

Work Hazards Training Program and Its Effect on Quality of Work Life and Turnover Intention among Staff Nurses at Suez Canal University Hospital

*Naasa Hassan Mohammad 1, Yousef Waheeb 2, Wafaa Abd El-Azeem El-hosany 3,
Fathya Abdelrazek 4*

1. *Nursing Specialist at Nursing school, El-Sharkia Governorate, Egypt.*
2. *Professor of Community Medicine, Faculty of Medicine, Suez Canal University, Ismailia, Egypt.*
3. *Professor of Nursing Administration, Faculty of Nursing, Suez Canal University, Ismailia, Egypt.*
4. *Associated Professor of Nursing Administration, Faculty of Nursing, Suez Canal University, Ismailia, Egypt.*

Abstract

Background: Work hazards are confounding factors for staff and patient safety. Their management and its improvement are targets of the intended organization as World Health Organization and International Labour Organization for high quality of patients care and for improving quality of work live of nurses and their retention. That could be improved through training nurses on work-related hazards. Hence, this study aimed to assess work-related hazards training program effect on quality of nursing work life and turnover intention among staff nurses at Suez Canal University Hospital. **Methods:** The data of current study were collected at Suez Canal University Hospital from staff nurses using work-related hazards knowledge and practice questionnaires, quality of nursing work life questionnaire, and the anticipated turnover intention scale. The quasi-experimental design was applied to conduct this study. **Result:** Statically significant differences were found before and after the work-related hazards training program for the satisfied level of knowledge (20.7% before, 91.8% immediate post, and 83.7% at follow-up. The corresponding figures for actual hazards were (54.9% reported high scores before, 37.0% immediate post, and 44.0% at follow-up), preventive measures (28.6% before, 74.5% immediate post, and 67.4% at follow-up), quality of work life (83.2% before, 85.3% immediate post, and 88.0% at follow-up) and turnover intention (56.0% before, 50.5% immediate post, and 53.0% at follow-up). **Conclusion:** There is a significant improvement of knowledge and preventive measures practice of staff nurses regarding work hazards in addition to shrinking exposure level to actual hazards along with training program phases. The same positive effect of program was found regarding nursing turnover intention and quality of work life. **Recommendations:** Conducing regular and updated training program of each types of work hazards management for staff nurses is required. Also, the organizational intervention is endorsed for their management too.

Key words: Quality of work life, Preventive measures, Turnover intention, Work hazards.

1. Introduction

Nursing personnel are exposed to a broader range of occupational hazards than other health care workers due to the nature of nursing responsibilities, which include twenty-four interactions with patients and the performance of invasive and noninvasive nursing operations. Nurses who are exposed to numerous dangers are dissatisfied with their job or the supply of a low-quality work life, and they engage in withdraw behaviours such as turnover and absenteeism (Abd Rabo, 2020; Prajwal, 2020; Poku et al., 2021; Zhang, 2022).

These work hazards are possible or intrinsic properties of a product, process, or scenario that cause injury and are typically the result of employment (World Health Organisation and International Labour Organisation, 2020).

There are many types of workplace hazards, which are frequently found in a healthcare setup including biological hazards especially the infectious ones such as bacteria, viruses, fungi, and parasites; physical hazards which are commonly found in health facilities include radiation and noise; ergonomically hazards, such as manual lifting of patients; chemical hazards, such as exposure to

medications, solutions, gases, vapours, and particulate matter; accidental as exposure to slippery floor; psychosocial as factors causing stress or work conflicts (World Health Organization & International Labor Organization, 2020; Ministry of health in Egypt, 2020).

As a result, the most effective strategy to protecting nurses from occupational dangers is to improve nurses' working surroundings, which contribute to a high quality of work life for them. The quality of nursing work life is described as the degree to which nurses are capable to gratify important personal needs through their work experiences while accomplishing the institution's goals (Brooks & Anderson, 2005; Delira, 2019). Many factors have a negative impact on the quality of nursing work life. Security, work-life balance, control over workload, nursing lack of autonomy, job performance feedback, and a safe working environment have all been found as major predictors of nurse turnover intention (Tei-Tominaga, 2020; Poku et al., 2021).

