

Effect of Educational Program about Ambidextrous leadership for Nursing Managers on Entrepreneurial Orientation and Organizational Ingenuity

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Abstract

Ambidextrous leadership empowers organizations to excel in two seemingly opposite areas that set the stage for exploring how leaders can cultivate this duality and entrepreneurial orientation to drive success and ingenuity in a dynamic and competitive work environment. **Aim:** Assess the effect of educational program about ambidextrous leadership for nursing managers on entrepreneurial orientation and organizational ingenuity. **Methods:** A quasi experimental design was used in this study. **Setting:** The current study was carried out at Benha University Hospital in the Qalubia Governate of Egypt across all 36 units. **Sample:** All (105) nursing managers. **Tools of data collection:** Four tools were employed to gather data, namely: Ambidextrous leadership Knowledge Questionnaire, Ambidextrous leadership Practices Questionnaire, Entrepreneurial Orientation Questionnaire and Organizational Ingenuity Questionnaire. **Results:** The greatest percentage of them (89.52%) had sufficient knowledge about ambidextrous leadership at immediate post program phase, While less than three quarters of nursing managers had satisfactory level of practice at immediately post-program phase and follow up phase, less than three quarters of them had high entrepreneurial orientation level at immediately post-program implementation phases and the majority of nursing managers had reported a high level of organizational ingenuity at immediately post-program implementation phase. **Conclusion:** There was a highly statistically significant positive correlation among nursing managers' total knowledge, and practices regarding ambidextrous leadership and entrepreneurial orientation and organizational ingenuity at pre- program, immediately post and follow-up program phases. **Recommendations:** Hospital administrators should foster a culture of ambidexterity by incorporating periodic ambidexterity training for nursing managers at all levels.

Keywords: *Ambidexterity leadership, Entrepreneurial orientation, Nursing managers & Organizational ingenuity.*

Introduction:

In the dynamic, competitive, and increasingly unstable environment that we live in today. Today's health care organizations operate in an environment that is subject to both macro and micro changes. As such, they must constantly adjust to the opportunities and threats that come from the outside and respond to them creatively and structurally. It is argued that in these situations, a leader's style plays a major role in influencing the attitudes and behaviours of their workforce. Thus, there are good reasons to concentrate on how leadership practices impact health professionals, a need that requires ambidextrous leadership (Kousina, & Voudouris, 2023; Slatten, et al., 2023).

In order to obtain a good fit between management behaviours and complex conditions, ambidextrous leadership highlights that opposing leadership behaviours should be integrated into a bigger behavior system and that taking on several responsibilities can help; By their opening and

closing actions toward staff, ambidextrous leaders inspire staff to explore ideas and take calculated risks. They also help staff improve and put ideas into practice (Ouyang, et al., 2022). The ability to foster both explorative and exploitative behaviours in staff by increasing or reducing variance in their behavior and flexibly switching between those behaviours" is the definition of ambidextrous leadership. Ambidextrous leadership has positive influence at individual level, team level and organizational level (Jabeen, et al., 2023).

In order to handle tensions in the risk profile, time horizon, leader's responsibilities, and link to the current strategy that may arise from the external business environment, ambidextrous leaders must engage in intricate and cognitive processes that call for the adoption of integrative and contradictory thinking. Therefore, it has become necessary for leaders to possess a level of behavioral and cognitive complexity that allows them to perform numerous jobs at once. As a result, ambidextrous leadership

emerged as a new type of leadership (Al-Eida, 2020; Mutonyi, et al., 2024).

Ambidextrous leadership therefore comprises two components: opening and closing leadership behaviours. Opening leader behaviours are ones that encourage exploration and risk-taking, which allows staff members to think and act independently. They also promote staff members' attempts to question established routines and methods, which increases variation in follower behaviour (Mascareno, et al., 2021). Contrarily, closing leadership behaviours lessen the diversity in follower behavior through enforcing corrective measures, penalizing mistakes, establishing clear boundaries, and keeping track of goal accomplishment. Closing behaviours hence encourage staff members to act exploitatively. These behaviours require temporal flexibility, which is the capacity of the leader to alternate between opening and closing behaviours in response to the exigencies of the circumstance (Akinci, et al., 2022).

Staff members are among the many areas of an organization that are impacted by ambidextrous leadership. The majority of us have undoubtedly encountered "good" or "bad" leadership practices at some point. These experiences can have a positive or negative impact on our thoughts, feelings, and behaviours as well as our capacity for entrepreneurship. They can even have an effect on how well we perform at work in terms of productivity, creativity, and service quality. It is evident that health care organizations must comprehend the significance of leadership practice (Slatten, et al., 2023).

Likewise, in the face of today's fast global development and dynamic competitive situations, firms must be committed to engaging in entrepreneurial activities if they are to survive and grow. In order to cope with these uncertainties and instabilities, potential entrepreneurs are obliged to develop skills that will enable them to deal with the various constraints imposed by the management of their entrepreneurial activities (Zaki, et al., 2023). The notion of an entrepreneurial orientation is understood as a strategic stance distinguished by a strong dedication to taking risks, being innovative, and being proactive. (Ngouyamsa, 2021; Andre, 2024). Also, The techniques, procedures, and corporate decision-making that can lead an organization to launch new goods, technologies, markets, services, or alter current business models are known as entrepreneurial orientations (Zighan et al., 2022; Tumaku, & Agbeko, 2024).

The entrepreneurship is most commonly described with the concept of entrepreneurial orientation that has three-dimensional construct that was comprised of innovativeness, risk-taking and being proactive and

open to change to cease the coming opportunities, also confronting the competitors and making innovative strategies to maintain its market share, and finally have to ability to allow the staff to act independently with their own values and interests to the benefit of the organization (El-Makarem, & Mahmoud, 2023). The creation of novel products, services, or solutions is referred to as innovativeness. A desire to take action ahead of expectations for the future is known as proactiveness. Organizations that are willing to devote their resources in an uncertain climate are said to be taking risks (Sharippudin, et al., 2024; Apere, 2024).

In order to have a greater influence on proactiveness, autonomy, and creativity, entrepreneurial orientations place greater focus on developing an organizational culture that supports cooperative connections with staff and patients and has advantageous marketing, technological, and financial capabilities. Health care organization that embrace entrepreneurial orientations as a cultural characteristic are better equipped to take advantage of opportunities and organizational ingenuity because it helps them break through inertia and avoid being rigid in a fast changing environment (Zaki, et al., 2023).

Organizational ingenuity refers to an individual's capacity to perform both exploration and exploitation activities simultaneously, while maintaining a balance between them. This involves investing in a manner that enhances and aligns their activities with a flexible organizational structure, capable of achieving success and adapting to changing environmental requirements. The word ingenuity, also known as ambidexterity, has its roots in Latin and dates back to 1976. It refers to the ability of individuals working in the organization to perform different tasks simultaneously (Desouky, 2021; Marie, & Alshaher, 2022).

Organizational ingenuity is determined by the essential principles and practices of the organization; it is the manner in which the organization is redefining experience by creating and executing unconventional solutions. Organizational ingenuity depends on many dimensions as exploration, investing in opportunities and a flexible organizational structure. Exploration: refers to a behavior that involves consistently striving for improvement, making thoughtful choices, creating quality work, and ensuring that others are satisfied with the results of one's efforts within the context of their own work (Hameed, & Jamal, 2022).

