What is the relation between nurses' personal data, their personal traits, perception of AI and innovative work behaviors?
4. Are nurses' personality traits significantly associated with their perception of AI?
5. Are nurses' personality traits significantly associated with their innovative work behaviors ?

Subjects and Method

Research Design:

A descriptive correlational research design was utilized in the presented research.

Study Setting:

The research was conducted on different Minia Governorate's hospitals at Minia City according to the simple random sample for hospital selection as "Mental Health and Addiction Treatment Hospital" which serves the Minia Governorate's nine districts and is connected to the Ministry of Health, and is based in New Minia City" also, this research was conducted on Minia University Hospitals as Emergency University Hospital; Renal and Urology University Hospital; Liver University Hospital and Pediatric and gynecology University Hospital.

Sample:

A Purposive sample included in this research. Based on data from literature, the sample size was determined **(Ahmed et al., 2024)** using the following formula:

$$n = \frac{(Z1-\alpha/2)^2.SD^2}{d^2}$$

Where d is the absolute error or precision, SD is the standard deviation of the variable, and Z1-α/2 is the standard normal variate, which is 1.96 for five percent type 1 error. Thus. So,

$$n = \frac{(1.96)^2.(17.581)^2}{(1.9)^2} = 328.9$$

Depend on the previous formula, the total sample size needed for this research was 329.

The criteria for inclusion in this research as both sex of nursing more than two years in nursing experience and accept to share in this research.

Study Tools:

The tools of this research were composed of three tools namely, Big Five Inventory, Perception of Artificial Intelligence Scale, and Innovative Work Behaviors Scale.

Tool I: consisted of two parts:

Part one: Personal characteristics. It included self-reported information was designed to obtain personal data of the nurses including "age, gender, educational level ,marital status, residence, years of nursing experience, and hospital name.

Part II: Big Five Inventory BFI:

This scale that was originally created by **(John et al., 1991).** It is utilized to measure the five big personality traits, and it composed of forty-four items with five subscales described in the following table:

Personality traits' subscales	Items no.
Openness	Ten
Consciousness	Nine
Extroverts	Eight
Agreeableness	Nine
Neuroticism	Eight
Total items	Forty-four

The response for each item was through five-points Liker-type scale, ranged from 1 = strongly disagree to 5 = strongly agree for the positive items. However, the response for reversed items ranged from 5= strongly disagree to1= strongly agree, these items are 2,6,8,9,12,18,21,23,24,27,31,34,35,37,41 and 43.

Tool (II): Perception of Artificial Intelligence (AI scale):

This scale was developed by **Abdullah & Fakieh, (2020).** It was utilized to assess the nurses' perception towards using AI in health care. This scale was included fourteen questions classified under three subscales described in the following table:

Subscales	Items no.
AI knowledge	Four
AI Advantages	Five
AI Problems in the health care	Five
Total questions	**Fourteen**

The response for each question was five-points Liker-type scale, ranged from 1 = strongly disagree to 5 = strongly agree, so the scoring system was divided into 14:32 was considered as low perception, a score of 33:51 was considered as moderate perception level and a score of 52:70 was considered as high perception

Tool (III): Innovative Work Behaviors Scale (IWBS): This tool was developed by **Messmann and Mulder (2012) and modified by the Abd el hamied et al ;(2023).** to assess nurses' IWB. It was included (forty- two items) and was divided into five dimensions described in the following table:

Dimensions	Items no.
Opportunity exploration	Four
Idea generation	Twelve
Idea championing	Eleven
Idea implementation	Seven
Recognizing and support	Eight
Total items	**Forty- two**

The response for each question was calculated through three-points Liker-type scale; 1 = disagree,

2= neutral, and 3 = agree, so the scoring system was divided into good level of IWB if the score >75 %, fair level of IWB if it was 50-74 %, and poor level of IWB if < 50%.

The tools validity and reliability:

Five faculty members with expertise in the research topic evaluated the tools' face validity (Psychiatric Nursing Department and Administration Department) to determine the degree to which the items' sequencing, simplicity, relevance, applicability, phrasing, and overall appearance were presumed to be measured. The required changes were made in response to the advice and criticisms of experts.

To verify tool uniformity, reliability tests were conducted. The Cronbach alpha test was used to assess the tools' reliability, and the results showed that the scales had good internal reliability as follows BFI was 0.901; perception of AI was 0.897; and IWBS was 0.905.

