Agile Leadership Training Program for Head Nurses and its Effect on Their Innovative Behavior

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Abstract:

Background: Organizations require agile leaders to put agility`s ideas and practices, health leaders especially need to be agile. The head nurses` daily lives are filled with creativity and innovation. The current study aimed to evaluate agile leadership training program for head nurses and its effect on their innovative behavior at Benha University Hospitals. **Design:** A quasi experimental design was used. **Setting:** This study was conducted in (31 units) at Benha University Hospitals, which were composed of bed capacity (880). **Subjects:** A convenient sample (n =45) of all the available head nurses who were having at least one year of experience at the time of study. **Tools:** Were used four of data collection tools three of them namely; agile leadership knowledge, attitude, and skills questionnaires and innovative behavior scale. **Results:** Majority of head nurses had satisfactory knowledge level and a positive attitude during post and follow up program phases. Three quadrants of head nurses had high level of skills during immediately post and follow up program phases. Meanwhile, more than half of head nurses had high level of innovative behavior at post and follow up program phases. **Conclusion:** There was highly statistically significant weak positive correlation between attitude of head nurse and their assistant regarding agile leadership and their Innovative behavior. **Recommendations:** Give enough time and space to bring out their innovation and implement it. Participate in daily meetings and decision making.

Key words: Agile leadership attitude, agile leadership skills, Innovative behavior.

Introduction:

Creating a culture of agility and innovation requires leaders to go beyond their comfortable zones and get curious about others, respectively **Koning (2019).** Agility is the key to innovation and rapid adaptability. It acts as a catalyst in innovation processes. By using agile methods in innovation management, changes can be anticipated at a very early stage and successful products can be brought to market faster and with high quality **(Goel and Ohlson, 2022).**

Agile leadership is a style of management that changes to accommodate employee empowerment initiatives and strengthens an organization's capacity to survive in unpredictably changing work environments. Organizations nowadays must implement quicker agile processes to meet the difficulties provided by the global economy and the quickly rising customer demands **(Akkaya et al., 2022).**

Agile leaders act as change agents whose leadership styles include: promoting collaboration, developing highly effective agile teams, self-organization, delivering value, driving consistent results, and effectively adjusting to changing circumstances. Agile leaders are able to adjust to a constantly shifting and unpredictable

environment. When people make it their goal to continuously learn and adopt a growth mindset, they are constantly seeking for ways to enhance their leadership abilities, their products, and their services **(Ozbayrac, 2022)**.

Innovation Behavior is essential for head nurses in today's dynamic health care system. Innovation is new or better ways of doing valued things **(Nouri and Mousavi, 2020)**.

Employee innovation behavior is characterized by creation of new products, the creation of new markets, or the improvement of work practices within an organization and the use of an entrepreneurial organizational strategy to explain employee behavior **(Smith et al., 2022)**.

Dimensions of Innovative Behavior four dimensions of innovative work behavior labeled as; idea exploration, idea generation, idea championing, and idea implementation.
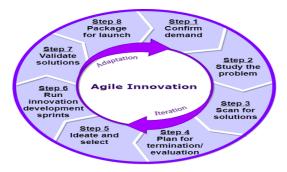
Agile innovation

Figure (A): Processes for agile innovation **Source: Holden, R., and Boustani, M. (2021):** Agile Innovation to transform healthcare: Innovating in complex adaptive systems is an everyday process, not a light bulb event January 2021BMJ Innovations 7(2)

Agile innovation teams almost always result in higher team productivity and morale, faster time to market, better quality, and lower risk than traditional approaches can achieve.

That's agile in practice: big ambitions and step-by-step progress. It shows the way to proceed even when, as is so often the case, the future is murky **(Rigby et al., 2020).**

Significance of the Study

Being present creates greater awareness in addressing the right challenges facing teams. Listen deeply and ask powerful questions to gain insights and make the right decisions to help organization/hospital move forward through every problem. Agile leadership is involved in balancing different ways of leading and managing to create an environment where agile teams get used to of collaborating, learning from each other, getting quick feedback from users, and being focused on productivity and continuous learning **(Ahuja, and Shubhangini, 2018).**

Aim of the study

This study aimed to evaluate agile leadership training program for head nurses and its effect on their innovative behavior at Benha University Hospital**.**

Research hypothesis

There will be an improvement of head nurses' knowledge, attitude and skills regarding agile leadership after implementing the program and it will have a positive effect on their innovative behavior.