Investing in opportunities: This behavior encompasses refinement, selection, production, efficiency, implementation, and achievement. It involves investing in opportunities and addressing the challenges that individuals face in their work. A

flexible organizational structure (reconfiguration): A non-hierarchical system of work procedures within an staff's department can provide greater flexibility in completing daily job tasks and enable quick responses to shifts and changes in the work environment. It is important to absorb various modifications without making fundamental changes that could cause the collapse of the system (Jamal, 2022; Abdullah, & Al-Zayadi, 2023).

Organizational ingenuity does not follow from the intelligence of many great ambidextrous and entrepreneurial leaders. This is frequently linked to an enterprising mindset and manner of carrying out tasks. Unless they come up with original ideas of their own, most entrepreneurs view their organizations as tools to carry out their ideas. They detest delegation and generally prefer subordinates who are enthusiastic about finding ways to carry out plans drafted at the top. Ultimately, this leads to an organization that is conventional in problem-solving and to central innovation, typically contained to the entrepreneur founder (Siqueira, and Honig, 2019; Aljumaiee, & Al-Harthy, 2021; Mohamed, 2023).

Significance of the Study:

Health care organizations are working hard to achieve excellence and distinction as the ideal tool, broader way and seeking to choose the optimal leadership style as ambidextrous leadership style to reach that position to confront those challenges and achieve their goals in light of the challenges that businesses are facing more and more, the emergence of the phenomenon of globalization, the intensification of competition between businesses at the local and international levels, the changing needs and desires of patients and staff, and the desire to improve market share and achieve organizational ingenuity (Tedla, & Hamid, 2022).

Ambidextrous leadership has gained considerable attention in the last two decades and increasing attention in research and practice, there are a handful of international and national studies which focused their attention on creating staff ambidexterity is becoming important components of successful management as Rosing, & Zacher, (2023) who observed in their German study that ambidextrous leadership's opening and closing behaviours had an impact on an organization's capacity for innovation. Another study in Egypt as El-Gazar, et al., (2020), who concluded that the ambidexterity training program was effective in increasing nursing managers' ambidexterity behavior, innovative behavior, and leadership competencies. Also, Ali, et al., (2023) who showed that there was a positive correlation between ambidextrous leadership behavior and career competencies. Additionally when the researchers

contact with nursing managers at Benha University Hospital during practical training of students at last year found that that they use traditional leadership styles and need to keep pace with development in using and applying advanced leadership skills as ambidextrous leadership that meet staff nurses needs in order to motivate them to use their talents and abilities, and treating them as an important human resource worthy of care, attention and respect, and consider them essential stakeholders in the health care organization together, to become more committed in the work environment and achieve high levels of performance and entrepreneurial orientation, so this study will be conducted to assess the effect of educational program about ambidextrous leadership for nursing managers on entrepreneurial orientation and organizational ingenuity.

Aim of the study

The study aims to assess the effect of educational program about ambidextrous leadership for nursing managers on entrepreneurial orientation and organizational ingenuity.

Research hypotheses:

After the program's implementation, nursing managers' knowledge and practice of ambidextrous leadership at work will improve, and this will have significant effects on their entrepreneurial orientation and organizational ingenuity.

Subjects and Methods

Research design

Quasi experimental design will be utilized in carrying out the study.

Setting:

The current study was carried out at Benha University Hospital in the Qalubia Governate of Egypt across all 36 units. All hospital units had a total of 600 beds available for use. The hospital is made up of three distinct structures; firstly, the Medical Building consists of 24 units (430 beds). Second, the Surgical Building consisted of 10 units (160 beds). And finally, the Ophthalmology Building included 2 units (10 beds).

Sample:

All (105) nursing managers including a nursing director, an assistant nursing director, supervisors, 36 head nurses, and 63 assistant head nurses, who were worked in the aforementioned study settings and available for work at the time of data collection.

Tools of data collection:

The data for this study were collected using the following four tools:

Ambidextrous leadership Knowledge Questionnaire

A questionnaire were developed by the researchers after reviewing related literature (Rashid, & Mozher, 2018; Al-Thalamim & Banna, 2020; Hassan, &

Alshaibani, 2021). It consisted of two main parts. **Part I:** Nursing managers' personal and job data including; (department, age, gender, marital status, years of job experience, job position, educational qualification, and attending educational courses about ambidextrous leadership). **Part II:** Ambidextrous Leadership Knowledge Test: To assess nursing managers' knowledge about ambidextrous leadership in their work throughout program phases, it included (40) questions categorized under six main domains: 1- The concept of ambidextrous leadership (5 questions), 2- Qualifications and competencies of ambidextrous leaders (6 questions), 3- The dimensions of ambidextrous leadership (7 questions), 4- Factors that affecting on ambidextrous leadership (5 questions), 5- Barreirs of ambidextrous leadership (7 questions), 6- Strategies on developing ambidextrous leadership successfully (10 questions).

The scoring system:

"One" was awarded for the right response to the inquiry, and "Zero" for an erroneous response or a state of ignorance. After being calculated, the mean and standard deviation were converted to percentages. 40 was the total score. (Ebraheem, et al., 2018)

- Adequate knowledge if score equal or more than 60% that represent (≥ 24 -40 scores).
- Inadequate knowledge if score less than 60% that represent (0-23 scores).

Ambidextrous leadership Practices Self Report Questionnaire:

After reviewing the relevant literature, the researchers developed questionnaire. (Hassan, & Alshaibani, 2021; Elkhateeb, 2022, Hamood, & Saheb, 2022) to assess ambidextrous leadership practices among nursing managers in their work throughout program phases. It contained of (35 items) categorized under two essential domains are as follows: 1- Open leadership practices (19 items), 2- Closed leadership practices (16 items).

Scoring system:

The replies from the nursing managers were evaluated using a three-point Likert scale. "Rarely" as (1). "Sometimes" as (2) and "Always" as (3). After calculating the mean and standard deviation and converting them into a percentage, the total score was 105. (Ebraheem, et al., 2018)

- Satisfactory ambidextrous leadership practices level if the percentage was $< 60\%$ which equals 1-62 scores.
- Moderate ambidextrous leadership practices level if percentage ranged from $60\% < 75\%$ which equals 63- 78 scores.
- Unsatisfactory ambidextrous leadership practices level if percentage was $\geq 75\%$ that equals ≥ 79 -105 scores.

Entrepreneurial Orientation Questionnaire

The researchers reviewed the relevant literature before developing the questionnaire (Ayoop, 2017; Abd Elhamed, 2023; El- Makarem, & Badawy, 2023) to assess entrepreneurial orientation as reported by nursing managers in their work place settings throughout program phases. It composed of (28 items) classified under five main domains as follows; 1- Creativity (8 items), 2- Proactiveness (4 items), 3- Taking risk (5 items), 4- Independence (5 items) and finally; Self Ability and desire for achievement (6 items).

Scoring system:

The replies from the nursing managers were assessed using a Likert scale with three points. The terms "rarely" (1), "sometimes" (2), and "often" (3) are used. After the results' conversion to a percentage and the computation of the mean and standard deviation. The total score was 84. (Mohamed, et al., 2019)

- Low level of entrepreneurial orientation if the percentage was less than 60%, which equals (1-50 scores).
- Moderate level of entrepreneurial orientation if the percentage ranged from $60\% < 75\%$ which equals (51-62 scores).
- High level of entrepreneurial orientation if the total percentage was $\geq 75\%$ equals (63-84 scores)

Organizational Ingenuity Questionnaire

After examining the relevant literature as (El Ouda, 2020; Ebraheem, et al., 2021; El Nafakh, 2023), the researchers developed the questionnaire to assess organizational ingenuity as reported by nursing managers in their work place settings throughout program phases. It composed of (23 items) categorized under three basic domains as follows; 1- Opportunities Exploration (9 items), 2- Opportunities Exploitation (10 items), and finally; Structural Ingenuity (4 items).

