Enhancing Innovative Work Behavior in Nursing through Job Crafting Intervention

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Abstract

Background: Job crafting facilitates change and motivates the nurse to find novel means of performing tasks. Changing work methods increases involvement and decreases the level of boredom, frustration, and emotional exhaustion. Therefore, nurses feel enthusiastic and energetic, which stimulates the creation of new ideas. ***Aim:*** This study aimed to assess the effect of a job crafting intervention program on nurses' job crafting behaviours and innovative work behaviour. ***Design***: A quasi-experimental research design was utilized. ***Setting***: The study was conducted at Zagazig university hospital, Alsharqia, Egypt. ***Subject***: A sample of 310 nurses was recruited and equally assigned into two groups: study and control (155 nurses each). ***Tools*:** Four instruments were used for data collection: a job crafting knowledge questionnaire, a job crafting scale, a general skills checklist, and an innovative work behavior scale. ***Results***: Before the intervention, 57% of the studied nurses had unsatisfactory job crafting knowledge, 94.2% had poor job crafting skills, and 52.9% demonstrated low levels of innovative work behaviour. After the implementation of the program, noticeable improvements were observed; 70% of the studied nurses had satisfactory job crafting knowledge, 83.2% had good job crafting skills, and 40% demonstrated high levels of innovative work behaviour. Statistically significant differences were found between pre- and post-intervention results ($p < 0.05$). ***Conclusion***: The job crafting intervention program had a statistically significant positive effect on improving nurses' job crafting knowledge, skills, and innovative work behavior immediately after implementation and at three-month follow-up, with better outcomes in the study group compared to the control group. ***Recommendation***: Healthcare organizations should adopt job crafting educational programs as part of human resource development strategies to enhance innovation, employee engagement, and organizational effectiveness.

Keywords: *Job Crafting; Innovative Work Behavior; Intervention Program; Nurses.*

Introduction

The nursing workplace is characterized by diversity, complexity, and high workload demands, often with limited time to complete tasks. Therefore, nurses are required to perform their duties with professionalism and efficiency. To cope with these challenges, nurses engage in self-directed behaviors to reshape their work environment and assign meaning to their roles in ways that align with their preferences and capabilities. These voluntary behavioral changes are referred to as job crafting **(Jeong & Han, 2024).** Job crafting represents a creative approach that enables nurses to enhance the tools and resources available in their work. Job crafting training equips nurses with the necessary skills to actively adapt their performance to better fit their work environment, thereby improving their engagement and readiness to learn (**Ageiz & Abd El Mageed, 2023**).

Nurses, as the backbone of the healthcare system, provide approximately 80% of primary care services, often under resource constraints, which positions them to contribute innovatively to healthcare delivery. Job crafting, as a proactive behavior, involves employees modifying their job characteristics to increase job resources and reduce job demands. It includes four main strategies: increasing structural job resources (e.g., autonomy and task variety), enhancing social resources (e.g., support and feedback), seeking challenging job demands, and reducing hindering job demands (**Sukirno et al., 2024**).

Moreover, job crafting interventions involve structured guidance that encourages nurses to redesign their work in ways that align with their strengths, motivations, and organizational goals, ultimately enhancing both individual and organizational performance. These interventions have gained increasing attention in recent years, with evidence indicating their effectiveness in improving subjective well-being and job performance. Current intervention methods include job crafting training programs, experiential exercises, application of the Job Demands–Resources model, and personal development planning (**Xizhou Tian et al., 2022**).

Job crafting interventions play a crucial role in enabling nurses to better understand and modify their job demands and resources. Through participation in such interventions, nurses can develop personalized job crafting plans aimed at increasing job resources and reducing excessive demands **(Cotel et al., 2023).**

Furthermore, engaging in job crafting fosters positive emotions and enhances personal and job resources, which in turn promotes innovative work behavior. Innovative work behavior involves the generation, promotion, and implementation of new ideas aimed at improving healthcare quality. Evidence suggests that innovative practices contribute significantly to improving hospital performance, particularly when nurses actively participate in idea generation and problem-solving **(Hashemian et al., 2024)**.

Innovation in healthcare is essential for overcoming challenges, controlling costs, improving patient experiences, and enhancing population health outcomes. Within this context, nursing innovation plays a vital role in advancing healthcare systems. Nurses are expected to engage in creative work behaviors to prevent illness, identify and minimize risk factors, provide individualized care, improve professional practices, and promote healthy lifestyles. As the largest workforce in healthcare, nurses must adopt innovative approaches to meet the increasing demand for efficient, high-quality, and cost-effective healthcare services (**Alwali, 2023**).

Innovation in nursing is defined as the generation, promotion, and implementation of new ideas and methods, which is essential for addressing challenges within healthcare systems. Nurses are key contributors in this regard, as their innovative capabilities significantly influence the quality of patient care and patient satisfaction. Additionally, engaging in innovative behaviors enhances nurses' work efficiency and supports them in managing the complexities of modern healthcare environments, highlighting the importance of fostering an innovation-oriented culture within the nursing profession (**Ma & Ma, 2024**).