Pilot Study:

A pilot study was carried out before the research began. Ten percent (33 nurse)of the entire sample is included; pilot research was conducted to assess the study tools' clarity, feasibility, completeness, objectivity, appropriateness, and application, also to identify any potential issues with the methodological approach or tool, and to calculate the time required to finish the tools. No modification was done, the sample of the pilot study was excluded in the research. Participants required at least 20 to 25 minutes completing the questionnaires.

Procedure:

A review of relevant literature that addresses many facets of the issue was utilized through books and journals that are readily available in order to familiarize oneself with the research challenge and choose the best study instruments. Arabic translations were made for the tools. To assess the validity of the instruments, a jury committee consisting of five experts in nursing administration as well as psychiatric and mental health nursing reviewed and validated them. After outlining the nature of the activity, the directors of the prior hospitals granted their official approval. To improve collaboration, the researchers gave each nurse an explanation of the purpose of the study. Each study participant gave their oral agreement after being informed of the study's objectives. Participants were provided with study instruments during data collection. It took between 20 and 25 minutes to complete the tools. In order to gather data, the real fieldwork began in early Jun 2024 and ended in late August 2024. Data is collected every two days. Based on the nurses' work schedules, the researchers planned their visits to each facility.

Administrative Design

A written initial approval was obtained from the Faculty's Research Ethics coded with " REC202454 ". Permission to conduct the research was obtained from the Dean of the Faculty. Written agreements were obtained from the directors of the previously mentioned hospitals as well as the nursing director after explained the purpose of the research.

Ethical considerations:

Before the pilot study and the actual research were conducted, a formal letter was issued by Minia University's Faculty of Nursing's Research Ethics Committee. After informing the participating nurses about the study's nature and goals, the nurses gave their oral agreement. Participants in the study are free to decline participation or to leave at any moment without providing a reason. The privacy of study participants was taken into account as data was being collected. Participants were given the assurance that all of their information would be kept completely private and anonymous, as each participant would be given a number rather than their names to preserve their privacy.

Statistical Analysis:

Version 20.0 of SPSS for Windows was used for all statistical analyses (SPSS, Chicago, IL). The mean ± standard deviation (SD) was used to express continuous data that had a normal distribution. Numbers and percentages were used to represent categorical data. When comparing more than two variables with continuous data, the one-way analysis of variance (ANOVA) test was employed. To compare variables using categorical data, the chi-square test (or fisher's exact test, if applicable) was employed. Two variables with continuous data were tested for relationships using the correlation coefficient test. For the study's questionnaires, the reliability (internal consistency) test was computed. The threshold for statistical significance was p value less 0.05.

Results:

Table (1): Studied Nurses' personal data (No.=329)

Personal data	No.	%
Age (Years)		
21 – 30	241	**73.3**
31 – 40	57	17.3
≥ 41	31	9.4
Mean ±SD	29.2 ±3.8	
Gender		
Male	90	27.4
Female	239	**72.6**
Educational level		
Bachelor of nursing	141	**42.9**
Technical institute of nursing	117	35.5
Secondary school nursing diploma	71	21.6
Marital status		
Single	101	30.7
Married	228	**69.3**
Residence		
Rural	216	**65.7**
Urban	113	34.3
Years of nursing experience		
< 5	170	**51.7**
5 – 10	71	21.6
> 10	88	26.7
Mean ±SD	4.3 ±2.6	

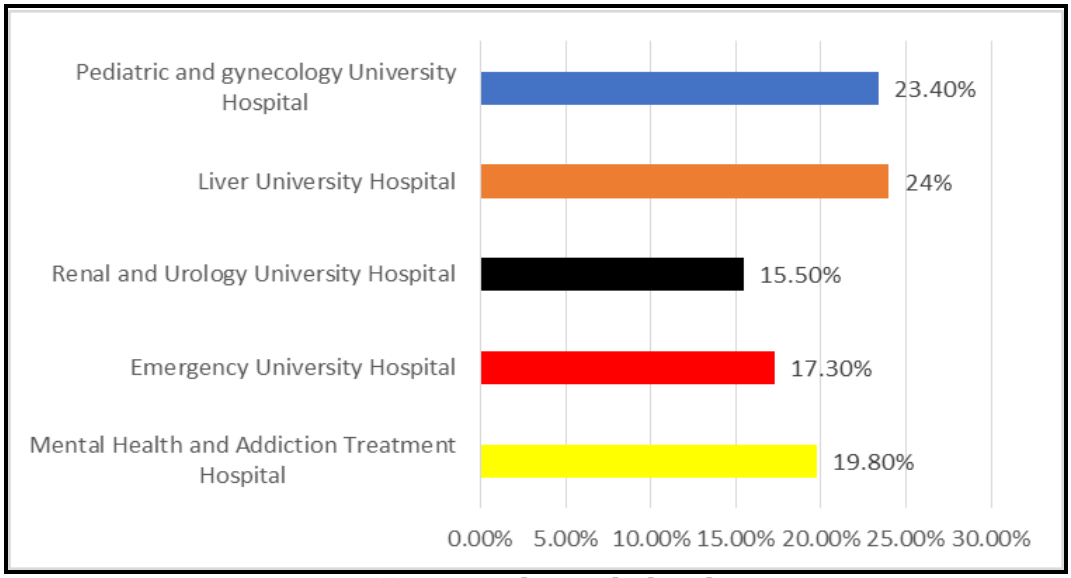

Figure (1): Nurses' hospitals distribution.