Scoring system:

The replies from the nursing managers were graded using a three-point Likert scale. The terms "rarely" (1), "sometimes" (2), and "often" (3) are used. After being computed, the mean and standard deviation were converted to percentages. 69 was the total score. (Mohamed, et al., 2019)

- Low organizational ingenuity level when the percentage was $< 60\%$ that equals (1-41 scores).
- Moderate organizational ingenuity level when ranging from $60\% < 75\%$ that equals (42-51 scores).
- High organizational ingenuity level when the total percentage was $\geq 75\%$ that equals (52-69 scores)

The validity and reliability of study tools:

The Validity:

A group of five experts in the field of nursing administration from various nursing faculties at different universities evaluated the study's

instruments to make sure they were clear, feasible, and applicable. These experts included two professors of nursing administration from Ain Shams University, one professor of nursing administration from Tanta University, one professor of nursing administration from Menofia University, and one professor of nursing administration from Benha University. Ultimately, changes were made in response to the insightful feedback from the experts, including changing a few words to clarify unclear passages and give them the best possible meaning.

The Reliability:

Each tool's reliability was found to be moderate to high using the Cronbach's Alpha Coefficient test as follows:

Tool Name	Internal consistency
I. Ambidextrous leadership Knowledge Questionnaire	(0.893)
II. Ambidextrous leadership Practices Self Report Questionnaire:	(0.887)
III. Entrepreneurial Orientation Questionnaire	(0.875)
IV. Organizational Ingenuity Questionnaire	(0.986)

The pilot study:

To evaluate the clarity, feasibility, objectivity, and practicability of the four questionnaires and to estimate the time required to fill them out, which varied from 40 to 60 minutes, a pilot study was conducted on ten nurse managers, or 10% of the overall study population. It was done in the beginning of November 2023. Since no changes were made, the pilot research was incorporated into the sample for the primary investigation.

The Field work:

The current study was conducted from the beginning of October 2023 to the end of May 2024, a period of around eight months.

The preparation phase:

- The researchers developed and constructed the study tools of data collecting and ambidextrous leadership educational program by reviewing current related literature and theoretical understanding of the many aspects concerning the issue of the study. Connecting nursing managers to tools that have been translated into Arabic in order to improve comprehension.
- The program's development was predicated on the needs' context, which was determined by baseline data obtained from the tools' final design. Furthermore, the program's formulation was informed by an evaluation of the ambidextrous leadership practices and understanding of nurse managers, which was conducted prior to the starting

of the educational program. together with a review of relevant literature. The ambidextrous leadership educational program was then developed using this information and the identified gaps.

The Ambidextrous leadership Educational Program:

These are the topics covered in the ambidextrous leadership educational program:

- The concept of leadership and ambidextrous leadership.
- Benefits of applying ambidextrous leadership on staff and organizations.
- Principles of the ambidextrous leadership.
- Qualifications and competences of ambidextrous leaders.
- The dimensions of ambidextrous leadership.
- Strategies on developing ambidextrous leadership successfully
- Factors that affecting on Ambidextrous Leadership
- Barriers and challenges of ambidextrous leadership and how to overcome these barriers.
- Relation between ambidextrous leadership, organizational ingenuity and entrepreneurial orientation
- The preparation and design of the ambidextrous leadership educational program for nursing managers began with the goal of giving them the chance to advance their knowledge of and practice of ambidextrous leadership. This was accomplished through the phases of assessment, planning, implementation, and evaluation.

Assessment Phase:

- The researchers met with the nursing managers and went over the purpose, design, and methodology of the study as well as how the questionnaires should be completed. Either individually or in small groups, this was accomplished. Additionally, the nursing managers were divided into six groups based on the location of their departments: (3 groups) each group contained 17 nursing managers and (3 groups) each group contained 18 nursing managers.
- In order to secure their support and assure the continuity of patient care, the researchers gave the questionnaires to the participating nursing managers prior to the educational program's implementation in December 2023. They were asked to complete them during their morning and afternoon shifts, which were predetermined by the head of each department based on the nature of the work and their workload.

The Planning Phase

- The educational program was constructed to enhance nursing manager's knowledge and practice regarding ambidextrous leadership based on baseline data gathered during the pre-test program

phase and study of relevant literature in the form of published Arabic guidebooks. It took about three weeks at January 2024.

The Implementation Phase

- The program was implemented at Benha University Hospital in the previously mentioned study setting. At the end of January 2024, it was put into effect. Thirty hours were required to accomplish the program's aim. 30 hours of the 15-day instructional program were divided into 15 sessions, 2 hours each, and 3 days per week.
- The ambidextrous leadership educational program was carried out independently by each researcher with one group during the day, utilizing the tools at hand, relevant material, and teaching techniques for each session. A variety of instructional techniques, including lectures, brainstorming sessions, small group discussions, and group activities, were used. Power point presentations and a handbook that the researchers developed and gave to all nursing managers on the first day of the educational session were among the instructional materials/teaching aids used.
- Different methods of evaluation were chosen to meet the needs of the nursing managers and accomplish the goals and contents of the ambidextrous leadership educational program. Feedback was given at the beginning of each session regarding the previous one and at the end of each session regarding the current sessions.

The Evaluation phase.

- Before the sessions, a pre-test was given. Nursing managers completed the pre-test in the presence of researchers after being informed about the aim and design of the study. Both right after the educational program was put into place and three months later during the follow-up phase, an immediate post-test was given.
- The evaluation phase has a strong emphasis on assessing how an educational program in ambidextrous leadership affects the knowledge and practices of nursing managers, as well as their entrepreneurial orientation and organizational ingenuity.

Ethical considerations:

- The scientific research ethical committee of the Sohag University Faculty of Nursing gave ethical approval prior to the study's conduct.
- After outlining the aim of the study, the director of Benha University Hospital received a formal letter from the dean of the Faculty of Nursing at Benha University requesting permission to undertake the research
- Before beginning the data collection, each nursing manager was given information about the aim,

design, and advantages of the study. A consent was then sought. Throughout the whole study, confidentiality was maintained. Each nursing manager was advised of their ability to refuse or withdraw from the study at any time without providing a reason, and they were reassured that all data would only be utilized for research.

The Statistical design:

Before being entered into the computer, the data were verified. Data tabulation and analysis followed, using the Statistical Package for Social Sciences (SPSS version 20) for that purpose. Descriptive statistics were employed, including percentages, means, standard deviations, and frequencies. With the use of significance tests (paired t-test and Chi-square), the study hypothesis and the homogeneity of the outcome variables between the groups were examined. Pearson correlation coefficients were used. A statistically significant difference was defined as P-value $P < 0.05$, and a highly statistically significant difference as P-value $P \leq 0.001$.

Results:

Table (1): Frequency distribution of the nursing managers' personal and job data (N=105).