Thus, the quality of nursing work life is connected with a number of good outcomes, including increased productivity and efficiency in the health-care system, improved

performance, increased employee empowerment, and a lower intention to leave nursing (Al Grad, 2020; Fronda & Labrague, 2022). Intent to leave is thought to be the most accurate predictor of nurse turnover and actual leaving, and it may be described as an employee's intention to plan to leave his current job in order to find another one he looks forward to in the near future (Weisberg, 1994). As a result, an unfavourable safety work climate perceived by nurses, as well as a low quality of nursing work life, are considered a contributing factor to nurse turnover intention, resulting in an ongoing nursing shortage and a high rate of nurse turnover. These are critical challenges for healthcare organisations, affecting several domains, from nursing service quality to organisational productivity (Tolksdorfeal,2020).

As a result, awareness of work risks and available work hazards management strategies contribute to a sense of job security, and its components operate as positive resources to improve the quality of work-life for nurses and minimise their intention to leave (Delira, 2019;Tolksdorfeal,2020).

Significance of the Study:

Nurses are unquestionably the largest

workforce in the healthcare system, accounting for an estimated 19.3 million of the world's 43.5 million health professionals (World Health Organisation, 2020). As a result, the quality of hospital services and patient care cannot be improved without the involvement of this workforce (Burmeister et al., 2019).

Furthermore, nursing is a unique profession that faces a variety of risks on a daily basis, and it is critical to focus on their quality of life in order to improve their work environment. Nurses must develop effective techniques to improve optimal health, nurses' quality of life, and their motivation to work (Albougami, 2020; Judi, 2021). As a result, it is critical to improve the safety climate in hospitals by providing nurses with training programmes on work hazards and, in particular, protective measures, which will improve nurses' quality of life at work, organisational commitment, productivity, and reduce nurse turnover.

The aim of this study:

It was to assess work-related hazards training program effect on quality of nursing work life and turnover intention among staff nurses at Suez Canal University Hospital.

Objectives of the study:

The objectives of this study were to:

- Assess knowledge and practice related to work hazards among staff nurses.
- Identify the perception of quality of nursing work life among staff nurses.
- Identify the turnover intention among staff nurses.
- Evaluate work-related hazards training program effect on quality of work life and turnover intention among staff nurses.

Research questions:

- Was there significance difference before and after work hazards training program in work-related hazards, and its knowledge and practice among staff nurses?
- Was there significance difference before and after work-related hazards training program in turnover intention and quality of work life among staff nurses?

Research hypothesis:

Work-related hazards training program causes improvement in hazards, and its knowledge and practice besides to in turnover intention and quality of work life

among nurses.

2. Subjects and methods

The methodology of the study was described according to the four following designs:

Technical Design

It includes research design, study setting, subjects, and tools of data collection.

Research design:

Quasi-experimental design was followed to carry out the current study.

Setting of the study:

The study was conducted at inpatient units(departments) at Suez Canal University hospital (Teaching Building), namely Neonatal Intensive Care Unit (NICU), Intensive Care Unit (ICU), Endoscopy Department, Isolation Department, Burns Department, Catheter Department, Obstetric Department, Surgery Department, Medical Department, Psychology Department, Neurological Department, Oncology Department, Ophthalmology Department, Pediatric Department and Orthopedics Department).

The sample of the study:

It included 184 staff nurses working at above setting. They were randomly selected after alphabetically arranging their names, then

every second staff was selected to be included in the study. The highest percentages of staff nurses were female (58.7%), married (79.9%), aged from twenty to thirty years old (79.9%) with mean age 33.42 ± 9.35 , and had technical institute (80.4%), with mean 8.73 ± 4.81 years of experience. Also, they had biological hazards training program compared to psychosocial hazards (57.1% & 11.4% respectively).

Tools for data collection

Data of the current study were collected through utilizing the following tools: Work-related hazards knowledge questionnaire, work hazards practice questionnaire, quality of nursing work life questionnaire, and the anticipated turnover intention scale.