Subjects and Methods

Research Design:

A quasi-experimental design was utilized to conduct this study.

Setting:

This study was conducted in (31units) at Benha University Hospitals, which were consisted of (880) bed capacity.

Subjects:

The subjects consisted of (45) a purpose convenient sample, who were (31) head nurses and their assistant (14) working in the above mentioned study setting.

Tools of data collection:

The data of the study was collected by using the following four tools;

Tool (I): Agile Leadership Knowledge Questionnaire:

It was developed by the researcher based on the review of related literature (**Borycki et al., 2014; Trapani, 2018).** It included two parts:

Part (1): It aims to assess personal data about the study subjects such as (age, marital status, gender, years of experience).

Part (2): It consisted of (47) questions divided into (21) Multiple Choice Questions, (10) Matching questions, (15) True or False and (1) question Arranging.

Scoring system:

The questions were scored as "1" for correct answer, and "zero" for incorrect answer and the total score was (30).Total knowledge score was calculated satisfactory more than 60 % of total knowledge score, while un-satisfactory less than 60 % of total knowledge scores (**Rigby, Elk, and Berez, 2020).**

Tool (II): Agile Leadership Attitude questionnaire:

It was developed by the researcher based on review of related literature as (**Hyward, 2018; Koning, 2019)**, It consisted of 24 questions divided into 3 dimensions as following: culture of focus (7 items), culture of commitment (7 items), and respect for people (10 items).

Scoring system:

Subjects' responses were scored on a three point Likert Scale ranged from (2) Always, (1) Sometimes, (0) Never. These scores were converted into a percent score. Total attitude score were calculated positive attitude 60 % of total attitude score, while negative attitude less than 60% of total attitude scores (**Grady and Malloch, 2017).**

Tool (III): Agile Leadership Skills Questionnaire:

It was developed by the researcher based on review of related literature as (**Maximini, 2018; James et al., 2019**). It was included 43 items are grouped under four main categories (cognitive skills, interpersonal skills, work skills and strategic skills) and related subcategories.

Scoring system:

Subjects' responses were scored on a three point Likert Scale ranged from (2) often, (1) sometimes and (0) rarely. For each item, the scores were summed-up and giving a mean score for the item. These scores were converted into a percent score. The level of agile leadership skills were considered high level more than 60% of total scores, while low level less than 60% of total scores (**Aqilat, 2019).**

Tool IV: Innovative Behavior Scale:

This scale developed by (**Wang et al., 2019**). It included 26 items are grouped under seven dimensions: idea generation (3items), idea search (3 items), idea communication (4 items), implementation starting activities (6 items), involving others (3 items), overcoming obstacles (4 items), and innovation out puts (3 items).

Scoring system:

For answers in each question, scores were allocated as follows: (5) always, (4) occasional, (3) uncertain, (2) rarely, (1) never. These scores were converted into a percent

score. The level of innovative behavior were considered high level more than 75% of total scores, while moderate level from 60%-75% of total scores, and low level less than 60% of total scores (**Lukes and Stephen, 2017**).

Validity

These tools and program were tested for validity through five experts from Nursing Administration departments at varies Faculties of Nursing. (1) Professor from Tanta University, (2) professors from Menoufya University, (1) Assistant professor from Benha University, and (1) professor from Ain shams University.

Reliability: Reliability of questionnaires sheets was tested for the internal consistency using Cronbach alpha coefficient.

Pilot study

It was tested on 10% of sample "5" head nurses which representing approximately of the main study subjects.

Field work

The field for this study includes four phases; assessment, planning, implementation and evaluation phase. It took seven months started at the beginning of November 2021, and was completed by the end of May 2022.