The personal and job data	Total (N=105)	
	N	%
Department/unit		
Medical	76	72.4
Surgical	25	23.8
Ophthalmology	4	3.8
Age		
25- < 35	22	21.0
35- < 45	25	23.8
45 - < 55	53	50.4
55-58	5	4.8
Mean and ±S.D.	43.74±10.865	
Gender		
Male	22	21
Female	83	79
Marital status		
Married	89	84.8
Unmarried	16	15.2
Years of job experience		
< 10	24	22.9
10< 20	59	56.1
≥ 20	22	21.0
Mean±S.D.	14.9±7.98	
Job position		
Nursing director	1	0.95
Assistant nursing director	2	1.90
Supervisor	4	3.81
Head nurse	36	34.29
Assistant head nurse	62	59.05
Educational qualification		
Secondary nursing education	10	9.5
Technical nursing education	60	57.1
Bachelor of nursing	22	20.9
Post graduate nursing education (Master)	9	8.6
Post graduate nursing education (Doctorate)	4	3.9
Attending educational courses about Ambidextrous leadership in your workplace		
Yes	16	15.24
No	89	84.76

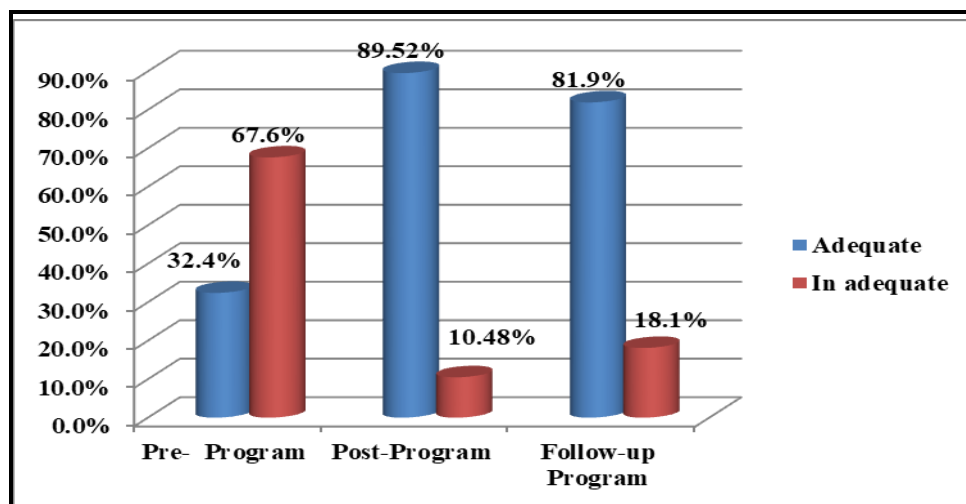


Figure (1): Percentage distribution of nursing managers' knowledge total levels about ambidextrous leadership throughout program phases.

Table (2): Mean scores and mean percent of the nursing Managers' Knowledge about Ambidextrous Leadership domains. Pre, post and follow-up program (N=105)

Domain	Mini/Maxi Score	Pre Program		Post Program		Follow-up Program		t1 P-Value	t2 P-Value	t3 P-Value
		Mean±S.D.	Mean %	Mean±S.D.	Mean %	Mean±S.D.	Mean %			
The concept of Ambidextrous Leadership	5	1.76±1.98	35.20	4.84±2.92	96.87	4.27±2.78	85.36	24.27 0.001	11.13 0.407	18.21 0.001
Qualifications and Competences of Ambidextrous Leaders	6	2.24±1.25	37.26	5.75±2.87	95.88	5.11±2.78	85.17	22.78 0.001	9.29 0.136	19.62 0.001
The dimensions of Ambidextrous Leadership	7	2.27±1.20	32.47	6.71±2.94	95.86	5.54±2.88	79.12	21.37 0.001	10.62 0.213	17.41 0.001
Factors Affecting on Ambidextrous Leadership	5	1.09±1.09	21.74	4.95±2.99	98.98	4.46±2.48	89.13	19.73 0.001	10.28 0.098	15.29 0.001
Barriers of Ambidextrous Leadership	7	2.33±1.10	33.29	6.71±2.97	95.87	5.76±1.22	82.29	20.67 0.001	11.74 0.097	18.62 0.001
Strategies on developing ambidextrous leadership successfully	10	3.33±2.25	33.26	9.69±3.66	96.89	8.41±3.16	84.14	19.16 0.001	11.46 0.312	15.37 0.001
Total	40	13.01±4.65	32.53	38.65±7.48	96.64	33.54±5.46	83.87	25.29 0.001	12.51 0.462	20.43 0.001

(A statistical significant difference $P \leq 0.05$ & A highly statistical significant difference $P \leq 0.001$)

(t1): Paired t test between pre & post program

(t2): Paired t test between post & follow-up program

(t3): Paired t test between pre & follow-up program

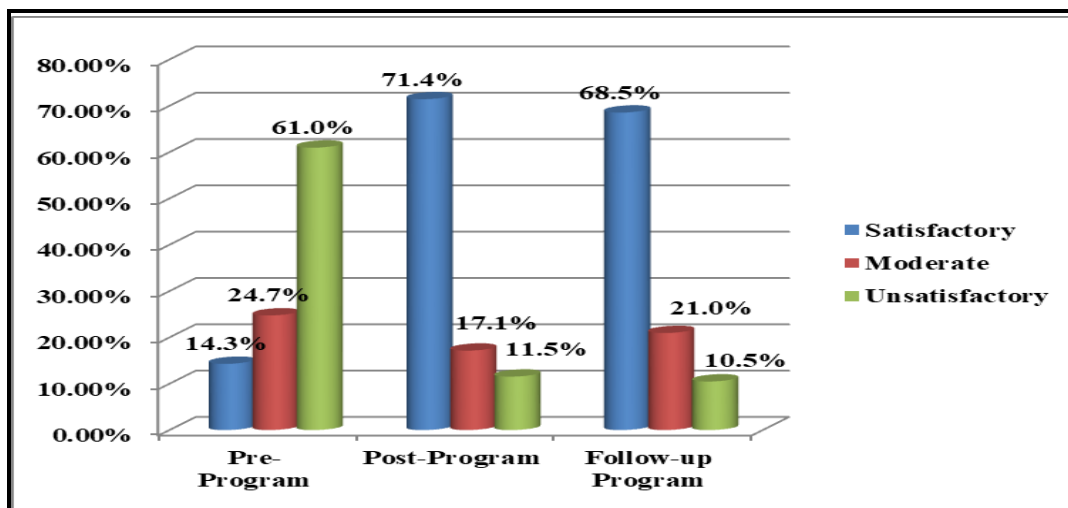


Figure (2): Percentage distribution of nursing managers' practice regarding ambidextrous leadership total levels throughout program phases.

Table (3): Mean scores and mean percent of nursing managers' ambidextrous leadership practice domains throughout program phases (n=105).

Domain	Mini/Maxi Score	Pre Program		Post Program		Follow-up Program		t1 P-Value	t2 P-Value	t3 P-Value
		Mean±S.D.	Mean %	Mean±S.D.	Mean %	Mean±S.D.	Mean %			
Open Leadership behaviours	19-57	19.56±3.78	34.32	52.65±5.77	92.37	48.00±4.78	84.21	25.92 0.001	11.89 0.231	20.98 0.001
Closed Leadership behaviours	16-48	19.53±5.79	40.68	41.63±6.14	86.72	38.55±5.78	80.32	21.12 0.001	10.34 0.46	18.97 0.001
Total	35-105	39.09±5.48	37.23	94.28±3.22	89.79 ±4.77	86.55±4.78	82.43	35.76 0.001	12.46 0.341	30.32 0.001

(A statistical significant difference $P \leq 0.05$ & A highly statistical significant difference $P \leq 0.001$)

(t1): Paired t test between pre & post program

(t2): Paired t test between post & follow-up program

(t3): Paired t test between pre & follow-up program.