Finally, job crafting provides nurses with the opportunity to reshape their jobs, and this autonomy motivates them to identify better ways of performing their tasks through optimal use of available resources, thereby enhancing creativity and innovation in the workplace. Consequently, job crafting can serve as a motivational strategy that improves nurses' performance and contributes to organizational effectiveness. Healthcare managers are therefore encouraged to integrate job crafting strategies and supportive organizational policies to promote innovation, support diversity, and enhance both individual and organizational outcomes (**Baig et al., 2022**). Therefore, the present study aimed to assess the effect of a job crafting intervention program on nurses' job crafting behaviors and innovative work behavior

Research hypothesis

1. Nurses' knowledge and skills about job crafting behaviors will be improved after implementation of a training program about job crafting.
2. The innovative work behavior level of nurses will be improved after implementation of a training program

about job crafting.

1. Methods

1.1. Study Design

A quasi-experimental design (pre-posttest) was used to achieve the aim of the present study.

1.2. Study Setting

The study was conducted in eight teaching hospitals spread over two sectors of Zagazig University Hospitals (academic hospitals) in Egypt served as the study's site. The hospitals' combined bed capacity is roughly 2027 beds and 32 incubators.

1.3. Study Sample

Simple random sample (310) nurses from a total population of 4,030 nurses working in the above mentioned setting. They were divided randomly into two equal groups; study and control groups. Each group has 155 nurses.

Inclusion criteria: Nurses who were involved in direct patient care, of both genders, with a minimum of six months of professional experience, and willingness to participate in the study.

Exclusion criteria: Nurses who were currently undergoing orientation, those working in outpatient settings, and those employed exclusively in administrative roles were excluded.

1.4. Tools of data collection: Four tools were used for data collection.

Tool I: Job Crafting Knowledge Questionnaire*:* This tool was developed by the researcher based on related literature (**petrou et al., 2012**; **Bakker and Demerouti, 2014** ; and **De Gennaro, 2019)** and consisted of two parts as follows:

Part one: **personal and work characteristics**, to identify personal data of nurses' such as: (age, gender, material status, educational level, years of experience, department, hospital and attending training course about job crafting)

Part two: knowledge questionnaire sheet: To assess nurses' knowledge regarding job crafting, it consisted of 26 multiple-choice questions , covered definition of job crafting, Core characteristics, importance, models, types, and strategies needed for being job crafter.

The scoring system: The questions were scored as "one" for correct answers and "zero" for incorrect answers for each sheet. The total scores of all questions ranged from 0 to 26. The nurse's score was considered satisfactory knowledge if the score was more than 60% (20-26 points) and unsatisfactory knowledge if the score was equal to or less than 60% (less than 20).

Tool II: Job Crafting Scale (JCS): Developed by **Petrou et al. (2012)** to measure the level of nurses' job crafting behaviors. It consists of (13) items and grouped under three dimensions: seeking resources (6 items), seeking challenges (3 items), and reducing demands (4items).

Scoring system: Nurses' responses were measured on a five-point Likert scale ranging from always (5) to never (1). A nurse's score was classified as indicating a high level of job crafting behavior if it exceeded 75%, a moderate level if it was between 50% and 75%, and a low level if it was below 50%. The tool's reliability was determined by calculating its internal consistency using the Cronbach alpha coefficient, which was 0.919.

Tool II: General Job crafting skills checklist

It was developed by researcher based on the Michigan Job Crafting Exercise **(JCE; Berg et al., 2008),** which included job analysis, personal analysis, and job-personal analysis, and operationalized according to the JD-R model. It aims to train the participants in maximizing their job resources, optimizing the increased job demands, and adapting to new job challenges.

Scoring system: Nurses' general skills responses were measured on two scales: "0 = not done" and "1 = done." The total scores of all questions were 20. The total score was calculated and converted into a percent score by dividing the nurse's total score by the maximum possible score and then multiplying by 100%. A summated score of the 20 items of the overall nurses' general skills ranges from 0 to 20. If the score was less than 50% considered poor, and if the score was more than 50% considered good.

Tool IV: Innovative work behavior scale

It was developed by **De Jong and Den Hartog (2010)** to measure the innovative work behavior level of nurses as perceived by nurses. It consists of 10 items grouped under four dimensions: idea exploration (2 items), idea generation (3 items), idea championing (2 items), and idea implementation (3 items).

Scoring system: Nurses' responses were measured on a five-point Likert scale ranging from always (5) to never (1). The nurse's score was considered a high level of innovative work behavior if it was >75%, a moderate innovative work behavior level if it was ≥ 50% - <75%, and a low innovative work behavior level if it was < 50%. The tool's reliability was determined by calculating its internal consistency using the Cronbach alpha coefficient, which was 0.880.

Validity of the tools:

A panel of five nursing professionals from Zagazig University verified these instruments, which were produced by the original authors and modified by a researcher based on literature reviews. Content validity was evaluated using a two-part face and content validity sheet, in which experts rated each item as relevant or irrelevant and offered overall feedback on clarity and comprehensiveness. Adjustments were made in response to their recommendations. Face validity investigated the subjective judgment of the test's relevance, taking expert comments on the tool's structure, layout, and scoring system.