The study was

Assessment phase

The data was collected to assess head nurses' knowledge, attitude and skills regarding agile leadership and to assess head nurses innovative work behavior before implementation of the training program through using of the different tools of data collection.

Planning   phase

The training program was developed based on determined needs and relevant review of literature. Different instructional strategies, methods of teaching, media and methods of evaluation were selected to suit the learner's needs and achieve the objectives and contents of the program. The teaching sessions were achieved by using available resources, relevant contents and instructional strategies for each session. Different methods of teaching were used such as lecture, group discussion, brain storming and hand out prepared by the researcher.

Implementation phase:

The training program was consisted of 14 hours distributed as theoretical session 10 hours and practical session 4 hours. The program took about 7 sessions; the duration of each session was 2 hours depending on workload and including periods of discussion according to their achievement, progress and feedback. Feedback was given in the beginning of each session about the previous one and at the ending of each session about the current session.

Evaluation and follow up Phase

During this phase the impact of the training program was evaluated. Follow up after three months of program implementation, all the study tools were applied to the study subjects to test the follow up gain in their knowledge, attitude and skills regarding agile leadership and change in level of head nurses` innovative behavior.

Ethical considerations:

Approval of the faculty ethics committee for scientific research was done. At the interview with head nurses to collect data, they were informed about the purpose and benefits of the study and their participation

was voluntary, and they have the right to refuse to participate in the study without giving any reason.

Statistical analysis:

(SPSS version 25.0) statistical software package were used. Cronbach alpha coefficient was calculated to assess the reliability of the developed tool through its internal consistency. Chi- square (χ^2). Test of significance; paired (t) test, F test on ANOVA, Pearson correlation coefficients were used.

Results

Table (1) shows that, majority of head nurses (73.4%) were female, more than half of them (55%) had master degree in nursing, less than half of them (47.8%) were married and more than one third (35.5%) were aged between 25-29years with mean and SD (25.45± 9.93).

Figure (1) displays, more than one third (34.2%) of the head nurses had satisfactory knowledge of the agile leadership at the pre-program phase. This increased to (70.8%) at the post-program phase and (81%) at follow up study phases respectively.

Figure (2) shows that (75%) of head nurses had negative attitude behaved agile leadership through pre- program phase. Meanwhile, (69%) of them had positive attitude behaved agile leadership through post-program phase. In additionally, (80%) of them had positive attitude behaved agile leadership through follow up phase.

Table (2) Illustrates that (75%) of them had negative attitude behaved agile leadership through pre-program phase. Meanwhile, (69%) of them had positive attitude behaved agile leadership through post-program phase. In additionally, (80%) of them had positive attitude behaved agile leadership through follow up phase. It shows no statistically

significant differences among them throughout program phases.

Figure (3) displays, more than half (51%) of the head nurses had high level of skills of the agile leadership at the pre-program phase. This increased to (72.2%) at the post-program phase and (77%) at follow up.

Table (3) shows statistically significant differences among head nurses throughout program phases. Meanwhile, the scores of skills of agile leadership skills levels demonstrate improvement in in the post-program phase as compared to the pre-program phase.

Figure (4) shows that (62%) of head nurses had high level of innovative behavior in follow up phase as compared with (25%) of them in pre phase. While, (18%) of them had low level of innovative behavior in follow up phase as compared with (36%) of them in pre phase.

Table (4) shows improvement of all items of innovative behavior among head nurses throughout program phases. The post-phase and follow phase demonstrated statistically significant improvement in head nurses' behavior regarding idea communication, overcoming obstacles and total innovative behavior among head nurses with medians ranging from 2.00 to 3.00.

Table (5) shows that there was highly statistically significant weak positive correlation between attitude of head nurse and their assistant regarding agile leadership and their Innovative behavior (r=0.184). While, there was no statistically significant correlation between their knowledge and skills scores and Innovative behavior scores.