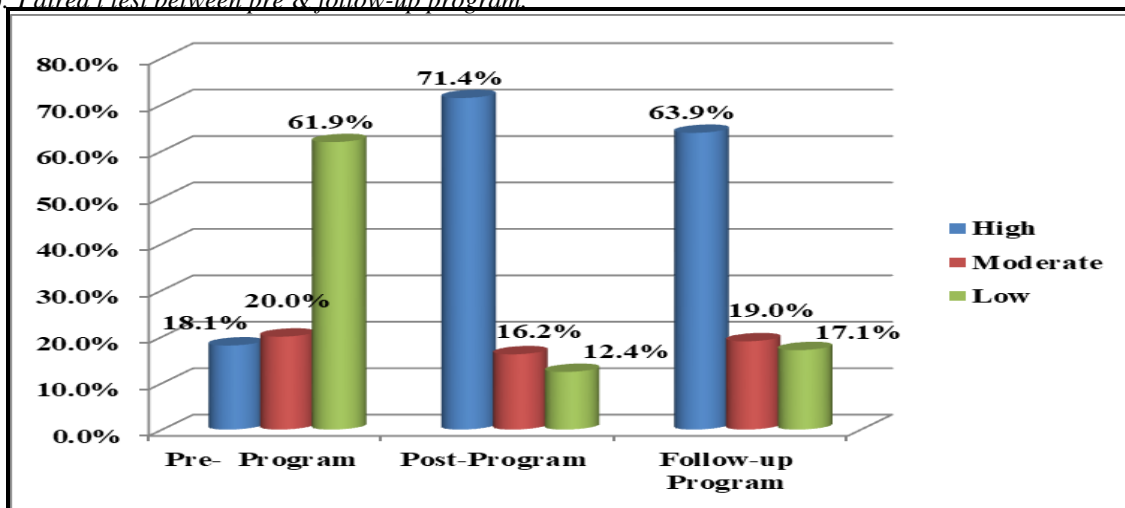


Figure (3): Percentage distribution of nursing managers' entrepreneurial orientation total levels throughout program phases.

Table (4): Mean scores and mean percent of nursing managers' entrepreneurial orientation domains throughout program phases (n=105).

Domain	Mini/Maxi Score	Pre Program		Post Program		Follow-up Program		t1 P-Value	t2 P-Value	t3 P-Value
		Mean±S.D.	Mean %	Mean±S.D.	Mean %	Mean±S.D.	Mean %			
Creativity	8-24	8.46±2.78	35.26	22.35±3.78	93.12	21.01±5.78	87.56	31.04 0.001	12.83 0.354	26.28 0.001
Proactiveness	4-12	4.87±1.02	40.59	10.82±4.72	90.13	10.24±3.33	85.34	27.81 0.001	11.09 0.572	24.36 0.001
Taking risks	5-15	5.98±2.79	39.87	13.07±4.40	87.12	12.34±3.71	82.26	23.63 0.001	10.29 0.316	21.37 0.001
Independence	5-15	6.32±1.74	42.12	12.02±4.73	80.14	11.14±3.56	74.26	25.87 0.001	10.46 0.312	22.46 0.001
Self-Ability and desire for achievement	6-18	7.36±1.95	40.89	14.60±4.33	81.12	13.71±5.20	76.14	21.79 0.001	9.46 0.279	18.62 0.001
Total	28-84	32.99±3.78	39.28	72.86±7.89	86.73	68.44±5.86	81.47	36.67 0.001	13.51 0.462	32.28 0.001

(A statistical significant difference $P \leq 0.05$ & A highly statistical significant difference $P \leq 0.001$)

(t1): Paired t test between pre & post program

(t2): Paired t test between post & follow-up program

(t3): Paired t test between pre & follow-up program.

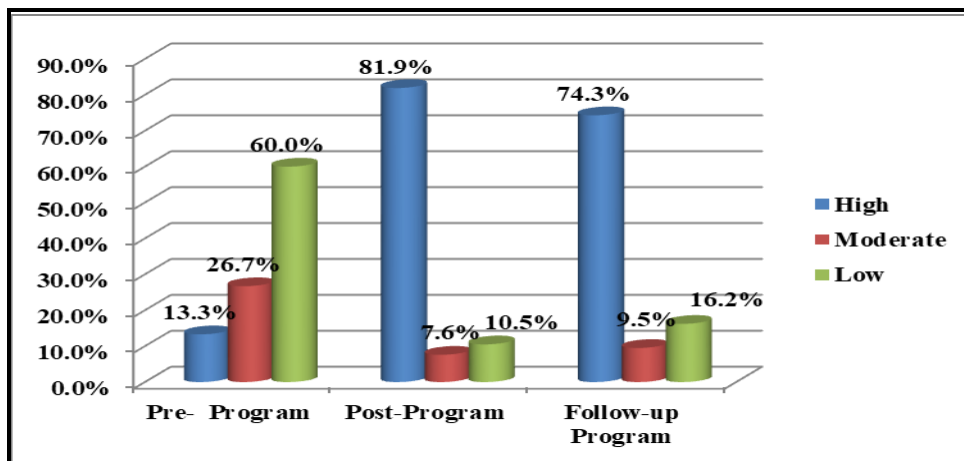


Figure (4): Percentage distribution of the organizational ingenuity total levels as reported by nursing managers' throughout program phase

Table (5): Mean scores and mean percent of organizational ingenuity dimensions as reported by nursing managers throughout program phases (n=105).

Domain	Mini/Maxi Score	Pre Program		Post Program		Follow-up Program		t1 P-Value	t2 P-Value	t3 P-Value
		Mean±S.D.	Mean %	Mean±S.D.	Mean %	Mean±S.D.	Mean %			
Opportunities Exploration	9-27	10.44±3.18	38.67	24.78±5.79	91.76	23.28±4.18	86.24	20.36 0.001	10.27 0.572	18.34 0.001
Opportunities Exploitation	10-30	12.54±2.48	41.79	26.24±3.68	87.48	24.11±3.19	80.36	19.89 0.001	11.29 0.316	14.62 0.001
Structural Ingenuity	4-12	5.03±1.78	41.89	10.42±4.70	86.86	9.75±2.77	81.23	18.37 0.001	9.46 0.312	15.16 0.001
Total	23-69	28.00±4.72	40.59	61.44±7.18	89.05	57.14±6.79	82.81	25.29 0.001	13.51 0.462	22.43 0.001

(A statistical significant difference $P \leq 0.05$ & A highly statistical significant difference $P \leq 0.001$)

(t1): Paired t test between pre & post program (t2): Paired t test between post & follow-up program

(t3): Paired t test between pre & follow-up program

Table (6): Correlation matrix among nursing managers' ambidextrous leadership knowledge & practice, entrepreneurial orientation and organizational ingenuity throughout program phases

Variable	Program phases	Ambidextrous leadership knowledge		Ambidextrous leadership activities/practice		Entrepreneurial orientation		Organizational ingenuity	
		r	P value	r	P value	r	P value	r	P value
		Pre-program							
Ambidextrous leadership knowledge		1	----	0.242	0.595	0.179	0.467	0.163	0.427
Ambidextrous leadership activities/ practice		0.242	0.595	1	----	0.191	0.142	0.264	0.461
Entrepreneurial orientation		0.179	0.467	0.191	0.142	1	----	0.114	0.248
Organizational ingenuity		0.163	0.427	0.264	0.461	0.114	0.248	1	----
Post-program									
Ambidextrous leadership knowledge		1	----	0.736	0.003	0.862	0.000	0.324	0.000
Ambidextrous leadership activities/ practice		0.736	0.003	1	----	0.621	0.003	0.572	0.000
Entrepreneurial orientation		0.862	0.000	0.621	0.003	1	----	0.419	0.000
Organizational ingenuity		0.324	0.000	0.572	0.000	0.419	0.000	1	----
Follow-up									
Ambidextrous leadership knowledge		1	----	0.597	0.000	0.549	0.000	0.413	0.000
Ambidextrous leadership activities/ practice		0.597	0.000	1	----	0.510	0.000	0.443	0.003
Entrepreneurial orientation		0.549	0.000	0.510	0.000	1	----	0.642	0.003
Organizational ingenuity		0.413	0.000	0.423	0.003	0.642	0.003	1	----