Table (2): Mean scores of nurses' personality traits dimensions (No.=329)

Personality traits dimensions	Mean ±SD
Openness	**13.2 ±3.3**
Extraversion	8.9 ±2.3
Conscientiousness	**14.4 ±3.0**
Agreeableness	**13.2 ±2.2**
Neuroticism	7.4 ±3.6

Table (3): Nurses' responses to perception about artificial intelligence dimensions (No.=329)

AI dimensions	Low		Moderate		High	
	no.	%	no.	%	no.	%
AI knowledge	48	14.6	145	**44.1**	136	**41.3**
AI advantages	50	15.2	145	**44.1**	134	**40.7**
AI problems in health care	50	15.2	150	**45.6**	129	39.2

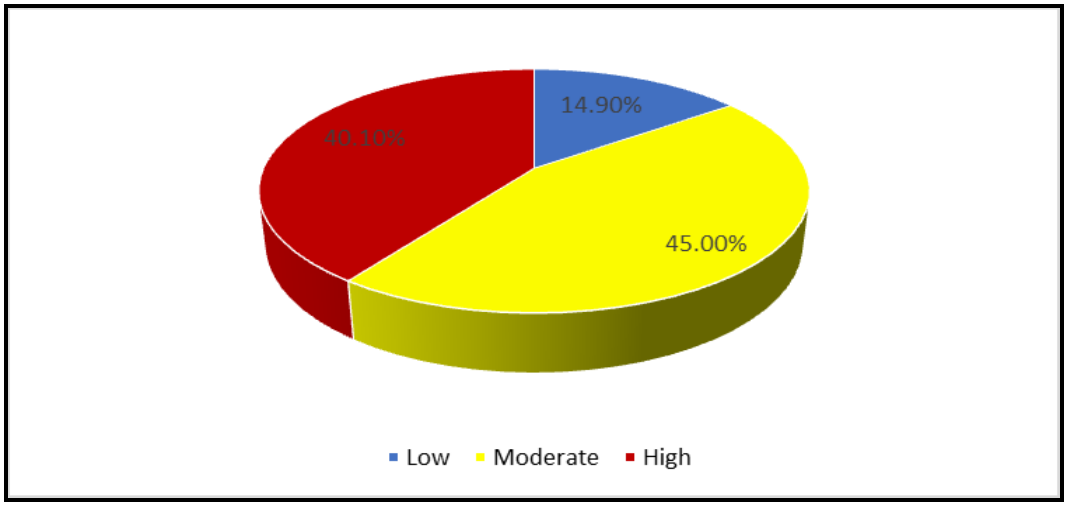

Figure (2): Nurses' total perception about artificial intelligence (No.=329)

Table (4): Nurses' responses to innovative work behaviors dimensions (No.=329)

Innovative work behaviors dimensions	Poor		Fair		Good	
	No.	%	No.	%	No.	%
Opportunity exploration	17	5.2	70	21.3	242	**73.5**
Idea generation	18	5.5	67	20.4	244	**74.1**
Idea championing	19	5.8	67	20.4	243	**73.8**
Idea implementation	21	6.4	71	21.6	237	**72.0**
Recognizing and support	20	6.1	70	21.3	239	**72.6**