Agile Leadership Training Program for Head Nurses and its Effect on Their Innovative Behavior

Table (1): Frequency distribution of head nurses regarding their demographic characteristics (n=45)

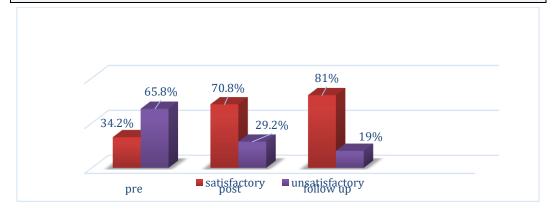| Demographic characteristics	Frequency	Percent
Age:		
25<29	16	35.5
30<39	14	31
+40	12	26.5
Mean ± SD 25.45± 9.93		
Gender:		
Male	12	26.6
Female	33	73.4
Work setting:		
Closed units	19	42.2
Open units	26	57.8
Marital status:		
Single	15	32.6
Married	22	47.8
Other	8	13
Qualification in nursing		
Bachelor of nursing	19	43
Master degree	25	55
Doctorate degree	1	2
Years of nursing experience		
1<5	12	26.6
6< 10 years	18	40
11< 20 years	8	17.7
+ 20 years	7	15.7
Mean ±SD 6.38±5.61		

Figure (1): Percentage distribution of Total head nurses` knowledge regarding agile leadership throughout program phases (n=45)
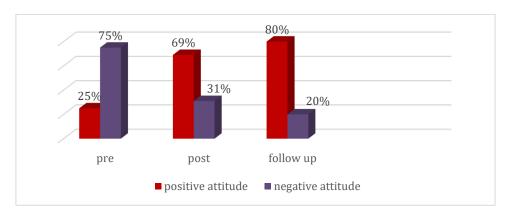

Figure (2): Percentage distribution of total head nurses' attitude regarding agile leadership throughout program Phases sample (n=45)

Table (2): Frequency distribution of head nurses' attitude regarding agile leadership throughout program Phases sample (n=45)

Attitude items	Phases						x^2 (p-value) Pre-post	x^2 (p-value) Pre-follow-up
	Pre		Post		Follow Up			
	No	%	No	%	No	%		
Culture of focus	11	24.4	14	30.5	77	51	21.60 (<0.44)	20.99 (<0.54)
Culture of commitment	15	31	13	29	78	28	23.03 (<0.63)	15.74 (<0.43)
Respect for people	9	20	8	17	78	32	29.32 (<0.54)	26.28 (<0.22)

(*) statistically significant p<0.05

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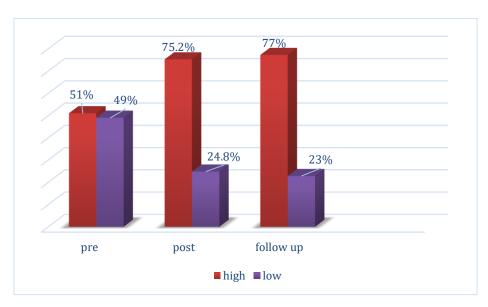

Figure (3): Percentage distribution of total head nurses skills regarding agile leadership throughout program phases (n=45).

Table (3): Frequency distribution of Head nurses' skills regarding agile leadership throughout program Phases sample (n=45)

Skills	Phases						x^2 (p-value) Pre-post	x^2 (p-value) Pre-follow-up
	Pre		Post		Follow Up			
	No	%	No	%	No	%		
Cognitive skills	23	52.2	40	88.9	40	88.9	21.60	14.83
	22	47.8	5	11.1	5	11.1	($<0.001**$)	($<0.001**$)
Interpersonal skills	26	57.8	41	91.1	38	85.0	23.03	14.13
	19	42.2	4	8.9	7	15.0	($<0.001**$)	($<0.001**$)
Work skills	22	49.00	27	60.0	29	65.0	23.03	14.13
	23	51.00	18	40.0	16	35.0	($<0.001**$)	($<0.001**$)
Strategic skills	22	49.00	28	61.1	32	70.0	23.03	14.13
	23	51.00	17	38.9	13	30.0	($<0.001**$)	($<0.001**$)