Work hazards knowledge questionnaire:

This tool was developed by researcher, and composed of two parts. The first part was socio-demographic characteristics which include age, sex, marital status, educational qualifications, years of experience, and having training programs on work hazards. The second part had been developed after reviewing relevant literature and training program to assess nurse's knowledge about the various types of work hazards (**Russi,etal., 2017; Ramadan, 2018;**

Abubakar, 2019; World Health Organization & International Labor Organization, 2020). It contained 40 questions that were classified into seven parts: important of awareness of work hazards (3 items); biological hazards (8 items); chemical hazards (7items); physical hazards (4 items); ergonomic hazards (8items); Accidental hazards (3items); psychosocial (7items).

The scoring system:

The question scored (1) in case of correct answer, and (0) for wrong answer, summing into (40) as an overall score. If the total percent of knowledge was 60% or more, it reflected the satisfied level compared to less than 60% reflected the unsatisfied level (**Ali, 2015& Ramadan, 2018**).

Work Hazards Practice Questionnaire:

This questionnaire had been developed based on international hazard data sheet on occupation for nurses by **International Labor Organization & Occupational Safety and Health Information Center (1999), European Commission (2011), National Institute Occupational Safety and Health (2014), Ali (2015), Elewa (2016), and Eldessouki (2019)**. It was categorized into two parts:

a-Actual hazards work exposure: All work

hazards were assessed as if the staff have already passed with these hazards. This part was consisted of 30 statements categorized into 6 dimensions; accidental hazards (4 items), physical (4items), biological (5items), chemical (4items), ergonomic (5items) and psychosocial hazards (8items).

Scoring system:

Actual hazards was scored as (0) for No and (1) for Yes. The total score was (30), and considered high if the total percentage was 50% or more and low if less than 50% (**Ali, 2015**).

b-Preventive measures practice: This part was consisted of 37 statements categorized into 8 dimensions; protective clothing (6 items), hand washing policies (3 items), handling and disposable sharp equipment safety (4items), prevention musculoskeletal disorders (6 items), documentation and reporting (4 items) ,decreasing job stress (5 items) ,decreasing exposure to violence(4 items) and reviewing guidelines (5 items).

Scoring system:

It will be scored using 3-point scale (always, sometimes and rarely) ranged from (3) to (1), summing into (111) as an overall score. If the total percent of preventive measures was 75 % or more, it reflected the

satisfied level compared to less than 75% reflected the unsatisfied level (**Ramadan, 2018; Abd Rabou, 2020**).

Quality of nursing work life questionnaire:

This tool was developed by **Brooks (2001)** to measure the quality of work life among staff nurses. It contained 42 items categorized into 4 subscales: work life &home life; work design; work context; work world. This tool had been translated by **Almalki (2012)**.

Scoring system:

The scores of this tool ranged from (1) strongly disagree to (6) strongly agree, with an overall score (252). It was categorized into (42-112) representing low level; (113-182) representing average level; (183-252) representing high level quality of nursing work life (**Brooks, 2001**).

The anticipated turnover scale:

This tool was developed by **Hinshaw and Atwood (1984)** to study turnover intention among nurses. It was geared to indicate the probability of willingly terminating the present job. It contained 12 items. Also, this tool had been translated by **Almalki (2012)**.

Scoring system

The scores of this tool ranged from (1) strongly disagree to (7) strongly agree, with an overall score (84). Higher scores indicate a

more intent to leave the current job. If percent was > 50% were reflected as a sign of turnover intention (**Hinshaw and Atwood, 1984; Almalki, 2012**).

II. Operational design

The current study was conducted in five stages: preparation besides to tools validity & reliability and pilot study; pre-testing; program implementation; post-testing; follow-up. The study lasted approximately ten months, from November 2020 to September 2021.

Phase one: preparation phase:

After reviewing literatures regarding the study variables and their measuring tools, the researchers use these literatures to comprehend with the variables and preparing the knowledge and practice of work-related hazards questionnaires. Also, the work-related hazards training program was constructed. It included the concepts related to work-related hazards, their types, the preventive measures using by nurses to protect themselves against these hazards.