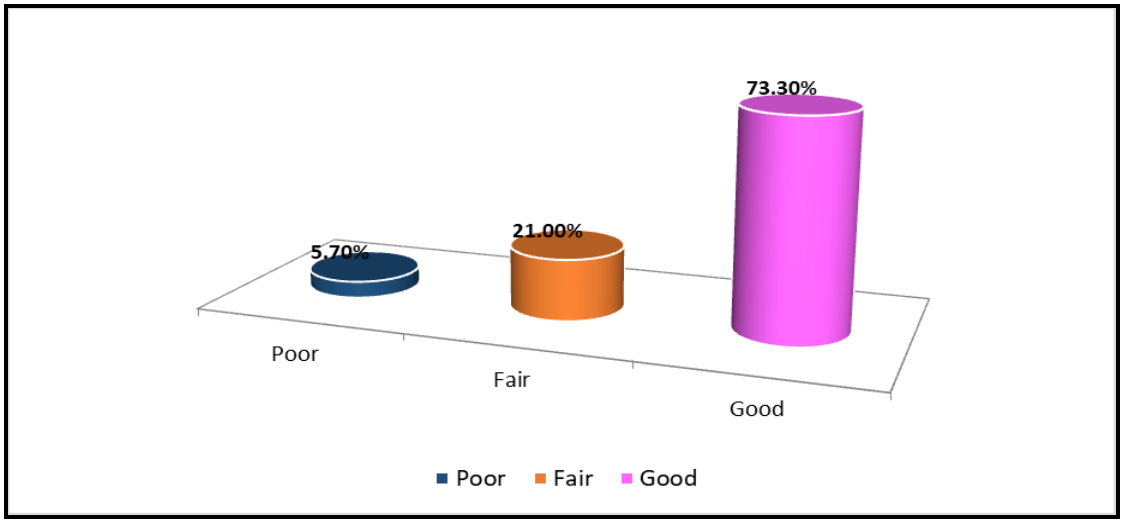

Figure (3): Nurses' total responses levels to innovative work behaviors (No.=329)

Table (5): Relation between the nurses' personal data and their personality traits dimensions (No.=329)

Nurse personal data	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Age (Years)					
21 – 30	9.0 ±2.4	13.0 ±2.2	14.3 ±3.1	7.8 ±3.7	13.5 ±3.4
31 – 40	8.6 ±2.0	13.5 ±2.2	15.1 ±3.0	6.4 ±2.6	13.7 ±2.8
41 – 50	8.4 ±1.9	13.8 ±1.5	13.3 ±2.4	6.8 ±2.3	10.2 ±1.6
Oneway ANOVA	F=1.675, P=0.189	F=2.583, P=0.077	F=3.631, P=0.028*	F=4.494, P=0.011*	F=15.723, P=.001**
Gender					
Male	9.8 ±2.4	13.3 ±1.9	14.2 ±3.4	5.2 ±2.5	12.9 ±3.5
Female	8.5 ±2.2	13.1 ±2.3	14.4 ±2.9	8.3 ±3.1	13.4 ±3.3
t – test	T=4.587, P=0.001**	T=0.696, P=0.487	T=0.638, P=0.524	T=8.500, P=0.001**	T=1.055, P=0.292
Educational level					
Bachelor of Nursing	8.8 ±2.3	13.2 ±2.3	14.0 ±3.3	7.3 ±3.2	13.2 ±3.7
Technical institute of nursing	9.2 ±2.6	13.3 ±2.3	14.5 ±3.0	7.0 ±3.3	13.3 ±2.7
Secondary school nursing diploma	8.4 ±1.7	13.0 ±1.7	14.8 ±2.4	8.3 ±2.8	13.1 ±3.4
Oneway ANOVA	F=3.194, P=0.042*	F=0.547, P=0.579	F=2.085, P=0.126	F=3.897, P=0.021*	F=0.085, P=0.918
Marital status					
Single	9.0 ±2.0	13.2 ±2.6	13.0 ±3.4	7.9 ±3.2	13.8 ±3.8
Married	8.8 ±2.4	13.1 ±2.0	15.0 ±2.7	7.4 ±3.7	13.0 ±3.1
t – test	T=0.705, P=0.482	T=0.408, P=0.683	T=5.641, P<0.001**	T=1.427, P=0.154	T=1.829, P=0.068
Residence					
Rural	8.9 ±2.4	13.4 ±2.2	14.7 ±2.9	7.8 ±3.0	13.6 ±3.5
Urban	8.9 ±2.1	12.6 ±2.1	13.8 ±3.3	6.8 ±2.6	12.5 ±2.8
t – test	T=0.253, P=0.801	T=3.231, P=0.001**	T=2.480, P=0.014*	T=3.001, P=0.003*	T=2.894, P=0.004*
Years of nursing experience					
< 5	8.6 ±1.7	13.0 ±2.4	13.7 ±3.2	8.1 ±3.6	13.3 ±3.6
5 – 10	10.3 ±3.0	13.7 ±1.4	15.6 ±2.1	6.0 ±2.8	14.7 ±2.1
> 10	8.2 ±2.3	13.0 ±2.1	14.7 ±3.1	7.3 ±3.1	12.0 ±3.1
Oneway ANOVA	F=20.424, P=0.001**	F=2.848, P=0.059*	F=12.161, P=0.001**	F=10.166, P=0.001**	F=14.113, P=0.001**