Pilot study: A pilot study was carried out on 10% of nurses (32) to test the tools feasibility, understandability and to estimate the time consumed for filling in the forms. A brief explanation of the purpose of the study was provided to every participant in the pilot study, and then they were provided with a copy of the study tools. The time consumed in answering the questions was about 20- 30 minutes for each tool. These nurses were included in the main study sample. The necessary modifications were done according to the answers and comments made by nurses.

Job crafting intervention program (Field work): Fieldwork was conducted over a period of six months, from mid-August 2023 to the end of January 2024, at Zagazig University Hospitals. The intervention program was implemented for the study group in clinical settings through 15 sessions totaling 23 hours (7 hours theoretical and 16 hours practical). As it was not feasible to train all nurses simultaneously, participants were divided into smaller groups, and the sessions were repeated until all 155 nurses completed the full program.

The program consisted of two main components. The theoretical component covered key concepts of job crafting, including its definition, distinctions from traditional job design, purposes and motivations, the importance of being a job crafter, core characteristics, and relevant models such as the Job Characteristics Model and the Job Demands–Resources Model. It also addressed different forms of job crafting (task, relational, and cognitive), job resources and demands, challenges in nursing careers, and strategies such as seeking resources, seeking challenges, reducing job demands, and developing a personal crafting plan.

The practical component included a series of structured activities and exercises designed for nurses providing direct patient care in their clinical units. Nurses in each group were instructed to read and follow activity guidelines. A group leader was randomly assigned to facilitate role distribution among group members. Participants then engaged in role-playing scenarios, rotating roles to enhance their ability to respond effectively to different work situations.

At the end of each session, the researcher evaluated participants' performance using the Michigan Job Crafting Exercise through an observational checklist. Participants were guided to identify job resources that could be enhanced, demands that could be minimized without affecting workflow, and aspects of their roles they found challenging. Group discussions were conducted to support the development of individualized "Personal Crafting Plans" and to provide constructive feedback. The program was delivered four days per week for each group over approximately 23 weeks. A variety of teaching methods were employed to enhance engagement and motivation, including lectures, group discussions, brainstorming, role-playing, and scenario-based learning. Teaching materials included PowerPoint presentations, a whiteboard, and printed program booklets covering both theoretical and practical aspects of job crafting.

Ethical Considerations:

The study was approved by the Ethics Research Committee at the Faculty of Nursing, Zagazig University. The researcher explained the nature, purpose, and benefits of the study to nurses in the study sample. Oral and written consent were taken from subjects, and they were reassured about the confidentiality and anonymity of the study. They were informed about their right to refuse or withdraw from the study at any time without giving a reason.

Statistical analysis

All data were collected, tabulated, and statistically analyzed using SPSS 24.0 for Windows (SPSS Inc., Chicago, IL, USA, 2011). Quantitative data were expressed as the mean ± SD & median (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). A paired test was used to compare between paired variables of normal distribution. Repeated measure ANOVA was used to compare multiple paired variables of normal distribution. The percent of categorical variables was compared using the chi-square test or Fisher's exact test. Pearson's correlation coefficient was calculated to assess the relationship between various study variables; (+) a sign indicates direct correlation & (-) a sign indicates inverse correlation. Also, values near 1 indicate strong correlation & values near 0 indicate weak correlation. All tests were two-sided. A p-value < 0.05 was considered statistically significant (S), and a p-value ≥ 0.05 was considered statistically insignificant (NS).

2. Results

Table 1 shows personal data of nurses, it is clear from the table that 43.6% of study group nurses were aged 30 to less than 40, while 35.5% of control group nurses were aged 20 to less than 30. The majority of nurses in both groups were females, married, worked 8 hours, and employed in Emergency Hospital, New Surgical Hospital, and Internal Medicine Hospital. Educationally, 43.9% of study group nurses had a Technical Nursing Institute qualification compared to 40.0% in the control group who held a Nursing Diploma. About 51.0% of study group nurses worked in critical care units, and 32.9% had 5 to 10 years of experience, with nearly all nurses from both groups not having undergone job crafting training.

Figure 1 illustrates that the majority of nurses demonstrated unsatisfactory level of knowledge regarding job crafting in the pretest in both the study and control groups (57% and 74%, respectively). In contrast, in the post-test approximately 70% of nurses in the study group achieved a satisfactory level of knowledge, compared to 52% in the control group. Moreover, three months later the proportion of nurses in the study group with satisfactory knowledge increased to 76%, indicating a sustained improvement. These findings suggest that the program was effective in enhancing nurses' knowledge of job crafting behaviors. Consequently, Hypothesis One was supported.