Phase two: pretest phase:

The data were collected before implementing the program, using the scheduled tools. They were distributed on contributed nurses, after having their

agreement to participate in the study and taking informant consent besides to explaining the aim, nature of the study and method of filling the questionnaire. Data collection was done individually or through group meetings.

Phase three: implementation phase:

In this stage, the training program of work hazards was provided to nurse. Numbers of sessions were sixteen sessions (8 hours) for each group. Before conducting the training program, the program strategy time, number of sessions, teaching methods and media used were determined. In addition, the teaching place and program facilities were checked for appropriateness. The program was implemented throughout the period of end of Mars 2021 to the end of May 2021 about two months, two days per week; each session took approximately thirty minutes. Two sessions were offered daily for each group. A total of 16 sessions with total 8 hours were conducted to cover the content. The participants were divided into six groups about (30-35 participants in group). Three groups nurse received program the first day and other three groups received program at the second day per week that abased on availability of participant for attendance and

the arrangement of nursing director. A variety of teaching methods used during the implementation of the program which were demonstration, group discussions, and brainstorming. Some sessions included application of new skills and techniques. Audio visual media were used, such as data show, white board, and the personal computer was used. The program was implemented in the biggest hall at the Suez Canal Hospital.

Phase four: posttest phase:

All tools of data collection were applied immediately after program implementation as an *immediate post phase* and after three months as a *follow up phase*.

Validity and reliability of the study tools:

Knowledge and work hazards practice questionnaires were revised for its content

Pilot study:

A pilot study was conducted on 10% of the study nurses to identify the obstacles and problems that may be encountered during data collection of the study in addition to checking

III-Administrative design:

Official permission was approved by the dean of faculty of nursing to the manager of Suez Canal university Hospital to conduct the study after clarifying the aim and the nature of the study.

validity after using back translation for its parts in accordance with their references. Both quality of nursing work life questionnaire and the anticipated turnover scale were tested for their validity and reliability in their original studies with internal consistency reliability (0.89, 0.90 respectively) in **Almalki (2012)**.

The study's tools were examined for their reliability by measuring the internal consistency of items using Cronbach's alpha coefficient test. They were proved reliable scores, where it was 0.830 for work hazards knowledge questionnaire, 0.820 for actual hazards exposures, 0.923 for preventive measures, 0.948 for quality of nursing work life and questionnaire, and 0.955 for turnover intention scale.

the applicability and feasibility of tools. Nurses who participated in pilot study were excluded from the study sample. The pilot study assured on the applicability of tools for data collection for the study situation.

Ethical considerations:

After explaining the aim of the study and expected benefits from it for the staff nurses, the informed consent was taken from them. The anonymity and confidentiality of the participants in addition to availability to

withdraw from the study at any time were assured too.

IV-Statistical design:

Data entry and statistical analysis were carried out using the SPSS version 22. The Cronbach alpha coefficient was applied to determine the dependability of the tools based on the internal consistency. The McNemar and Friedman test were used to determine the significant differences in the studied variables along with the pre, post and follow up phases of the training implementation. P-values < 0.05 were regarded statistically significant, whereas p-values < 0.01 were deemed highly significant.

3. Results:

Table (1) illustrates knowledge about work hazards among staff nurses along with phases of the training program. It was found that the highest percentage of nurses had a satisfied level of knowledge about biological hazards (96.2%&93,5%) compared to knowledge of them about psychosocial hazards(79.3%& 69.6%) at immediately post and follow up program respectively. Also, it was found that total knowledge scored its highest satisfactory level at immediately post and follow-up phases compared to pre phase

of training program with statistically significant difference along with phases of the training program.

Table (2) describes actual work hazards exposure among staff nurses in study group with along phases of the training program. It was found that actual exposure level of chemical hazards scored the highest percentage (91.8%) at pre phase compared to immediately post follow –up phases of training program (58.2%&65.2% respectively), followed actual exposure level of ergonomic hazards scored percentage (84.8%) at pre phase immediate compared to post follow –up phases of training program (46.2% & 52.2% respectively). Totally, it was found that actual hazards scored its highest percentage at pre phase (54.9%) compared to immediately post follow –up phases of training program (37.0% 44.0% respectively), with statistically significant difference between pre and immediately post phases beside immediately post and follow up phases of the training program

Table (3) illustrates preventive measures practice among staff nurses along with phases of the training program. It was found that the highest percentage of nurses had

satisfactory level about handling and disposable sharp equipment safety (89.1% & 52.2% respectively), followed by hand washing policies (71.2% & 75.5% respectively) at immediately post and follow up program respectively). Totally, it was found that preventive measures practice scored its highest satisfactory level at immediately post and follow-up phases compared to pre phase of training program with statistically significant difference along with phases of the training program.