(**) Highly statistically significant $p<0.01$

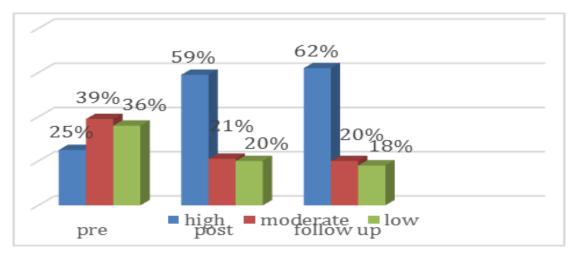**Asmaa Marouf Abdelhamid, Mona Mostafa, Heba Ali Hasan and Salwa Ibrahim**

Figure (4): Percentage distribution of total head nurses` Innovative behavior throughout program phases (n=45)

Table (4): Mean and stander deviation of head nurses regarding innovative behavior throughout program phases (n=45)

Innovative behavior items	Phases (scores: max=4)						Kruskal Wallis test	p-value
	Pre (n=45)		Post (n=45)		Follow up			
	Mean ±SD	Median	Mean ±SD	Median	Mean ±SD	Median		
Idea generation	1.80±0.42	2.00	1.90±0.48	2.00	2.81±0.48	2.00	22.55	0.44
Idea search	2.20±0.47	1.50	3.00±0.00	3.00	2.00±0.00	3.00	25.87	0.74
Idea communication	2. 00±0.77	2.00	3.00±0.67	3.00	3.00±0.67	3.00	20.12	<0.001*
Implementation starting activities	2.80±0.52	2.00	2.00±0.48	2.00	2.00±0.61	2.00	22.55	0.34
Involving others	1.00±0.36	1.50	3.00±0.23	3.00	3.00±0.51	3.00	25.87	0.77
Overcoming obstacles	2. 00±0.41	2.00	3.00±0.61	3.00	3.00±0.67	3.00	20.12	<0.001*
Innovation out puts	1.85±0.15	2.00	1.90±0.13	2.00	1.96±0.18	2.00	22.55	0.41
Total	1.82±0.38	1.82	2.84±0.27	2.88	2.74±0.32	2.88	24.67	<0.001*

(*) statistically significant p<0.01

Table (5): Correlation matrix of knowledge, skills, attitude scores and innovative behavior score

Scores	Spearman's rank correlation coefficient		
	Knowledge	skills	attitude
Innovative behavior	.007	-.173	.184**

(**) highly statistically significant at p <0.01

Agile Leadership Training Program for Head Nurses and its Effect on Their Innovative Behavior

Discussion

Regarding head Nurses' knowledge about agile leadership throughout intervention phase sample, this study revealed that more than one third of the head nurses had satisfactory knowledge of the agile leadership at the pre-program phase. This increased to (70.8%) at the post-program phase and (81%) at follow up study phases respectively. From researchers' points of view this might be due to head nurses are skilled at listening attentively, have developed debate and dialogue skills, have quick thinking abilities, enjoy learning new things, and have advanced training in agile leadership. A successful leader must also possess agile leadership skills in order to motivate their team to show up to work in top condition.

The results of the current study concur with those of **Bogosian, (2018),** who concluded the study about "Creating and Sustaining an Agile Organization: The impact of Digital Economy" reported that the agile managers must be equipped with the behavioral competencies, knowledge and skill level and managerial support to make appropriate decisions autonomously. In the other hand, **Abou (2017)** who did a study at Alexandria University on the "relationship between leadership self-efficacy and leadership effectiveness of first line nurse managers," disagreed with these findings, stating that unbiased leadership had the highest level of success.

Regarding total head Nurses' attitude related to agile leadership throughout intervention times sample this study illustrated that 75% of them had negative attitude behaved agile leadership through pre-intervention phase. Meanwhile, 69% of them had positive attitude behaved agile leadership through post-intervention

phase. In addition, 80% of them had positive attitude behaved agile leadership through follow up phase. From researchers' points of view this might be due to a daily communication, teamwork, problem-solving, technical development skills, commitment to a culture of learning and trust, flawless change management, flexibility, more creativity, and openness to using new technologies are all essential components of an Agile team.