Table (1): Demonstrates that fewer than three quarters (72.4%) of studied nursing managers' were working at medical department and slightly more than half (50.5 %) of them aged ranged between 45 and under 55 years old with Mean and ±S.D 43.74±10.865 years. In addition, greater than three-quarters (79.0%) most of them were female and the majority (84.8 %) of them were married. As regard years of experience nearly to three fifth (56.2%) of them had from ten to less than twenty years. of experience with Mean and ±S.D 14.9±7.98 years and slightly less than three fifth (59.05 %) of them were assistant head nurse. In relation to their Educational qualification three fifth (60.95%) of them had technical nursing education. As far as attending educational courses about ambidextrous leadership in their workplace the majority (84.76 %) of them did not attend educational courses

Figure (1): Shows that there was a highly significant improvement in nursing managers' total knowledge levels about ambidextrous leadership following intervention both post and follow-up phases of educational program than the preprogram phase. More than two thirds of nursing managers (67.6 %) had inadequate knowledge about ambidextrous leadership at pre-program phase. While the greatest percentage of them (89.52%) had sufficient knowledge about ambidextrous leadership at immediate post program phase.

Table (2): Indicates that the mean score of nursing managers' knowledge about ambidextrous leadership domains at immediately post-program implementation phase improved (38.65±7.48) in contrast to the pre program (13.01±4.65). However, a slight mean decline (33.54±5.46) occurred during follow-up phase.

In addition, the table demonstrates that, at the pre-program phase, that there was a highly statistically significant improvement in nursing Managers' total knowledge in relation to strategies on developing ambidextrous leadership successfully (3.33 ± 2.25) and it increased to (9.69 ± 3.66) at immediately post-program implementation phase while it was decreased (8.41 ± 3.16) at follow-up phase of the program but still higher than pre program phase.

Figure (2): Demonstrates that there was a highly significant improvement in nursing managers' total practice levels regarding ambidextrous leadership after implementation of both post and follow-up phases after three months of program. Moreover, the minority of nursing managers' (14.3 %) had satisfactory practice level at pre-program implementation phase. While less than three quarters (71.4% & 68.5%) of nursing managers had satisfactory level of practice at immediately post-program phase and follow up phase respectively

Table (3): Indicates that there was improvement in mean scores (4.28 ± 3.22 - 86.55 ± 4.78 & 39.09 ± 5.48) of nursing managers' ambidextrous leadership practice at immediate post-program and follow up respectively.

Additionally, the table demonstrates that there was a highly statistically significant improvement in nursing managers' total scores of ambidextrous leadership practice in relation to total open leadership behaviours (19.56 ± 3.78) at pre program phase and it increased to (52.65 ± 5.77) at immediate post program implementation phase while it was declined (48.00 ± 4.78) at follow up phase of the educational program but still more than pre-program.

Figure (3): Illustrates that there was a highly improvement in nursing managers' entrepreneurial orientation total levels after intervention for both post and follow up implementation phases. Slightly less than two thirds of nursing managers (61.9 %) had low entrepreneurial orientation level at pre-program phase. While less than three quarters of nursing managers (71.4 %) had high entrepreneurial orientation level at immediately post program implementation phases.

Table (4): Shows that there was improvement in total mean score (72.86 ± 7.89 - 68.44 ± 5.86 & 32.99 ± 3.78) respectively of nursing managers' total entrepreneurial orientation levels at immediate post program and follow up phases in contrast to the pre - program phase.

In addition to, the table shows that there was a highly statistically significant improvement in nursing managers' total entrepreneurial orientation scores in relation to creativity (8.46 ± 2.78) at pre- program phase and it improved to (22.35 ± 3.78) at immediate post program implementation phase while it was

decreased to (68.44 ± 5.86) at follow up phase of the program but still more than pre-program phase.

Figure (4): Shows that there was a highly significant improvement in organizational ingenuity total levels as reported by the studied nursing managers' for both post and follow up phases. Moreover, the minority of nursing managers (13.3 %) reported high level of organizational ingenuity at pre-program implementation phase. While the majority (81.9%) of nursing managers had reported high level of organizational ingenuity at immediately post-program phase. In addition to almost less than three quarters of them (74.3%) had reported a high level of organizational ingenuity at follow up phases phase

Table (5): Displays that there was an improvement in total mean score (61.44 ± 7.18 - 57.14 ± 6.79 & 28.00 ± 4.72) respectively of organizational ingenuity as reported by the studied nursing managers at immediate post program and follow up implementation phases as in contrast the pre -program phase.

Moreover, the table indicates that the overall organizational ingenuity scores, as reported by the nursing managers under study, improved significantly in terms of opportunities exploitation (12.54 ± 2.48) during the pre-program phase and further improved to (26.24 ± 3.68) during the immediate post-program implementation phase. During the program's follow-up phase, the scores decreased to (24.11 ± 3.19), but they were still higher than during the pre-program phase.

Table (6): Demonstrates that during the pre-program, immediate post-program, and follow-up program phases, there was a highly statistically significant positive correlation between nursing managers' overall knowledge and practice related ambidextrous leadership, entrepreneurial orientation, and organizational ingenuity. This indicates that as nursing managers gained more experience and understanding of ambidextrous leadership, their degree of entrepreneurial orientation also improved, and as a result, their organizational ingenuity improved.

Discussion:

Healthcare organizations are currently undergoing a period of significant transformation due to unforeseen advancements in technology and changing societal demands. As a result, it is imperative for healthcare leaders, especially nursing managers, to strike a balance between pursuing new ideas and improving existing services to ensure that high-quality care is delivered. This balance can be achieved through the concept of ambidexterity, which involves exploiting existing competencies while also exploring new opportunities and coordinating them in a flexible

manner (El-Gazar et al., 2020). Entrepreneurial orientation represents the leadership vision and guides the internal efforts required for creating breakthroughs that promote and utilize staff creativity and innovation for the organization's long-term ingenuity, success, and growth generate value for customers and the organization that services them (Kalamaki et al., 2021 & Sturm, et al., 2023).

The results of this study showed that, compared to the pre-program phase, there was a highly significant improvement in nursing managers' overall knowledge levels regarding ambidextrous leadership following intervention, both in the post and follow-up phases after three months of program. More than two thirds of nursing managers had inadequate knowledge about ambidextrous leadership at pre-program phase. While the majority of them percent of them had sufficient knowledge about ambidextrous leadership at immediate post program phase.

From the researchers' point of view, this decline might be explained by a decrease in facts and information over time, emphasizing the necessity of routinely updating and refreshing knowledge. Additionally the effectiveness of the program in enhancing and improving ambidexterity knowledge and behaviours may be attributed to several factors, including the voluntary participation of the nursing managers, which may have increased their feeling of freedom to learn. The researchers also emphasized the importance and benefits of the program during the first session, which may have increased their curiosity to learn and engagement in the program. Additionally, the training program utilized various learning methods, such as case studies and participants' past experience situations, which may have enhanced the participants' understanding of the training content. Furthermore, all organizations that must endure in the digital era—public ones especially—should identify and nurture ambidextrous leaders who can strike a balance between exploration and exploitation, exhibit alignment and flexibility, and inspire their staff to be both productive and self-improved

The results of this study were consistent with those of El-Gazar et al. (2020), who showed that their ambidextrous leadership training program improved nursing managers' long-term ambidexterity knowledge. When comparing the follow-up evaluation to the post-training evaluation, a small mean decline was noticed.