Table (4) shows quality of nursing work life among staff nurses along with phases of the training program. It was found that the highest percentage of nurses recorded high level toward work context (51.0% & 55.5%) compared to work world (2.7% & 5.4%) at immediately post and follow up program respectively. Totally, quality of nursing work life scored its highest percentage at average level with a statistically significant difference between pre phases and post phase beside pre and follow up phases.

Table (5) shows turnover intention among staff nurses along phases of training program. It was found that intent to leave scored its highest percentage at pre phase (56.0%) compared to immediately post follow-up

phases of training program (50.5% & 53.0% respectively), with a statistically significant difference between pre phases and post phase beside pre and follow up phase.

4. Discussion

Work hazards are confounding factors for staff and patient safety that the intended organization as World Health Organization and International Labour Organization targeted for high quality of patients care and for improving staff nurses retention. This could be achieved through increasing staff awareness regarding work-related hazards and their protective measures of them **(Rafique, 2019; Abd Rabou, 2020)**.

Regarding knowledge about work hazards among staff nurses in study group along with phases of the training program, it was found that the highest percentage of nurses had a satisfied level of knowledge about biological hazards compared to knowledge of them about psychosocial hazards at immediately post and follow up program. This result may be nurses, interesting with biological hazards especially the period of covid 19 pandemic. While psychosocial hazards are wide topic (as violence, shift work, stress and burnout beside social aspect so this hazards) which need a long time and specific training program to

have improvement in knowledge. This finding supported by **Ramadan (2019)** who indicated that psychosocial hazards scored the lowest percentage after program compared to other hazards.

Totally, knowledge scored its highest satisfactory level at immediately post and follow-up phases compared to pre phase of training program with statistically significant difference along with phases of the training program. This may be as result of effect of the training program on staff nurses about work hazards that they know less about it before. In this regard, the present study agrees with **Abd Rabou (2020)** who reported that there is an enhancement in nurses' knowledge satisfaction after application of the training program about hazards of occupation and protection from them (**Ramdan, 2019**).

Regarding actual hazards exposure among staff nurses in study group along with phases of the training program, it was found that actual exposure level of chemical hazards scored the highest percentage at pre phase compared to immediately post follow up phases of training program, followed actual exposure level of ergonomic hazards scored percentage at pre phase immediate compared to post follow up phases of training program.

This may be due to the effective use of chemical agents and other disinfectants during covered period beside to wearing gloves along day of work in addition to other preventive measure practice as result of training program.

The same was done for ergonomic work hazards as result of training program which including training the staff on preventive measures contributing to ergonomic hazards, that as correct application of handling patient technique and using bod mechanic. Also, the biological hazards had been decreased because of nurse awareness regarding biological hazards and how to manage them during training program.

The psychological hazards exposure is the only type of hazards which had no significance along phases of the training program. This may be as result of highly stressful impact of coved 19 pandemic on staff nurses who need more psychosocial supportive actions beside more social, managerial professional and organizational support to limit the psychosocial hazards exposure (**Karanikola,2022**).

Regarding total actual hazards exposure among staff nurses along with phases of the training program, the present study revealed

that, actual work hazards exposure level were low in post immediately and follow-up program compared to preprogram phase with statistically significant difference between pre and immediately post phases beside immediately post and follow up phases of the training program among nurses. This result mean that work hazards training program causes improvement among nurses especially immediate post rather than follow up phases of training program that indicates to the improvement effect of work hazard training program immediately post phase. In this regard, **Elbilgahy (2019)** clarified that follow up the occupational and safety nursing guidelines significantly improved their safety from hazards facing health care worker especially nurses. This is supported by **Charpe (2020)** who assured on the need for required, guidelines and interventions which should be provided to minimize the hazards exposures.