This result is congruent with the study done by **Hariyati and Ungsianik (2018)** titled in "Improving the Interpersonal Competences of Head Nurses through Peplau's Theoretical Active Learning Approach" Who stated that more than two-thirds of head nurses reported high leadership level through follow up phase after applying active learning approaches.

The findings of this study differ from those of **Abdulla and Askari's (2021)** study "Agile Leadership Behaviors and their Role in Promoting Workplace Spirituality," which found that two thirds of head nurses exhibited positive agile leadership behaviors during the post-intervention phase because they were aware of the value of agile leadership, how it affects the level of clearance of their leader, and how it is crucial to create harmony.

Regarding total skills of agile leadership among head nurses throughout intervention phases this study revealed that more than half of the head nurses had high level of skills of the agile leadership at the pre-intervention phase. This increased to less than three quadrants at the post-program phase and more than three quadrants at follow up. From the researcher opinion, this might be due to the educational program was successful in enhancing head nurses' leadership competencies regarding agile leadership practice to adapt and respond to rapid change.

Additionally, the researcher believes that the nature of agile leadership practice improves job performance, patient satisfaction, active communication, interpersonal relationships, and interactions, supports effective teamwork, and staff commitment to the organization.

This result was consistent with a study by **Bushuyeva et al. (2019)** titled "Agile Leadership of Managing Innovation Projects, Innovative Technologies, and Scientific Solutions for Industries," which found that leaders develop agile leadership abilities and behavior patterns over time, which enhances job performance. According to **Abdulhalim (2020)** who discussed his study on "The degree of practice university leaderships to the dimensions of agile Management and its relationship to Effectiveness of the job performance from the viewpoint of faculty Staffs at New Valley University," applying agile leadership skills to a moderate extent increased understanding, collaborating, learning, and remaining flexible to achieve high-performing results.

Regarding total innovative behavior among head nurses throughout intervention phases this study revealed that compared the total innovative behavior among head nurses throughout intervention phases. It shows improvement of total innovative behavior in post and follow up phases as compared with pre phase. It shows that two third of them had high level of innovative behavior in follow up phase as compared with quadrant of them in pre phase. While, less than one fifth of them had low level of innovative behavior in follow up phase as compared with 36% of them in pre phase. From researchers' points of view this finding could be due to the success of nurse leaders in the hospital to be innovative and provide manage the operations successfully. Where, the health organization is building a clear, visible and promoted future line for all

members, which gave staff a future vision to put their job in innovative and increase creative level. In addition of changing competition conditions and rapidly differentiating patients` demands reveal the necessity of agile leaders in health organization, because agile leaders work hard to gain and build a strong bond with staff and patient beyond staff and patient satisfaction that reach to highly innovative.

This study's findings are consistent with those of **Kamel and Aref's (2017)** research on staff nurses' perceptions of organizational culture and how they relate to innovative work practices at critical care units, which found that around half of staff nurses exhibit highly innovative work practices. On the other hand, **Abd ElFattah (2017)** found that more than half of participants scored in the middle of the range for perceived innovation behavior in a study he conducted in Egypt about "Innovation behavior levels and its relation with TIGER-based nursing informatics competencies among critical care nurses".

Regarding Correlation matrix of knowledge, skills, attitude scores and Innovative behavior score this study revealed that there was highly statistically significant weak positive correlation between attitude of head nurse regarding agile leadership and Innovative behavior of staff nurses (r=0.184). While, there was no statistically significant correlation between their knowledge and skills scores and Innovative behavior scores. According to studies, this could be because head nurses who understand the value of agile leadership and use it well are more willing to try new things, which will help staff nurses improve and perform at their very best when they report to work. Empowering employees to take care of their own needs, handle their own problems, and ease stress brought on by work overload. Staff nurses can have a significant

role in encouraging innovative behavior because they reinforce and soothe feelings of disassociation drive, mistrust, and a high intention to burn out.

