Effect of Training Program about Maintenance of Healthy Work Environment on Nurses' Engagement, at King Fahad Specialist Hospital, Buraydah, Saudi Arabia

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Abstract:

Background: *The impact of a healthy work environment on work engagement is often mediated by basic psychological needs and organizational commitment. When nurses' psychological needs for autonomy, competence, and relatedness are met, their engagement levels increase significantly.* ***Aim of the study:*** *to determine the effect of training program about maintenance of healthy work environment on nurses' engagement, at King Fahad Specialist Hospital, Buraydah, Saudi Arabia.* ***Method:*** *A quasi-experimental one group with pretest-posttest was utilized, in all departments of King Fahad Specialist Hospital, Saudi Arabia included both (n=102) head nurses/ nurses' managers and staff nurses (n=121) using Healthy Work Environment knowledge questionnaire and Work Engagement Scale.* ***Results:*** *the knowledge distribution from predominantly low level (72.5%) before training to predominantly high level (96.1%) immediately after training. Regarding total Work Engagement level, more than half (60.3%) had low level before training, the progression of total engagement scores across the three assessment points: before training (42.84), immediately after training (78.11), and after 3 months follow up (60.59).* ***Conclusion:*** *it was concluded that the training program significantly enhanced both Healthy Work Environment Knowledge among head nurses and Work Engagement among staff nurses in Saudi Arabia, with immediate post-training assessments demonstrating substantial improvements from baseline levels.* ***Recommendations:*** *Actively participate in all training programs and workshops related to healthy work environments and professional development to enhance knowledge and engagement levels*

Keywords: *Engagement, Healthy Work Environment, Maintenance, Nurses.*

Introduction

Positive and caring work environments for health professionals, especially nurses, are critical inside their health organisations. A positive work environment is critical to the improvement of the recruitment and retention of healthcare personnel, particularly nurses, and to an organization's financial health. Optimal work environments that support the health and wellbeing of nurses are critical to excellent organisational performance and positive patient and societal outcomes. A healthy work environment (HWE) for nurses is essential to increase job satisfaction, reduce burnout, and improve patient care outcomes (Andrews & Haskell, 2024). It consists of various elements that create an inviting, empowering, and safe space for nurses to thrive personally and professionally. An open culture promotes nurses' ability to voice concerns and share ideas, which leads to improved decision-making and problem-solving (Wang, et al., 2024) .

Good leadership is required to create and preserve a good working environment. Leaders should promote professional independence, support nursing workers in their work and promote teamwork. Good leadership requires acknowledging nurses' accomplishments and providing them with opportunities for career advancement (Sarıköse and Göktepe, 2022). The cooperative atmosphere boosts the morale and motivation of the nursing staff. Nurses can encourage teamwork to share the workload, lower their stress levels and improve the quality of care provided to patients. Nurses should have the liberty to make decisions on patient care without undue constraints. The autonomy gained improves job satisfaction and provides nurses with the power of their duties (Sherwood, et al., 2024). An optimal working environment is one that respects the physical safety of nurses by minimizing hazards at the workplace and providing the necessary resources. Also, emotional safety is important. A supportive environment reduces the stress and burnout levels of nursing staff. Acknowledgment of nurses' efforts and achievements provides a sense of value to the organization. Significant recognition can increase motivation and job satisfaction, and decrease turnover rates (Kohnen, et al., 2024) .

A good work environment has a number of benefits for instance improved job satisfaction, better patient care and less burnout. Supportive environments within healthcare organisations have been linked to increased job satisfaction and retention (Donley, 2021). Healthy environments have been correlated with improved patient outcomes (Bruyneel, et al., 2024) .

Good communication, strong leadership, teamwork, autonomy, safety and recognition are the hallmarks of a healthy work environment. These aspects improve not just the well-being of nurses, but also greatly improve patient care outcomes and organisational effectiveness. There is increasing study on the association between a healthy work environment (HWE) and nurses' engagement, which shows the influence of work conditions on the nursing staff's commitment and motivation (Santos, et al., 2021) .

Research has also shown a beneficial relationship between work atmosphere and job engagement among nurses. Factors like as strong leadership, effective communication and collaborative relationships increase the level of participation. Basic psychological needs and organisational commitment often enable the effect of a favourable work environment on employee engagement. When nurses' psychological needs for autonomy, competence and relatedness are met, their involvement is significantly increased (Labrague, et al., 2022) .

Good leadership is key to a pleasant work environment. Supportive leaders and collaboration can improve nurses' job satisfaction and commitment to their jobs. A good work environment is associated with job satisfaction, which is associated with lower turnover intentions among nurses. Better perceptions of the work environment of nurses are linked to higher levels of engagement and commitment to the organization. A positive work environment results in an increase of the psychological capital and consequently in increased engagement of the nursing staff (Mancin, et al., 2024) .