Regarding preventive measures practice among staff nurse along with phases of the training program, the findings of present study revealed that the highest percentage of nurses had satisfactory level about handling and disposable sharp equipment safety followed by hand washing policies at

immediately post and follow up program. This is due to implementing training program which including how handling all preventive measures to manage work hazards. In this regard, **Gupta (2017)** revealed that it is regular adequate training and awareness about sharps injuries is important for protecting nurses and elimination their exposure to infectious disease. In addition, the current study result showed that personal protective equipment is only preventive measure which has no statistically significant difference along with phases of the training program. This may be finding as a result of COVID-19 pandemic percussion procedures which was a strict policy followed by all health care setting.

Totally, preventive measures among staff nurses scored its highest satisfactory level at immediately post and follow-up phases compared to pre phase of training program with statistically significant difference along with phases of the training program. That indicates to effectiveness of training program in improving safety measure. These findings were supported by **Elewa and El- Banan, (2016)** who indicated to the significant correlation between protective measures and occupational hazards knowledge among

nurses. Beside, **Ramdan (2019)** who assured on the improvement of nurses in practices of following program implementation after program. In the same line **Rayan (2021)** illustrated highly significant differences of total practice of preventive measures among staff nurse throughout program phases was observed.

Regarding quality of nursing work life among staff nurses. It was found that the highest percentage of nurses recorded high level toward work context at immediately post and follow with statistically significant difference between pre phases and post phase beside pre and follow up phase compared to work world with no statistically significant difference along phases of training program. The current work context result may be due to that many aspect of working conditions have been better through work hazards management by nurses when following safety measures of occupational hazards prevention. Whereas, the work world that is related to nurses salary which could be dissatisfied for nurses could not be affected by training program on work hazards (**Albougami et al., 2020**).

Totally, there were a statistically significant difference toward quality of work life

between pre phases and post phase beside pre and follow up phase among staff nurses. The significant difference among training program phase is reflected to the effect of the training program on quality of work life of the studied nurses **Abd El-Rasol (2018)**. This is supported by **Abd Rabou (2020)** who reported that there is significant positive association between quality of nursing work life and knowledge regarding workplace throughout intervention phases.

Regarding turnover intention among nurses along phases of training program, the study showed that the turnover intention decrease in post immediately and follow up compared to pre phases of training program with a statistically significant difference between pre and post phases beside to pre and follow-up phases .

This result may be as result of effective of training program which lead to increased knowledge and preventive measures practice of nurses which help them to deal with these work hazards correctly providing supportive work environment. In this regard, **Frona and Labrague (2020)** who mentioned that generating a proper supportive environment for personnel, and providing suitable protecting equipment to prevent infection

with COVID-19 are unconditionally vital to safety climate enhancement, thereby reducing turnover intention and improving retention by decreasing nurses stress (Poku, 2022). This is supported by Sasso et al. (2019) who illustrated that individuals who were exposed to higher levels of workplace hazards were high risk for turnover intention compared to those exposed to lower levels of workplace hazards.

Also, this assures the needs of organizational intervention to manage work hazards and turnover. Other determinant factor, It is the COVID-19 pandemic itself and its unfavorable safety climate with highly stressful situation in nursing care and health care industry as a whole. It is affecting the work hazards, quality nursing work life and turnover intention that already have had negative consequence on health, work and life movement.

This is results in accordance with the study conducted by Fronda and Labrague (2020) who illustrated the COVID-19 pandemic is associated with high workload, frequency of absenteeism, increase levels of burnout, and turnover intention and low quality nursing work life among nurses. Overall, there was turnover intention among nurses. Hence, there

is a need for providing adequate support, incentives, and other forms of motivation for nurses by policymakers, health administrators, and nurse managers to implement required strategies for reducing the turnover rate and improving quality of nursing work life (Boateng, 2022).