Figure 2 illustrates that the highest percentage of nurses had a low level of job crafting behaviours in both the study and control groups before the program implementation (57.4% & 42.6%, respectively). After the program implementation, 40.6% of nurses in the study group had high levels of job crafting behaviours compared to 3.9% in the control group. Additionally, three months after the program implementation, 41.3% of nurses in the study group had a high level of job crafting behaviours. This suggests that the program was effective in improving the nurses' job crafting behaviours.

Table (2) demonstrates that nurses job crafting behaviors' dimensions in the study group increased throughout the program phases, with a highly statistically significant difference in both the pre-post and pre-follow-up phases of the program at P-value= (0.000). On the other hand, there was a highly statistically significant difference between study and control groups in all job crafting behaviors after the program implementation and three months later in favor of the study group at P-value=(p=0.000).

Figure 3 shows that 94.2% of nurses in the study group had a poor level regarding general job crafting skills before program implementation compared to 83.2% of nurses who had a good level after program implementation. Hypothesis one was accepted

Figure 4 illustrates that the majority of nurses had a low level of innovative work behavior in both the study and control groups before the program implementation (52.9% & 61.3%, respectively). After the program implementation, 40.0% of nurses in the study group had high levels of innovative work behavior compared to the control group (23.2%). Additionally, three months after the program implementation, 49.7% of nurses in study group had a high level of innovative work behavior. Consequently, Hypothesis two was supported.

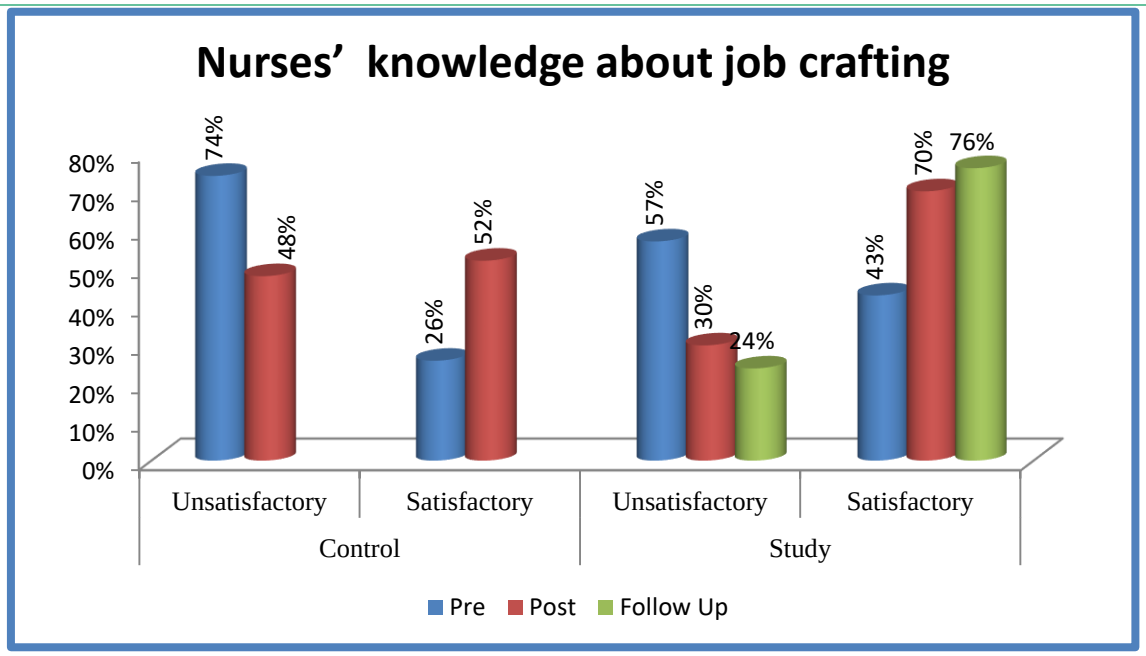
Table (3) concludes that innovative work behavior dimensions among nurses increased in the study group throughout program phases, with a highly statistically significant difference in both the pre-post and pre-follow-up phases of the program at P-value= (0.000). On the other hand, there was a highly statistically significant difference between study and control groups in all innovative work behavior dimensions immediately after the program implementation and three months later in favor of the study group, at a p-value of 0.000.

Table (4) shows that there was a statistically significant correlation between nurses' knowledge and their level of job crafting behaviors with innovative work behavior ($r = 0.184$ at P-value = 0.022 & $r = 0.161$ at P-value = 0.045, respectively), after the implementation of job crafting program.