Table (6): Relation between the nurses' personal data and their perception about artificial intelligence (No.=329)

Personal Data	Low perception (n=49)		Moderate perception (n=148)		High perception (n=132)		Chi – square / fisher's exact test	P
	no.	%	no.	%	no.	%		
Age (Years)								
21 – 30	37	75.5	85	57.4	119	90.2		
31 – 40	6	12.2	38	25.7	13	9.8		
41 – 50	6	12.2	25	16.9	0	0.0	42.798	**0.001****
Gender								
Male	12	24.5	46	31.1	32	24.2		
Female	37	75.5	102	68.9	100	75.8	1.880	0.391
Educational level								
Bachelor of Nursing	15	30.6	45	30.4	81	61.4		
Technical institute of nursing	8	16.3	64	43.2	45	34.16		
Secondary school nursing diploma	26	53.1	39	26.4	6	4.5	67.064	**0.001****
Marital status								
Single	19	38.8	38	25.7	44	33.3		
Married	30	61.2	110	74.3	88	66.7	3.688	0.158
Residence								
Rural	31	63.3	98	66.2	87	65.9		
Urban	18	36.7	50	33.8	45	34.1	0.149	0.928

Personal Data	Low perception (n=49)		Moderate perception (n=148)		High perception (n=132)		Chi – square / fisher's exact test	P
	no.	%	no.	%	no.	%		
Years of nursing experience								
< 5	41	83.7	93	62.8	36	27.3		
5 – 10	6	12.2	28	18.9	37	28.0		
> 10	2	4.1	27	18.2	59	44.7	62.813	**0.001****

Table (7): Relation between the nurses' personal data and their innovative work behaviors (No.=329)

Personal Data	Poor level (n=19)		Fair level (n=69)		Good level (n=241)		Chi – square / fisher's exact test	
	no.	%	no.	%	no.	%	X^2	P
Age (Years)								
21 – 30	13	68.4	45	65.2	183	75.9		
31 – 40	0	0.0	18	26.1	39	16.2		
41 – 50	6	31.6	6	8.7	19	7.9	17.979	**0.001****
Gender								
Male	5	26.3	12	17.4	73	30.3		
Female	14	73.7	57	82.6	168	69.7	14.979	**0.001****
Educational level								
Bachelor of Nursing	7	36.8	25	36.2	109	45.2		
Technical institute of nursing	2	10.5	31	44.9	84	34.9		
Secondary school nursing diploma	10	52.6	13	18.8	48	19.9	15.306	**0.004***
Marital status								
Single	6	31.6	29	42.0	66	27.4		
Married	13	68.4	40	58.0	175	72.6	5.414	0.066
Residence								
Rural	13	68.4	45	65.2	158	65.6		
Urban	6	31.6	24	34.8	83	34.4	0.071	0.965
Years of nursing experience								
< 5	19	100.0	58	84.1	93	38.6		
5 – 10	0	0.0	7	10.1	64	26.6		
> 10	0	0.0	4	5.8	84	34.9	63.950	**0.001****

Table (8): Correlation between the nurses' personality traits dimensions and their perception of artificial intelligence as well as innovative work behaviors (No.=329)

Personality traits dimensions	Perception of artificial intelligence		Innovative work behaviors	
	r	p	r	p
Extraversion	0.131	0.017*	0.302	0.001**
Agreeableness	0.169	0.002**	0.342	0.001**
Conscientiousness	0.157	0.003**	0.427	0.001**
Neuroticism	-0.151	0.006*	-0.342	0.001**
Openness	0.133	0.016*	0.416	0.001**

Table (1): Shows that about 73.3%of the nurses belong to age group average of 21 to 30 years with mean age is 29.2 ± 3.8, additionally 72.6% of them are females, regarding to their educational level, 42.9% of them have bachelor degree of nursing, furthermore 69.3% of them are married, and 65.7% living in rural areas, finally 51.7 % of them have less five years of nursing experience.

Figure (1): Displays that 24% and 23.4% of nurses are working in Liver University Hospital followed by Pediatric and Gynecology University Hospital, and 19.8% of nurses are working in Mental Health and Addiction Treatment Hospital, whereas 17.3% and 15.5% are working at Emergency University Hospital and Renal & Urology University Hospital respectively.

Table (2): Clarifies that the highest mean scores of nurses are for conscientiousness traits with 14.4±3.0, followed by openness and agreeableness personality with (13.2 ±3.3 and 13.2±2.2) respectively.