5. Conclusion

Grounded on the outcomes of the current study, it is concluded that there is a significant improvement of knowledge and preventive measures practice of staff nurses regarding work hazards in addition to shrinking exposure level to actual hazards along with training program phases. The same positive effect of program was found regarding nursing turnover intention and quality of work life. Besides, there is a need to organizational intervention for more work-related hazards management.

6. Recommendations

Conducing regular and updated training program of each types of work hazards management for staff nurses

Each type of work hazards management guideline should be written briefly and published in form of posters at hospital.

Hospital administrators must motivate their staff for keeping safety measures; support giving safety nursing and health care; provide supplies and equipment; observe and supervise nurses' practices to ensure their compliance with safety regulations; save psychological support and empowerment.

Taking measures for biological hazards prevention through: performing regularly routine check-up of nurse to ensure

occupational health; providing regular vaccination for all nurses to minimize liability for acquiring work related infection.

Also, taking measures regarding supporting chemical and ergonomic hazards management procedures. Conducting reporting system for hazards facing health care worker especially nurses to improve their safety and commitment to the health care setting.

Table (1): Knowledge regarding work hazards among staff nurses along with phases of the training program (N=184).

Items	Pre-test		Immediate post-test		Follow-up		# p-value		
	No.	%	No.	%	No.	%	Pre/ Immediate post-test	Immediate post-test/ Follow-up	Pre/ Follow-up
Work hazards importance									
Satisfactory	67	36.4	175	95.1	170	92.4	.000*	.036*	.000*
Unsatisfactory	117	63.6	9	4.9	14	7.6			
Biological hazards									
Satisfactory	76	41.3	177	96.2	172	93.5	.000*	.032*	.000*
Unsatisfactory	108	58.7	7	3.8	12	6.5			
Chemical hazards									
Satisfactory	48	26.1	147	79.9	139	75.5	.000*	.005*	.000*
Unsatisfactory	136	73.9	37	20.1	45	24.5			
Physical hazards									
Satisfactory	60	32.6	146	79.3	131	71.2	.000*	.081	.000*
Unsatisfactory	124	67.4	38	20.7	53	28.8			
Ergonomic hazards									
Satisfactory	37	20.1	165	89.7	156	84.8	.000*	.035*	.000*
Unsatisfactory	147	79.9	19	10.3	28	15.2			
Accidental hazards									
Satisfactory	108	58.7	160	87.0	153	83.2	.000*	.005*	.012*
Unsatisfactory	76	41.3	24	13.0	31	16.8			
Psychosocial hazards									
Satisfactory	45	24.5	146	79.3	128	69.6	.000*	.057	.000*
Unsatisfactory	139	75.5	38	20.7	56	30.4			
Total knowledge									
Satisfactory	38	20.7	169	91.8	154	83.7	.000*	.050*	.000*
Unsatisfactory	146	79.3	15	8.2	30	16.3			

Macnemar test* : Statistically significant at $p < 0.05$

Table (2): Actual Work hazards exposure among staff nurses along with phases of the training program (N=184).

Items	Pre-test		Immediate post-test		Follow-up		# p-value		
	No.	%	No.	%	No.	%	Pre/ Immediate post-test	Immediate post-test/ Follow-up	Pre/ Follow-up
Biological hazards									
High	95	51.6	45	24.5	85	46.2	.000*	.000*	.000*
Low	89	48.4	139	75.5	99	53.8			
Ergonomic hazards									
High	156	84.8	85	46.2	96	52.2	.000*	.012*	.000*
Low	28	15.2	99	53.8	88	47.8			
Accidental hazards									
High	41	22.3	34	18.5	32	17.4	.322	.015*	.004*
Low	143	77.7	150	81.5	152	82.6			
Chemical hazards									
High	169	91.8	107	58.2	120	65.2	.001*	.000*	.000*
Low	15	8.2	77	41.8	64	34.8			
Physical hazards									
High	38	20.7	28	15.2	38	20.7	.005*	.571	.001*
Low	126	68.5	156	84.8	146	79.3			
Psychosocial hazards									
High	118	64.1	103	56.0	113	61.4	.366	1.0	.440
Low	66	35.9	81	44.0	71	38.6			
Total actual hazards									
High	101	54.9	68	37.0	81	44.0	.000*	.021*	.097
Low	83	45.1	116	63.0	103	56.0			

Macnemar test* : Statistically significant at $p < 0.05$

Table (3): Preventive measures practice among staff nurses along with phases of the training program (N=184).