Table (1): Frequency distribution of nurses' personal data (n=310)

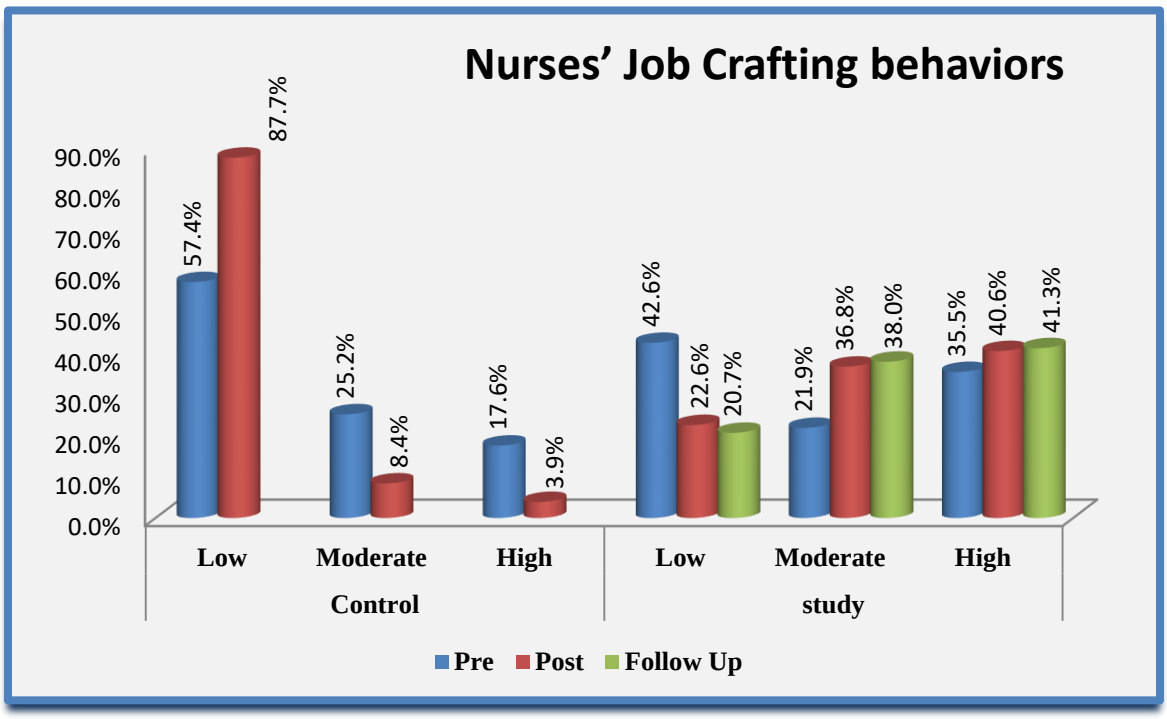
Personal data	Study group (n=155)		control group (n=155)		X^2	p-value
	No	%	No	%		
Age in years						
20 to < 30 year	51	39.4	55	35.5	27.109	**0.000***
30 to < 40 year	67	43.2	43	27.7		
40 to < 50 year	27	17.4	37	23.9		
≥ 50	0	0.0	20	12.9		
Mean±SD	**1.7806±0.7232**		**2.1419±1.0472**			
Gender						
Male	33	21.3	32	20.6	0.019	1.000
Female	122	78.7	123	79.4		
Marital Status						
Single	22	14.2	33	21.3	8.134	**0.043***
Married	128	82.6	113	72.9		
Widow	2	1.3	0	0.0		
Divorced	3	1.9	9	5.8		
Mean/SD	**1.9097±0.4749**		**1.9032±0.6623**			
Work hours/day						
8 hours	106	68.4	113	72.9	0.762	0.454
12 hours	49	31.6	42	27.1		
Mean/SD	**1.3161±0.4665**		**1.2710±0.4459**			
Working units						
Critical care unit	79	51.0	71	45.8	0.827	0.213
Un-critical unit	76	49.0	84	54.2		
Mean/SD	**1.4903±0.5015**		**1.5419±0.4999**			
Educational qualification						
Nursing Diploma	53	34.2	62	40.0	14.728	**0.002***
Technical Nursing Institute	68	43.9	42	27.1		
Bachelor of Nursing	31	20.0	51	32.9		
Master's	3	1.9	0	0.0		
Mean/SD	**1.8968±0.7827**		**1.9290±0.8536**			
Years of Experience						
6months to ≤ 5 years	29	18.7	28	18.1	4.205	0.240
5 to < 10 years	51	32.9	38	24.5		
10 to < 20 years	33	21.3	32	20.6		
≥20 years	42	27.1	57	36.8		
Mean/SD	**2.5677±1.0812**		**2.7613±1.1344**			
Attend training program about job crafting						
Yes	0	0.0	1	0.6	1.003	0.500
No	155	100.0	154	99.4		
Mean/SD	**2.000±0.0000**		**1.9935±0.0803**			
Hospital name						
Cardiac and Chest Hospital	21	13.5	21	13.5	0.000	1.000
The Pediatric Hospital	17	11.0	17	11.0		
El-Salam Hospital	10	6.5	10	6.5		
Delivery and Premature Hospital	13	8.4	13	8.4		
New-Surgical Hospital	33	21.3	33	21.3		
Internal-Medicine Hospital	31	20.0	31	20.0		
Emergency Hospital	30	19.4	30	19.4		
Mean/SD	**4.5032±2.0619**		**4.5032±2.0619**			

***P<0.05= Significant** **X^2 Chi Square Test**



Satisfactory= >60 % Unsatisfactory= ≤60%

Figure (1): Total level of knowledge about job crafting throughout the program phases among studied nurses (n=310).