Table (3): Represents that the nurses' perception of AI knowledge and advantages dimensions is moderate and high with the percentage ranges between 40.7% to 44.1%. While, the studied nurses' perception of AI problems in health care is within moderate level 45.6%.

Figure (2): Reveals that 45% and 40.1% of the nurses have a moderate and a high level of AI perception respectively.

Table (4): Mentions depicts that nurses have a good response level to all dimensions of IWB ranged from 72.0%:74.1%.

Figure (3): Shows that 73.3% of nurses have a good response level to IWB.

Table (5): Explains that there is a significant relation between the nurses' age and their conscientiousness, neuroticism and openness personality trait dimensions, while there is a significant relation between the nurses' gender as well as education level with neuroticism and extraversion personality trait dimensions. While there is a significant relation between marital status and conscientiousness personality trait dimension. Also, the same table presents that there is statistically significant relation between residence and all dimensions of personality trait except extraversion dimension, however there is statistically significant relation between years of nursing experience and all dimensions of personality trait.

Table (6): Illustrates that there is a highly statistically significant association between nurses' age, educational level, years of nursing experiences and their perception of artificial intelligence.

Table (7): Demonstrates that there is a highly statistically significant association between nurses' age, gender, educational level, years of nursing experiences, and their innovative work behaviors.

Table (8): Explains that there is a significant positive correlation between nurses' total perception of AI and all dimensions of personality traits except the negative correlation for neuroticism dimension (r-0.151 with p value 0.006*). Also, the same table shows that there is a significant positive correlation between nurses' IWB and all dimensions of personality traits except the negative correlation for neuroticism dimension (r-0.342with p value <0.001**).

Discussion

AI is gradually transforming the landscape of healthcare, with its incorporation becoming widespread across multiple areas including patient care, diagnostics, and administrative duties **(Bohr & Memarzadeh, 2020).** As a result, an individual's inclination to utilize AI technology in certain areas of application could be influenced by numerous factors. **Park & Woo (2022)** who conducted a detailed study that identified several predictors of AI-powered application adoption: (1) personality traits, (2) psychological factors including inner motivation, self-efficacy, voluntariness, and performance expectation, and (3) technological factors such as perceived practicality, perceived ease of use, technology complexity, and relative advantage. So, the aim of the present study was to evaluate nurses' personality characteristics as a mediating factor between their views on artificial intelligence and their innovative work behaviors.

According to the current study, nearly three-quarters of nurses were in the 21–30 age range and were females. Furthermore, just two thirds of them were married, and lived in rural areas. These findings are in line with an Egyptian study conducted by **Abdelhakam et al., (2024)** who reported that, nearly half of nurses were females and aged less than 30 years 45 years, and nearly two-thirds live in rural areas. Also, agree with **Change et al., (2005**) who reported that the elevation of married nurses for social life transformation, amid secure job or economic pressures, advanced the job market.

Also, approximately half of the nurses had nursing education bachelor's degree, and had less than 5 years of nursing experience. This indicated that the nurse's selected career path in higher education affects her professional life and her reflections on analytical thinking skills. In agreement with **Wright et al., (2015)** who stated that the reasons for high attendance in nursing education related to emotional, social, and personal growth are embodied in the baccalaureate learner profile, which promotes skills of thought and creativity in educational experiences and social values within cultural contexts. This results are in consistent with **Abdelhakam et al., (2024)** who findings who reported that just half of them held a bachelor's degree in nursing, and the majority roughly three-fifths had between ten and twenty years of experience.

The results of the present research showed that conscientiousness personality trait had the highest mean score followed by agreeableness and openness personality. While extraversion and neuroticism personality traits have the least mean score among nurses. From the researchers' perception the nursing is a human job affected by the individuals' conscientiousness as well as the use of social media and the technology in nursing lead to agreeableness and openness personality

Several research findings could align with and consolidate these results, according to **Abdel-Azeem et al., (2024)** who reported that the highest number of the participants had strong conscientiousness, openness to experience, and agreeableness. Also, **Bataweel, (2023)** who explored that most of nurses had higher conscientiousness and agreeableness scores, which tallied well with the study results of **Masmouei et al., (2020**) who reported that the highest mean score of subjects was in conscientiousness and agreeableness. However, in contrast with **Abou**

Shahda et al., (2019), who reported that the highest mean scores of the participants were for those having neuroticism personality.