In addition, these findings were consistent with Ma et al., (2018) who reported the effectiveness of their training programs in transferring and enhancing knowledge regarding ambidextrous leadership among healthcare workers. Similarly, Sender (2015) who found in his study that there was an improving in their

participant ambidexterity knowledge level after implementing the program.

Furthermore, the results of this study showed that, in comparison to the pre-program phase, there was an improvement in the mean score of nursing managers' knowledge on ambidextrous leadership domains at the immediate post-program implementation phase. The follow-up phase did see a small mean decline, but it was still greater than before the program. Furthermore, there was a highly statistically significant improvement in the overall knowledge of nursing managers regarding strategies on developing ambidextrous leadership successfully; this increased during the program's immediate post-implementation phase and decreased but still significantly more than before-during the program's follow-up phase.

In the same line, Alghamdi, (2018) who found in his study that a statistical significant improvement in participants' knowledge related to ambidexterity after receiving the training program at different stages of the study, with a large effect size. a significant increase in participants knowledge immediately after training completion compared with pre-training with p value, and this improvement was maintained at follow up program conduction. The results showed also a decline in the participants' knowledge mean score from post to follow up stage.

The results of this study showed that, after three months of program, there was a highly significant improvement in the overall practice levels of nursing managers of ambidextrous leadership. This improvement was seen in both the post-intervention and follow-up phases. Furthermore, during the pre-program phase, a minority of nursing managers possessed an adequate degree of practice. In contrast, at the follow-up and immediately post-program implementation phase, less than three quarters of nursing managers had a satisfactory practice level.

From the researchers' point of view, this might have to do with providing nursing managers with the proper training, offering refresher courses and other forms of support, and making sure that a positive training environment promotes the acquisition of information and skills. In addition to the leader who takes on a caretaker role and is focused on daily operations, the supervisor of nurses' abilities and skills strives to be a positive motivator to their staff nurses in order to achieve their unit goals and achieve the best nursing care for the patients. However, in some circumstances, the organization's rules, regulations, and work environment control the supervisors' behaviours with their staff nurses. As a result, the supervisor may decide to act alone in an emergency or other critical situation without consulting the nurses.

This result was confirmed by **Ali, et al., (2023)** who illustrated that more than half of nursing leaders exhibited "moderate" satisfactory level of ambidextrous leadership behavior and practices, followed by more than quarter of them exhibited "high" level. Furthermore, the minority of them were "low" level of ambidextrous leadership behavior and practices. Similarly, **Cai et al. (2023)** who showed that more than fifty percent of the nursing leaders exhibited a moderate degree of ambidextrous leadership behavior and practices.

Additionally, **Malik et al. (2017)** who emphasize the role of training in creating and sustaining an ambidextrous context for healthcare professionals. Noteworthy, while the follow-up evaluation scores were higher than the pre training scores, there was a slight decline in the mean scores during the follow-up evaluation when compared to the post-program scores. This indicates the need for periodic training to sustain and reinforce the improvement in ambidexterity behaviours among nursing managers.

In this respect, **Slatten et al., (2023)** who concluded that the job-directed performance of health professionals can be supported by both ambidextrous leadership and staff ambidexterity. Consequently, as a practical application of the findings, healthcare organizations should select, nurture, and educate their executives to become ambidextrous leaders. Nursing leaders ambidexterity and the quality of the services provided will both be directly impacted by doing this. Additionally, developing ambidextrous leadership skills can increase the quality of care that health professionals provide, positively change staff

Furthermore, at the immediate post-program and follow-up, respectively, there was an improvement in the mean scores of nursing managers' ambidextrous leadership practice. Additionally, there was a highly statistically significant improvement in the overall scores of ambidextrous leadership practice among nursing managers in relation to all open leadership behaviours. This improvement occurred immediately following program implementation and decreased (but still significantly more than pre-program) during the program's follow-up phase.

This result of the current study was in accordance with **Zheng, et al., (2023)** who reported that the mean score of participants' ambidextrous leadership competences and practices post-training showed an improvement than that of pre-training and this improvement was significant. Additionally, the mean score of participants' leadership competences in follow up is higher than that of pre-training and this improvement was significant. However, the participants mean scores in follow up stage decreased by than post training stage. Also this result was matched with **El-Gazar, (2020)** who reported that a

significant improvement in ambidexterity behaviours and practices mean scores among nursing managers, as evidenced by the higher mean scores in the immediately post and follow-up evaluations compared to the pre intervention.

Regarding entrepreneurial orientation total levels of nursing managers' throughout educational program phases, the findings of the current study illustrated that there was a highly improvement in nursing managers' entrepreneurial orientation total levels after intervention for both post and follow up implementation phases after three months of program. During the pre-program phase, little less than two thirds of nurse managers had a low level of entrepreneurial orientation. Upon implementing the program, less than three quarters of nursing managers shown a high level of entrepreneurial orientation.

From the researchers' point of view this may be related to training of nursing managers appropriately, provision of refresher education, training and support that ensuring good training environment facilitates acquisition of skills and knowledge. Also, supporting nursing managers' innovation and creative processes in the clinical setting. in addition to, this may be due entrepreneurial orientation represents the leadership vision and guides the internal efforts required for creating breakthroughs that generate value for customers and the organization that services them. Healthcare entrepreneur is a unique combination of innovation and healthcare communication that is essential for enhancing health, economic growth, and sustainable development.

The current study's findings were consistent with those of **Abdo et al. (2023)**, who discovered that participants' entrepreneurial levels are positively impacted by the entrepreneurship orientation program. Additionally, **Kemer et al. (2022)** revealed that nursing management personnel indicated a high level of entrepreneurship, supporting the findings of this study. Additionally, **Galvao et al. (2016)** reported that the participants exhibited a sufficient degree of entrepreneurial inclination.

The results of this study were consistent with those of **Ali, et al. (2020)**, who found that the majority of participants had moderate levels of entrepreneurial intention six months after the program began, while the majority had high levels of intention during the post-program phase.

The current study's findings were in line with those of **Zaki et al. (2023)**, who discovered that nearly half of head nurses and more than half of them had a moderate impression of entrepreneurial orientation and green intellectual capital, respectively. Furthermore, **Abd-Elrhaman et al. (2022)** found that a majority of the head nurses in their study exhibited a high degree of entrepreneurial orientation.

Additionally, **Haniff et al., (2016)**, who stated in their study that a sizable portion of the study sample exhibited entrepreneurial behavior, and this result concurred.

The current study supported the findings of **Ahmed et al. (2022)**, which demonstrated that over fifty chief nurses had a positive opinion of entrepreneurial leadership. Additionally, **Jakobsen et al. (2021)** found that the majority of nursing staff members might be classified as entrepreneurs, as the field of nursing equips nurses with the necessary content and contextual expertise to launch successful business ventures. Conversely, **Bakr et al. (2022)** observed in their study that over two thirds of first line managers showed low levels of entrepreneurial orientation, which contradicted this conclusion.