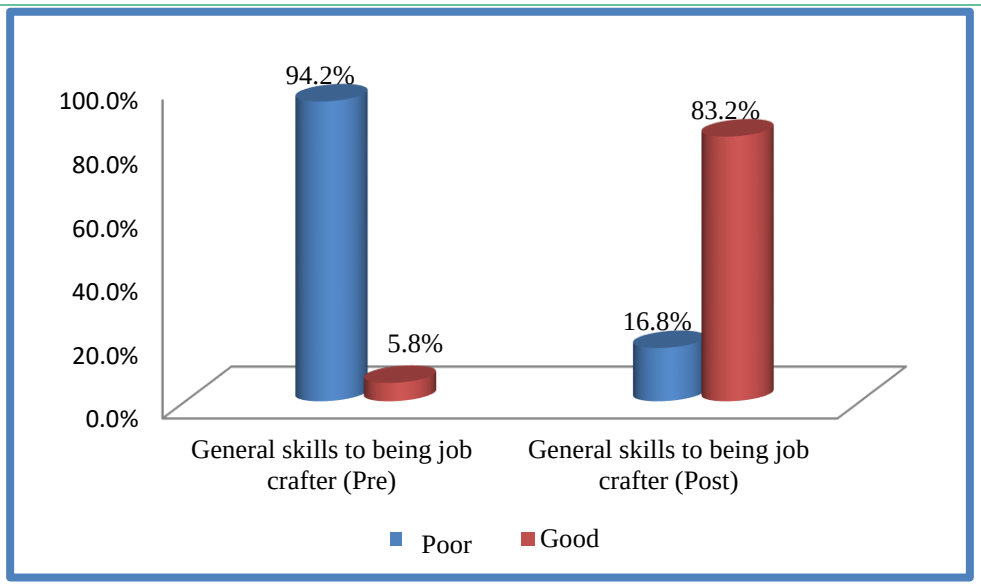
Low < 50%, Moderate 50% > to < 75%, High > 75%.

Figure (2): Total level of job crafting behaviours among nurses throughout the program phases in the study and control groups (n= 310).

Table (2): Nurses' job crafting behaviors dimensions throughout the program phases in the study and control groups (n= 310)

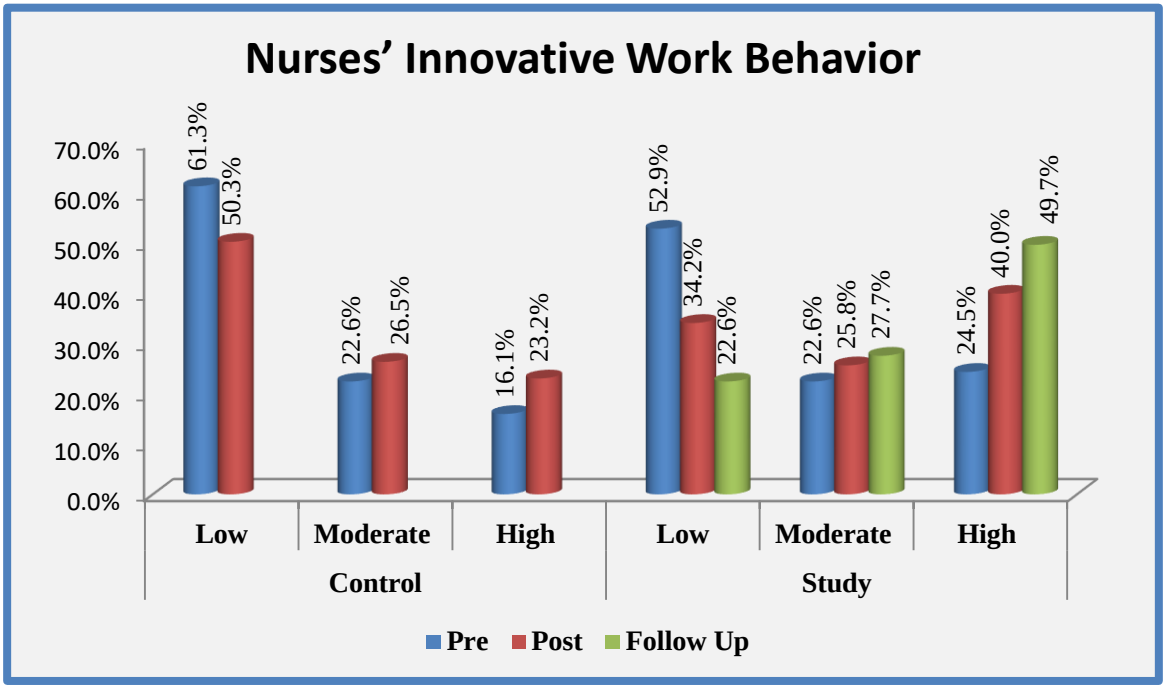
Job crafting behaviors	Time	Study group (n=155)	Control group (n=155)	P-value
		Mean ± SD	Mean ± SD	
Seeking Resources	Pre	3.8097±0.691	3.4806±0.654	**0.000**
	Post	4.3204±0.380	3.4946±0.655	**0.000**
	Follow up	4.6097±0.157		
P-value	Pre - Post	**0.000****	**0.222**	
	Pre- Follow	**0.000****		
Seeking Challenge	Pre	2.5699±1.229	2.3140±1.091	**0.053**
	Post	3.8043±0.629	2.3075±1.027	**0.000****
	Follow up	4.2108±0.476		
P-value	Pre - Post	**0.000****	**0.938**	
	Pre- Follow	**0.000****		
Reducing demands	Pre	3.1468±0.835	2.9065±0.748	**0.008**
	Post	4.1048±0.494	2.7645±0.735	**0.000****
	Follow up	4.4145±0.306±		
P-value	Pre - Post	**0.000****	**0.040**	
	Pre- Follow	**0.000****		