Nurses' role is a key part of the healthcare system that has a huge impact on employees' satisfaction and patients' results. It means the emotional and intellectual commitment of nurses to their profession, organisation and job. Higher involvement is associated with better performance at work, lower turnover and higher quality of patient care (McKenna & Jeske, 2021) .

Engagement of nurses Commitment of a nurse to the job and the organisation, frequently expressed by the excitement, devotion and absorption in the duties of the nurse. It is a continuous and pervasive mental state, which includes psychological involvement, energy and work participation (Zeng, et al., 2022). Nurses that are engaged tend to be more satisfied with their job, less burned out and less likely to leave their employment. This is a benefit for the nurses and it increases the quality of treatment for patients. More engaged nurses tend to be more involved in decision making, work well with colleagues and hence

achieve better organisational outcomes. Engaged nurses tend to be associated with improved workforce outcomes including lower staff turnover, lower burnout and increased job satisfaction (Mukhlis, et al., 2022). Nurses who have professional autonomy and are involved in decision making in relation to patient care are more likely to be engaged. An environment of support, cooperation and collaboration between professional groups builds a sense of belonging and commitment of the nursing staff. Responsive leadership that understands the issues facing nurses can make a major difference in engagement level increases. Increased nurse involvement with care correlates with better patient safety ratings, lower hospital mortality rates, and increased financial viability for healthcare organizations (Zhang et al., 2022). When nurses are committed to the organization, the organizational culture improves and the work environment becomes more supportive. Recognition of nurses' work and the provision of adequate resources could improve morale and participation levels. Training and development opportunities encourage nurses to participate in their professions and feel that they are vital members of the business. Moreover, nurses' commitment to their job is strengthened by building trust via clear communication and helpful behaviours (Nie, Yue, Peng, Zhou, Li, & Cao, 2024) .

Nurses may be involved in health systems through advisory boards, unit councils and several committees at a hospital. Increased involvement of nurses in multidisciplinary and cross-departmental activities is thought to help align institutional objectives and policies with patient care needs by actively involving the people who have the most interaction with patients and families (Morales-García, et al., 2024).

Significance of the Study

The work environment of nurses in Saudi Arabia has increasingly received attention due to high absenteeism and shortages of nursing staff, augmented by dramatic cutbacks and restructuring of healthcare services (Alluhaybi, Usher, Durkin, & Wilson, 2024). The restructuring led to forced layoff of large numbers of nurses in short time periods, higher nurse/patient ratios, reduced professional and clinical support, and an increase in non-nursing tasks for nurses. These developments led to deteriorated work environments for nurses, and many nurses are retiring early or leaving the profession because of stressful working conditions (Abou Hashish, Alsayed, Alnajjar, & Bakar, 2024).

Fully engaged nurses have an emotional and intellectual

connection to their hospitals and care about the success of their workplace. They have fewer voluntary absences and are always looking for ways to improve the quality of their patient care. By contrast, an unengaged nurse is one who does the bare minimum of the job requirements and is ambivalent to the success of their hospital. The study found that overall, 14.4% of hospital nurses themselves as feeling 'unengaged' in their jobs. (BowenXue, et al., 2024). Therefore, the aim of this study will evaluate the effect of training program about maintenance of healthy work environment on nurses' engagement, at King Fahad Specialist Hospital, Buraydah, Saudi Arabia

Aim of the study

This study aims to determine the effect of training program about maintenance of healthy work environment on nurses' engagement, at King Fahad Specialist Hospital, Buraydah, Saudi Arabia

Research hypotheses:

H_1. The head nurses' knowledge level regarding healthy work environment improves after implementing the training program.

H_2. The staff nurses' engagement improves after implementing the training program.

Method

Study Design:

A quasi-experimental one group with pretest-posttest was utilized in conducting the study (Cham, Lee, & Migunov, 2024).

Setting:

The study was conducted in all departments of King Fahad Specialist Hospital, Saudi Arabia.

Participants of the study:

Sampling: A purposive sample was utilized which included both (n=102) head nurses/ nurses' managers who responsible for the human resources in the setting and staff nurses (n=121) who were responsible to providing patients care in all above-mentioned settings and who fulfilled the criteria of having at least one-year of experience of work and available at time of data collection, and willing to participate in the study.

Tools of data collection:

Three tools were used to collect data pertinent to the study

Tools I: Healthy Work Environment knowledge questionnaire:

It consisted of two parts:

Part 1: The first part was include personal data and job characteristic data sheet of the studied head nurses as age, gender, marital status, year of experience in unit, last educational level, type of hospital, presence of previous training in healthy work environment.