Items	Pre-test		Immediate post-test		Follow-up		# p-value		
	No.	%	No.	%	No.	%	Pre/ Immediate post-test	Immediate post-test/ Follow-up	Pre/ Follow-up
Personal protective equipment									
Satisfactory	120	65.2	120	65.2	125	67.9	1.0	.556	.556
Unsatisfactory	64	34.8	64	34.8	59	32.1			
Hand washing policies									
Satisfactory	85	46.2	131	71.2	139	75.5	.000*	.874	.000*
Unsatisfactory	99	53.8	53	28.8	45	24.5			
Handling and disposable sharp equipment safety									
Satisfactory	96	52.2	164	89.1	153	83.2	.000*	.082	.000*
Unsatisfactory	88	47.8	20	10.9	31	16.8			
Prevention musculoskeletal disorder									
Satisfactory	6	3.3	66	35.9	54	29.3	.000*	.059	.000*
Unsatisfactory	178	96.7	118	64.1	130	70.7			
Documentation and reporting									
Satisfactory	46	25.0	100	54.3	89	48.4	.000*	.034*	.000*
Unsatisfactory	138	75.0	84	45.7	95	51.6			
Decreasing jobs stress									
Satisfactory	19	10.3	61	33.2	54	29.3	.000*	.440	.000*
Unsatisfactory	165	89.7	123	66.8	130	70.7			
Decreasing exposure to violence									
Satisfactory	26	14.2	87	47.3	85	46.2	.000*	.171	.000*
Unsatisfactory	157	85.8	97	52.7	99	53.8			
Reviewing guidelines									
Satisfactory	19	10.3	64	34.8	67	36.4	.000*	.841	.000*
Unsatisfactory	165	89.7	120	65.2	117	63.6			
Total practice									
Satisfactory	48	26.1	137	74.5	124	67.4	.000*	.033*	.000*
Unsatisfactory	136	73.9	47	25.5	60	32.6			

Macnemar test *: Statistically significant at $p < 0.05$

Table (4): Quality of nursing work life among staff nurses along with phases of the training program (N=184).

Items	Pre-test		Immediate post-test		Follow-up		# p-value		
	No	%	No	%	No	%	Pre/ Immediate post-test	Immediate post-test	Pre/ Follow-up
Work home& life									
Low									
Average	37	20.1	7	3.8	4	2.2	.000*	.752	.000*
High	126	68.5	140	76.1	153	83.2			
	21	11.4	37	20.1	27	14.7			
Work design									
Low							.000*	.847	.000*
Average	20	10.9	2	1.1	3	1.6			
High	155	84.2	172	93.5	176	95.7			
	9	4.9	8	4.3	5	2.7			
Work context									
Low							.000*	.655	.000*
average	12	6.8	0	0.0	3	1.6			
High	88	47.8	90	48.9	79	42.9			
	84	45.4	94	51.0	102	55.5			
Work world									
Low							.128	.553	.414
Average	24	13.0	11	6.0	13	7.1			
High	151	82.1	168	91.3	161	87.5			
	9	4.9	5	2.7	10	5.4			
Total quality									
Low							.028*	.559	.010*
Average	19	10.3	5	2.7	10	5.4			
High	153	83.2	157	85.3	162	88.0			
	12	6.8	22	12.0	12	6.5			

#Friedman Test *: Statistically significant at $p < 0.05$

Table (5): Turnover intention among staff nurses along with phases of the training program (N=184).

turnover	Study groups N = 184						# p-value		
	Pre-test		Immediate post-test		Follow-up		Pre/Immediate post-test	Immediate post-test/Follow-up	Pre/Follow-up
	No.	%	No.	%	No.	%			
Intent	103	56.0	93	50.5	96	53.0	.027*	.068	.030*
No intent	81	44.0	91	49.5	85	47.0			

Macnemar test

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*mar test**: Statistically significant at $p < 0.05$