***p<0.05= significant.**



Good: > 50% **Poor: <50%**

Figure (3) Levels of general job crafting skills that nurses used to craft their job in the study group (n=155)



Low < 50%, Moderate 50% > to < 75%, High > 75%.

Figure (4) Total level of nurses' innovative work behavior throughout the program phases in the study and control groups (n= 310)

Table (3): Nurses' innovative work behavior dimensions throughout the program phases in the study and control groups (n= 310)

Innovative Work Behavior dimensions	Time	Study group (n=155)	Control group (n=155)	P-value
		Mean ± SD	Mean ± SD	
Idea exploration	**Pre**	3.6645±0.879	3.4419±0.845	**0.024**
	Post	4.2452±0.526	3.4419±0.862	**0.000**
	Follow up	4.4290±0.349		
P-value	**Pre - Post**	**0.000**	**1.000**	
	Pre-Follow	**0.000**		
Idea generation	**Pre**	3.9699±0.759	3.6925±0.707	**0.001**
	Post	4.4022±0.446	3.6774±0.693	**0.000**
	Follow up	4.5118±0.345		
P-value	**Pre - Post**	**0.000**	**0.786**	
	Pre-Follow	**0.000**		
Idea championing	**Pre**	3.8355±0.898	3.5548±0.876	**0.006**
	Post	4.3398±0.478	3.5742±0.860	**0.000**
	Follow up	4.4548±0.404		
P-value	**Pre - Post**	**0.001**	**0.757**	
	Pre-Follow	**0.023**		
Idea implementation	**Pre**	3.9505±0.844	3.6129±0.689	**0.000**
	Post	4.3398±0.478	3.5935±0.688	**0.000**
	Follow up	4.4366±0.328		
P-value	**Pre - Post**	**0.039**	**0.731**	
	Pre-Follow	**0.039**		

***p<0.05= significant.**

Table (4): Correlation among nurses' knowledge, General job crafting skills, Job Crafting behaviors, and Innovative work behavior after program implementation in the study group (n=155)

Variables		Total Knowledge	Total Job Crafting behaviors	Total Innovative work behavior	General job crafting skills
Total Knowledge	**r**	1.000			
	P	.			
Total Job Crafting behaviors	**r**	0.184	1.000		
	P	**0.022**	.		
Total Innovative work behavior	**r**	0.161	0.513	1.000	
	P	**0.045**	**0.000**	.	
General job crafting skills	**r**	0.020	0.132	0.006	1.000
	P	0.804	0.101	0.943	…..

(r): Correlation coefficient p>0.05: no significant, * p<0.05: significant

Discussion

Job crafting enables nurses to actively reshape their tasks, work relationships, and role perceptions, thereby increasing their sense of control and autonomy. By enhancing personal agency, job crafting can reduce feelings of helplessness and work-related strain, particularly in demanding settings such as palliative care. This increased autonomy creates favorable conditions for creative problem-solving and innovative practices in nursing care.

The findings of the present study revealed that nurses' knowledge of job crafting in the study group improved significantly throughout the program phases, with statistically significant differences observed between pre- and post-program as well as between pre- and follow-up assessments. Additionally, a statistically significant difference was found between the study and control groups in favor of the study group immediately after the program and at the three-month follow-up. These findings support the first hypothesis, which proposed that nurses' knowledge of job crafting would improve following the intervention.

These results are consistent with those of **Lashen, Abd El Megeed, & ElEwa (2023)**, who reported significant improvements in job crafting knowledge following an educational program among nurses in Egypt. Similarly, **Kassem & Ibrahim (2022**) found that nurses demonstrated enhanced knowledge levels, with sustained retention after three months. Comparable findings were reported by **Sook & JiSoo (2022)**, confirming the effectiveness of educational interventions in improving job crafting knowledge. In addition, **Ageiz & Abd El Mageed (2023)** highlighted that combining theoretical and practical training significantly enhances nurses' understanding of job crafting.

Conversely, these findings differ from those of **Teng (2019),** who reported that individuals in other sectors had pre-existing familiarity with job crafting due to prior professional training, suggesting that

nurses in the current study had limited prior exposure, which explains their lower baseline knowledge.