Part 2: Healthy Work Environment Knowledge Questionnaire

This was a self-administered questionnaire sheet that was developed by researcher based on reviewing related literature to assess head nurses' and/or nurses mangers knowledge of the work environment before and after the training program. It consisted of questions in the form of true and false and multiple choices questions related to the healthy work environment, the questions were scored as (1) if correct answers, and (zero) if incorrect answers.

Knowledge level was classified into;

- Low level (<60% of total scores),
- Moderate level (60-75% of total scores)
- High level (>75% of total scores).

Tool (II): Work Engagement Scale

It consisted of two parts:

Part 1: The first part was include personal data and job characteristic data sheet of the studied staff nurses as age, gender, marital status, year of experience in unit, last educational level.

Part 2: Work Engagement Scale

The long version validated by Seppälä, et al (2009). It is a 17-item scale, consisting of 3 dimensions, vigor, dedication and absorption. Vigor" is measured with six items, "dedication" with five items, and "absorption" with six items. All items were scored on a 7-point Likert scale ranging from 0 ("Never") to 6 ("Always")

Work Engagement Scale was classified into;

-
- Low level (<60% of total scores),
- Moderate level (60-75% of total scores)
- High level (>75% of total scores).

Validity and reliability:

The face and content validity of the instruments was examined by the specialists in the field of study and the necessary change was done appropriately. Testing of Reliability: Cronbach alpha test was used to

examine the reliability of the instruments in Statistical Package for social Science (SPSS) version 23. The dependability of the instrument is estimated by determining the extent to which items of the same construct provide similar findings. In other words, the estimates examine the consistency of findings for different items that measure the same construct inside the measure.

Pilot study

A pilot study was performed on 10% (n=102) head nurses/nurses' managers and (n=121) staff nurses of the research participants to test and guarantee the clarity and feasibility of the tools and to calculate the time needed to complete the filling in of the questionnaires. Participants in the pilot research will not be included in this study. It is done to identify the difficulties and problems which can be faced during the data collection and appropriate changes are made.

Data collection process:

The Faculty of Nursing, Mansoura University, sent an official letter to the director of the chosen hospital to perform the study. Formal official permission to conduct the study was obtained by the director of King Fahad Specialist Hospital in Buraydah, Saudi Arabia, after a full explanation of the study aim.

Study tools were provided at baseline (before implementation of the training programme), immediately after implementation, and three months after implementation. This phase was the pretest for the study and involved collecting data. Based on the data collected and the analysis of the literature, the researcher was constructing a training programme for the preservation of a healthy work environment for head nurses.

Small groups of head nurses were formed and the Healthy Work Environment training programme was carried out. Each group has a contingent of nurses for the training implementation, depending on availability and workload. The educational methods were brainstorming, lectures, films, group discussions, and written handouts that were prepared by the researcher and distributed to the participants. At the end of the training programme, the three data collection instruments were handed out to the participants. The researcher did a follow-up of the planned progress after the Healthy Work Environment training programme using the same data collection instruments and compared the post-test results with the baseline data collected from the pretest assessment.

Data collection procedure:

Baseline data collection.

All eligible nurses were invited to participate in the study prior to the start of the training programme.

The participants were asked to complete the Healthy Work Environment Questionnaire and the Nurse Engagement Scale.

Intervention:

The training plan for ensuring a healthy work environment was prepared and delivered for the participating head nurses and nursing supervisors. The training programme covered themes relating to a healthy work environment.

Data Collection after Intervention:

At the end of the training programme, participants completed the same healthy work environment questionnaire and nurse engagement scale.

Ethical consideration:

Ethical approval was received from the Research Ethical Committee, Faculty of Nursing, Mansoura University. Data collection was approved by King Fahad Specialist Hospital, Buraydah, Saudi Arabia. Written informed consent was taken from the participants, staff nurses who met the inclusion criteria to complete in the questionnaires and be included in the study. Data were collected by the researcher and the goal of the study was explained to all participants who agreed to participate in the study. The anonymity and confidentiality of the information of the participants was fully guaranteed. The right to voluntary participation and disengagement from the study at any time will also be assured.

Data analysis

Data coding, data entry and data analysis was performed using SPSS 23 or above. The sample demographics were reported as frequent interruption, mean, standard deviation and percentile. The t-test and Pearson correlation coefficient were used to analyse correlations among variables. Differences between variables were tested for statistical significance using T- and ANOVA-tests. The correct regression test was used and it was statistically significant at 0.05. Scores on the Healthy Work Environment Questionnaire and Nurse Engagement scale pre- and post-intervention were compared using paired t-tests or Wilcoxon signed-rank tests. To determine the impact of healthy work environment changes on nurses' engagement, correlation analysis was carried out.