By **Muzafary et al., (2019)** who investigated "The influence of transformational leadership on the employees innovative work behavior" and came to the conclusion that transformational leadership has a profound impact on innovative work behavior. Likewise, **Jaiswal and Dhar (2015**) in their study conducted, in India, about "Transformational leadership, innovation climate, creative self-efficacy and employee creativity: A multilevel study" and revealed that transformational leaders can foster a climate for innovation that promotes creativity.

Conclusion

There was highly statistically significant weak positive correlation between attitude of head nurse and their assistant regarding agile leadership and their Innovative behavior (r=0.184). While, there was no statistically significant correlation between their knowledge and skills scores and Innovative behavior scores. This finding confirmed the research hypothesis which were "There will be an improvement of head nurses' knowledge, attitude and skills regarding agile leadership after implementing the program and it will have a positive effect on their innovative behavior.

Recommendations

1. Give enough time and space to bring out their innovation and implement it.

2. Participate in daily meetings and decision making.

3. Attend of training in agile leadership principles should be set as prerequisites for promotion to the position of a nurse manager or leader.

4. In the future, it is recommended to conduct a study about strategies for improving head nurses` innovative behavior through agile leadership.

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برنامج تدريبى عن القيادة الرشيقة على رئيسات التمريض و تأثيره على سلوكهم الإبداعى

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تعتبر فرق القيادة الرشيقة مجموعات صغيرة ذاتية الحكم , متعددة الوظائف ومتخصصة لحل المشاكل المعقدة بطريقة سريعة. يعمل الفريق الرشيق بشكل وثيق مع المرضى, يطور سلسلة النماذج الأولية لإسراع الإبتكارفى الخدمات والعمليات. كما أن للقادة الرشيقين عقلية شاملة وتعاونية. فهم يعترفون بفردية الأفراد , يتفهمون احتياجات موظفيهم وزملائهم لأداء مسئولياتهم بفاعلية.كذلك يقدر القادة الرشيقون التغيير المستمر ويستخدمونه كفرصة لتعلم و تحسين سلوك الإبتكار. هدفت هذه الدراسة إلى تقييم تأثيربرنامج عن القيادة الرشيقة على السلوك الإبداعى لرئيسات أقسام التمريض. تم استخدام تصميم شبه تجريبي. أجريت هذه الدراسة بمستشفى بنها الجامعى. العدد الإجمالى للأسرة (880 سرير). تكونت عينة البحث من جميع رئيسات أقسام التمريض المتاحين وقت الدراسة (عددهم = 45). وأظهرت نتائج الدراسة أن: أكثر من ثلثى رئيسات أقسام التمريض (69٪) لديهم اتجاه إيجابى نحو القيادة الرشيقة فى مَرحلة ما بعد انتهاء البرنامج مباشرةً معظمهم (80٪) لديهم اتجاه إيجابى نحو القيادة الرشيقة فى مرحلة المتابعة على التوالي بعد ثلاثة أشهر.أقل من ثلاثة أرباع رئيسات أقسام التمريض (72٪) لديهم مستوى عال من مهارات القيادة فى مَرحلة ما بعد انتهاء البرنامج مباشرةً و أكثر من ثلاثة أرباعهم (77٪) فى مرحلة المتابعة على التوالي بعد ثلاثة أشهر .أقل من ثلثى رئيسات أقسام التمريض (62٪) لديهم مستوى عال من السلوك الإبداعى فى مرحلة المتابعة على التوالي بعد ثلاثة أشهر. كما أسفرت الدراسة الحالية إلى وجود تحسن إحصائى كبير فى مستوى المعرفة والاتجاهات والمهارات لرئيسات أقسام التمريض حول القيادة الرشيقةً كما كان هناك تحسنا إحصائيا كبيرا فى مستوى السلوك الإبداعى لهم بعد البرنامج مباشرة وبعد ثلاثة أشهر. بالإضافة إلى ذلك كان هناك ارتباط إيجابى قوى ذو دلالة إحصائية عالية بين درجات معرفة و مهارات رئيسات أقسام التمريض للقيادة الرشيقة و مستوى السلوك الإبداعى بعد تنفيذ البرنامج مباشرة وبعد ثلاثة أشهر .