Regarding job crafting behaviors, the current study demonstrated substantial improvements across various intervention phases, supporting the research's objective and highlighting the lasting impact of the program on nurses' ability to actively modify their work experiences. The findings emphasize job crafting as a skill that can be developed through training, in line with earlier research suggesting that such behaviors can be fostered through targeted interventions (**van Wingerden, Bakker, & Derks, 2017; Sakuraya et al., 2016)**. Furthermore, the results are consistent with **Kassem & Ibrahim (2022)**, who reported sustained improvements in job crafting behaviors among nurses. However, they contrast with **Sakuraya et al. (2020),** who found no significant long-term effects of job crafting interventions on work engagement.

In terms of job crafting skills, the study found a significant improvement in job crafting skills among nurses after a training program, indicating the effectiveness of the intervention. This enhancement is unlikely due to chance and supports the initial hypothesis. Factors contributing to this improvement include structured training with practical methodologies and opportunities for repeated practice in essential job crafting skills, such as job analysis and personal crafting plan development.

These findings are supported by **El-Gazar et al. (2023),** who revealed that the intervention was effective in enhancing resource-seeking behaviors and reducing job demands among the intervention group compared with the control group over time, and by **Topa & Aranda-Carmena (2022)** who found increased engagement in job crafting activities following structured training. Additionally, **Demerouti et al. (2021)** emphasized that job crafting interventions enhance adaptation, reduce work stress, and improve resource utilization. However, some studies reported inconsistent findings. For example, **Van den Heuvel, Demerouti, & Peeters (2015),** and **Gordon et al. (2018)** found limited or non-significant improvements in certain dimensions of job crafting, highlighting variability in intervention outcomes.

The second hypothesis that job crafting improves professional outcomes is supported by the study's findings, which show a significant increase in nurses' innovative work behavior (IWB) throughout the program, especially in the pre-post and pre-follow-up phases, when compared to a control group. Job crafting fosters innovation by enabling nurses to generate and implement new ideas in their practice. It empowers them to address workplace challenges effectively, which aligns with social exchange theory: as nurses gain new resources through training, they are motivated to modify tasks and enhance job resources, leading to sustainable improvements in nursing practice and healthcare delivery.

This finding is supported by studies such as **Panda et al. (2024) , Gisella & Zamralita (2024)** and **Zein, Hasibuan, & Jufrizen (2024)** which demonstrated a positive relationship between job crafting and innovative work behavior. Additionally, **Kaur & Rahmadani (2023)** and **Khan et al. (2021)** emphasizes that acquiring new skills through job crafting leads individuals to pursue innovative methods and solutions, thus promoting organizational innovation . However, contrasting results were reported by **Nathaniel & Dewi (2024)**, and **Rahmi et al. (2024),** who found no significant relationship between job crafting and innovative work behavior, suggesting that contextual factors may influence these outcomes.

Finally, the present study found a statistically significant positive correlation between nurses' knowledge, job crafting skills, and innovative work behavior. This may be explained by the fact that job crafting enhances autonomy, engagement, and ownership, which in turn promote creativity and innovation.

This finding aligns with the study by **Supriyanto et al. (2020),** which identified a reciprocal relationship between innovative work behaviour and job crafting in Indonesia. Building on this, **My Mekhael et al. (2023)** examined staff nurses and found a significant positive correlation between job crafting and innovative behaviour, further demonstrating the connection between how employees shape their jobs and their innovative capacities. Lastly, **Tomas et al. (2023)** highlighted the mutually reinforcing relationship between job crafting and innovative work behaviour in their three-wave study, showing that job crafting increases innovative behaviour and vice versa, indicative of a dynamic interplay between the two constructs across various organizational contexts.

Conclusion

The findings of the present study confirmed both hypotheses, showing that the job crafting intervention program significantly enhanced nurses' knowledge, skills, and innovative work behavior. These improvements were evident immediately after the intervention and sustained at the three-month follow-up, with the study group outperforming the control group. Additionally, the results indicate that job crafting is an effective strategy for fostering professional development and innovation among nurses.

Recommendation: Based on the findings of the present study, several recommendations for hospital administrators and nurse managers are proposed **:**

- Integrate structured job crafting training into leadership development programs for nurse managers to equip them with innovative strategies that motivate teams and reinforce job crafting behaviors among nursing staff**.**
- Enhance nurses' adaptive performance by promoting participation in job crafting–based interventions, especially within competitive healthcare environments focused on institutional improvement and process optimization**.**
- Foster a culture of innovation by highlighting its importance in nursing practice and providing innovation-oriented training opportunities to facilitate organizational transformation and ongoing improvement**.**
- Continuously develop nurses' understanding and practical application of job crafting principles through specialized training programs, workshops, and professional development courses aimed at enabling proactive role enhancement**.**
- Encourage nurses to engage in continuous learning, optimize work methods, and align their daily tasks with their strengths and professional interests to enhance efficiency, engagement, and innovative performance.

Conflict of interest

The authors confirmed that there is no any conflict of interest.

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