Regarding the nurses' perception of AI, more than three quarters of the nurses demonstrated a moderate and a high level of AI perception using in the health care, this reflects that nurses adopt the AI idea in health care delivering due to increase use of technology in health care settings and in nursing as the AI is become the topic of the era as well as the use of AI provide nurse with a lot of information and decrease error which finally increase quality of nursing care. These findings were consistent with **Jiang et al. (2017),** who mentioned that AI transports a change to healthcare powered by the aggregate availability of healthcare data and fast progress of analytics practices. Also, **Shameer et al. (2018)** who found that AI can develop a huge amount of data using a correct, quick, and effective technique by using multifaceted statistical and computing algorithms. Additionally, **Trivedi et al. (2018)** who asserted that AI can help in the establishing of precise diagnoses and suitable treatment plans, offer assistance on the best treatments for cancer, and conduct genome analyses. Also, **Vaananen et al., (2021)** who mentioned that the use of AI may prevent medication errors such as drug overdoses. Moreover, the current study finding has a moderate mean score as related to the perception of the application of AI in health care is 28.25 ± 3.050. This study is similar to the study of **Sabra et al., (2023),** who indicated that more than fifty nurses agreed that AI could improve the practice in health care, help to decrease the number of medical mistakes, and offer clinically relevant, high-quality data and agreed that they had high hopes about AI application in the health care settings, while they had good knowledge about AI.

Moreover, this result is congruent with **Möllmann et al., (2021),** who reported that most of the subjects consider AI to be beneficial in the medical field. Also, **Krittanawong (2018)** who mentioned that physicians were predictable that AI would be useful in diagnoses and in preparation for treatment by providing the latest clinically appropriate data and the growth of AI in healthcare will be pleasing for everyone in the healthcare team.

In addition, **Funk et al. (2020**) who stated that seventy-two percent of Singapore believed that the growth of AI has mostly been a worthy mechanism for society, and Japan considers that AI has an optimistic effect on society. In the same line, Egyptian study conducted by **Ahmed et al. (2022)** who found that nearly two-thirds of participants agreed that AI helps healthcare providers make daily to-do lists. Additionally**, Shinners et al. (2020)** who found that the application of computers in healthcare settings was affected by the experience, knowledge, and skill set of the users.

As regards the Innovative work behaviors, a majority of nurses (nearly two thirds) have highly innovative work behaviors. These results may be due to nurses who have a strong intrinsic motivation, passion for their work, and a desire to improve patient outcomes are more likely to engage in innovative behavior, also, may have to do with nurses rallying support for creative ideas and coming up with unique solutions to issues after assessing their usefulness. It may also be explained by the nature of the healthcare industry, as well as the fact that everyday nursing tasks and stressful situations that call for prompt resolutions cause nurses to feel pressured to come up with solutions. Furthermore, nurses constantly expend energy in order to fulfill their daily tasks, obligations, and responsibilities. As a result, people put forth effort and energy to think creatively in order to accomplish their objectives. These results supported with the study by **Ghonem & Abdrabou, (2023)** who reported that higher two thirds of subjects had high IWB.

Regarding association between nurses' personal data and their and their personality traits dimensions, this research showed that there was a significant relation between the nurses' age and their conscientiousness, neuroticism and openness personality trait dimensions, while there was a significant relation between the nurses' gender as well as education level with neuroticism and extraversion personality trait dimensions. While there was a significant relation between marital status and conscientiousness personality trait dimension. Also, there was statistically significant relation between residence and all dimensions of personality trait except extraversion dimension, however there was statistically significant relation between years of nursing experience and all dimensions of personality trait, from the researchers' perceptions the significant associations between nurses' personal data and their personality traits underscore the dynamic interplay of individual, professional, and environmental factors. These insights are valuable for tailoring nursing education, support systems, and workplace policies to enhance both personal development and professional performance

This finding of the research approved by **Wang et al., (2024)** they illustrated that personality traits, behavior styles, and emotional intelligence are key characteristics of health professionals and can influence their professional practice and career outcomes. Understanding these traits can help tailor nursing education, support systems, and workplace policies to enhance both personal development and professional performance.

Regarding association between nurses' personal data and their perception of AI. The current study revealed that there was a high significant association between age, educational level, years of nursing experiences and their perception of AI, this is might be the nursing younger age, as well as high educational level of nurse effect on nurses' use of technology that reflect on their AI.

Also, **Funk et al., (2020)** who discovered that older persons are more prone to reject the notion that a society's advancement in AI was beneficial. Additionally, according to **Elsayed & Sleem (2021),** there is a strong positive correlation between nurse managers' perceptions of AI use and their demographic features, including education and experience. These findings were in contrast with **Sabra et al., (2023)** who reported that, the results don't reveal any significant different between nurses' perception toward AI and their qualifications, experiences and work setting.