Along with the results of this study, the immediate post-program and follow-up phases showed an improvement in the mean score of nursing managers' overall levels of entrepreneurial orientation compared to the pre-program phase. Additionally, the total entrepreneurial orientation scores of nursing managers in relation to creativity showed a highly statistically significant improvement during the immediate post-program implementation phase. These scores decreased during the program's follow-up phase, but they were still higher than pre-program. This result was agreement with **Ali, et al., (2020)**, who reported in their study that there was a highly statistically significant difference between total score of nursing managers' entrepreneurial orientation levels throughout program phases and participants' showed significance from the pretest to the post and the follow up. In a similar vein, **Wardan et al. (2020)** discovered a statistically significant difference between post program and follow up, indicating the efficacy of the orientation program. They also demonstrated that the entrepreneurial orientation of first line managers was most strongly correlated with autonomy at the highest mean score and aggressive competitiveness at the lowest mean score. The average degree of autonomy and low level of competitive aggression were associated with the high scores of nurses.

According to a study conducted by **Baker et al. in (2022)**, nearly three-quarters of first-line managers concur that they should aggressively integrate innovations and improvements into their work. These findings also aligned with a study by **Berisha et al. (2020)**, which emphasized that an organization's internal support for innovation is an important organizational component that provides crucial context for creative decision-making.

Conversely, **Wardan et al., (2020)** found that most nurses haven't worked on innovation. Also, this result disagreed with **Wang & Yang, (2019)** who found

that innovative administrative behaviours at the middle level, finally with **Ibrahim, (2022)** who reported that the majority of staff nurses thought their head nurses lacked creativity in their profession.

The results of the current study showed that, with regard to organizational ingenuity total levels as reported by nursing managers throughout the program phase, there was a highly significant improvement in these levels as reported by the nursing managers under study after intervention for both post and follow-up phases after three months of program. Additionally, during the pre-program implementation phase, a small percentage of nursing managers indicated a high degree of organizational ingenuity. While most nursing managers at the early post-program period reported a high level of organizational ingenuity. Additionally, at the follow-up phases, somewhat fewer than three quarters of them rated a high level of organizational ingenuity.

From the researchers' point of view this may be due ambidextrous leadership enable nursing manager to handle complicated and in conflict parts simultaneously, like exploration and exploitation, effectiveness and efficiency, and novel innovation alignment, and adaptation. Furthermore, it could offer nursing managers supplementary methods and strategies for overseeing innovation streams and decision-making procedures and helps strengthen firms' innovation strategies. In addition to this may be due to the awareness of nursing managers about the importance of refining and discovering creative ideas and developing the productive environment. In addition to organizational ambidexterity is the cognitive requirement of the stage requirements current strategic opportunities that can be explored or exploited to move the organization to a better reality enables it to maximize its impact in its market environment.

This result was acceptance with **Jamal, (2022)**, who revealed in their study that majority of nursing managers had high level of organizational ingenuity perception. Also, **Mahmoud et al., (2022)**, who showed in their study that nearly half of studied sample had a moderate degree of perception toward organizational agility and organizational ingenuity. Similarly **Hameed, et al., (2022)**, who reported that the participant reported that a good presence of organizational ingenuity in the authority. Also, the result of the present study was agreed with **Hwang et al., (2023)** who concluded that the participant had high perception of organizational ingenuity activity.

In the same regard, a study implemented by **Abduljaber et al., (2022)**, who revealed that the majority of the study group had considerable role ambiguity. Additionally, this outcome was consistent with that of **Zaki, et al. (2023)**, who discovered in

their research that over two-thirds of head nurses had a favorable opinion of organizational innovation. In this regard **Salih, et al., (2024)**, who reported that the mean for ambidexterity organizational overall and standard deviations reach to results finally the results of the mean for exploration and exploitation and standard deviations reach to, results.

Regarding this, **Khoshnaw & Walee, (2023)** demonstrated that the study sample members' assessments regarding the contribution of organizational ingenuity to achieving strategic innovation received a high score. The study's findings also demonstrated that the aspects of organizational ingenuity-exploring opportunities, maximizing resource utilization, and organizational structure flexibility-collectively have a statistically significant impact on After examining possibilities, the study demonstrated true strategic ingenuity. The most important and closely connected aspects of true strategic innovation come after resource optimization and the organizational structure's flexibility.

The results of this study showed that, at the pre-program, immediate post-program, and follow-up program implementation phases, there was a highly statistically significant positive correlation between nursing managers' total knowledge and practice regarding ambidextrous leadership, entrepreneurial orientation, and organizational ingenuity. This indicates that as nursing managers gained more experience and understanding of ambidextrous leadership, their degree of entrepreneurial orientation also improved, and as a result, their organizational ingenuity improved.

From the researchers' point of view this finding can be due to good leadership practices will result in favorable consequences. Additionally, this might be the result of how ambidextrous leadership's opening and shutting behaviours interact to create change energy within the medical staff and foster an entrepreneurial mindset, which will improve opportunity exploration and opportunities. Nursing managers are being exploited.

The result of the present study was agreed with **Turnalar-Çetinkaya, (2023)**, who found in their study that the positive relationship between entrepreneurial orientation and ambidextrous leadership, which is positively associated with organization progress. In this regard **Shahraki, (2023)**, who reported that that reciprocity affects the mission of the healthcare organization, which has a good impact on ambidextrous leadership. Through investigation, this reciprocity fosters innovation by influencing organizational culture and opening leader behaviours, concluding that innovation is enhanced when exploration and exploitation are combined.

The result of the present study was in agreement with **Luu (2017a)** as they found that a positive relationship of ambidextrous leadership with entrepreneurial orientation. Similar to the previous study, **Luu (2017b)** discovered a positive correlation between entrepreneurial orientation and ambidextrous leadership, which in turn was favorably correlated with market responsiveness.

The result of the present study was supported by **Bakr, (2022) & Abd-Elrhaman., et al., (2022)**, who found that there was a highly statistically significant positive correlation between head nurses' perception of entrepreneurial orientation and organizational ingenuity. On the other hand the result of the present study was in contrast with **Al-Rawadiah, (2022)**, who found that although autonomy is a crucial component of an entrepreneurial mindset, it is unrelated to creativity, taking risks, or being proactive.

Conclusion

In the light of the current study findings, it was concluded that there were high statistical significant improvement in the nursing managers' level of ambidextrous leadership knowledge and practices after intervention both immediately post and follow up program. Furthermore, in relation to level of nursing managers' entrepreneurial orientation and organizational ingenuity there were highly statistical significant improvement and difference between mean scores assigned by nursing managers throughout the three phases of the program; pre, immediate post and follow-up program. Moreover there was a highly statistically significant positive correlation among nursing managers' total knowledge, and practice regarding ambidextrous leadership and entrepreneurial orientation and organizational ingenuity at pre- program, immediate post and follow up program phases.

Recommendations

Based on the findings of the present study, the following recommendations are proposed;

- Hospital administrators should foster a culture of ambidexterity by incorporating a periodic ambidexterity training for nursing managers at all levels .
- Hospital administrators should specify and implement a clear policy and regulation fostering ambidexterity behaviours in the healthcare settings.
- Hospital administrators should proactively support and encourage the creativity and innovative behaviours of nursing managers.
- Maintaining and raising the level of achieving organizational ambidexterity for nursing managers by providing material and moral incentives that achieves proficiency.

- Supporting the nursing managers' autonomy, job flexibility, and security by providing organizational culture contributes to the explosion of energies and the creation of ideas.
- Developing multidisciplinary training programs related to organizational ingenuity as a tool to increase awareness among healthcare professionals.
- Nursing managers should practice more independent and share the large scope of organizational vision to create an integrated, cooperative workplace environment to support organizational ingenuity
- Investigations into the long-term effects of these workshops and their impact on other outcomes are needed.
- Further studies to assess factors and challenges affecting ambidextrous leadership and entrepreneurial orientation and organizational ingenuity in practices.

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