Regarding the association between nurses' personal data and their IWB. The current study results showed that there was a high significant association between age, gender, educational level and years of experiences of the studied nurses and innovative work behaviors. In the same line, **Elsayed et al., (2022)** who showed that there was a significant relation between innovation behavior level and personal as well as job characteristics of nurses.

Regarding the correlation between the personality traits dimensions and perception of AI; Overall, the findings concluded that the Big Five Personality traits "extraversion, agreeableness, conscientiousness, neuroticism and openness" all tend to predict significant association with perception of artificial intelligence, whether they are positive or negative. The nurses who scored highly on the extraversion, agreeableness, conscientiousness and openness trait had significant positive correlation to perception of AI; in contrast, those with high neuroticism scores showed more significant negative the perception of AI.

Conscientiousness. Findings of this study revealed that nurses who scored high in conscientiousness exhibited positive correlation toward the perception of AI. A possible explanation is that conscientious people are characterized by self -one explanation is that conscientious people are defined by self-control, a sense of obligation, and a drive for success. They also have a propensity to treat people and tasks seriously, which leads them to operate in a planned manner to guarantee that their goals are properly achieved. As a result, those with these traits might view the use of AI in hiring as a source of accuracy, dependability, and lack of prejudice, which would increase their level of acceptability. This result was in congruence with the findings of **Calluso & Devetag (2024)** who revealed that the personality attribute "conscientiousness" had a statistically significant impact, suggesting that those with high levels of this trait are more likely to favor the use of AI technologies in hiring.

Extraversion. Findings of our study showed that those who scored high in extraversion exhibited positive correlation toward AI. This may be explained by the fact that extraversion is defined by a propensity to be outgoing, upbeat, and proactive. In addition to being more likely to feel happy and view neutral objects favorably, extraverts also have a tendency to be highly active in social interactions. Additionally, **Park & Woo, (2024)** discovered that extraverted people were more likely to have favorable opinions on AI in general.

Openness. Findings are in line with other authors as **Kaya et al., (2024) & Park &Woo, (2022)** contend that people who score highly on openness are more likely to be flexible, curious, respectful of innovation, and open to new technologies all of which are indicators of positive perception of artificial intelligence.

Agreeableness. The results of our study are consistent with suggestions that agreeableness was a significant predictor of people's positive toward AI perception. In an explanation of such results studies argued that people with higher agreeableness scores such as etiquette, social skills, and willingness to compromise nature might be more able to withstand the positive effects of AI. This finding was not agreed with the finding of **Schepman & Rodway (2023),** stated that, agreeableness emerged as a significant predictor of negative AI attitudes.

Neuroticism is defined as the propensity to feel emotional negatives. People who exhibit high levels of neuroticism are more likely to be sensitive to threats and punishment. They frequently reject and are less receptive to new changes because of their propensity to withdraw and suppress behaviors in reaction to stimuli. Several researches such as **Sindermann et al. , (2022)**; **Park & Woo (2022) & Kaya et al. , (2024**) confirmed that, neuroticism consistently reported negative response for AI. Also, **Babiker et al., (2024)**, reported that, in the Arab sample, neuroticism was a significant predictor for negative AI**.**

Regarding the correlation between the personality traits and IWB. The results of this study indicated that four personality traits had a strong positive impact on innovative behavior, namely extraversion, agreeableness, conscientiousness, and openness. While, neuroticism had significant negative relation with innovative behavior. This finding aligns with **Nam and Hang (2024)**, found that three personality

traits influence creativity, extroversion, openness to experience, as well as conscientiousness had positive and good influence on creativity. On the other hand, **Woods et al., (2018),** the interaction between conscientiousness as well as IWB was significant but negative, however, the interaction between openness and IWB was not found significant.

Conclusion

This research concluded that**,** highest mean scores of nurses' personality traits were for conscientiousness traits. Moreover, under half of nurses had a moderate and a high level of AI perception. Also, approximately three quarters of nurses had a good response level to IWB. Additionally, there was a significant positive correlation between nurses' total perception of AI as well as nurses' IWB and all dimensions of personality traits except the negative correlation for neuroticism dimension.

Recommendations

- Hold training sessions and workshops by hospital administration, to foster a culture around the use of AI in healthcare settings as well as innovation in the work place.
- Develop targeted educational strategies and interventions that foster a positive attitude toward AI, ultimately benefiting both nurses and patients.
- Conduct training programs that emphasize on the benefits and practical applications of AI in nursing to alleviate fears and resistance, particularly among those with high neuroticism and conscientiousness.
- Conduct further research in the large sample to make the findings more applicable in different circumstances.
- Conduct further research to examine nurses' creative use of AI.

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