Results

Table (1): Personal characteristics of the studied head nurses in Saudi Arabia.

Personal characteristics	The studied head nurses (n=102)	
	n	%
▪**Age years**		
20-<30	19	18.6
>30-<40	81	79.4
40-41	2	2.0
Range	21-41	
Mean± SD	32.54±5.28	
▪**Sex**		
Male	24	23.5
Female	78	76.5
▪**Experience years**		
<1	3	2.9
1-< 5	16	15.7
>5-<10	46	45.1
≥10	37	36.3
Mean± SD	11.88±3.40	
▪ **Educational level**		
Diploma in nursing	16	15.7
Technical Institute of nursing	82	80.4
Bachelor degree	4	3.9
▪ **Marital Status**		
Married	91	89.2
Single	8	7.8
Divorced	3	2.9
▪ **Presence of previous training**		
Yes	65	63.7
No	37	36.3

Table (1): shows the personal characteristics of the studied head nurses in Saudi Arabia (n=102). It was observed that the majority (79.4%) were aged from >30-<40 years with a mean age of 32.54±5.28 years, and only (2.0%) were aged 40-41 years. Regarding sex, more than three-quarters (76.5%) were. Concerning experience years, nearly half (45.1%) had >5-<10 years of experience, followed by (36.3%) with ≥10 years, (15.7%) with 1-<5 years, and only (2.9%) with <1 year, with a

mean experience of 11.88±3.40 years. Regarding educational level, the vast majority (80.4%) had Technical Institute of nursing qualification, while only (3.9%) had Bachelor degree. As for marital status, the majority (89.2%) were married, (7.8%) were single, and (2.9%) were divorced. Regarding previous training, nearly two-thirds (63.7%) had previous training while (36.3%) had no previous training.

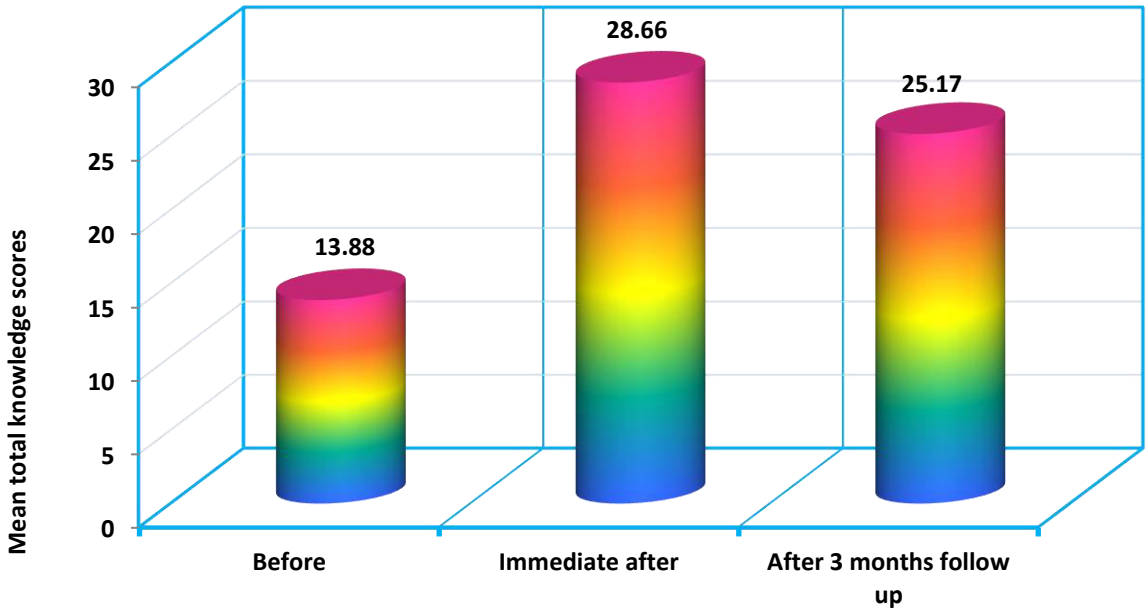


Figure (1): Total Healthy Work Environment Knowledge mean scores among the studied head nurses in Saudi Arabia before and after training program.

Figure (1): presents the total Healthy Work Environment Knowledge mean scores among the studied head nurses in Saudi Arabia before and after training program. The figure clearly shows the progression of knowledge scores across the three assessment points: before training (13.88), immediately after training (28.66), and after 3 months follow up (25.17), demonstrating the training program's effectiveness with some knowledge decline over time.

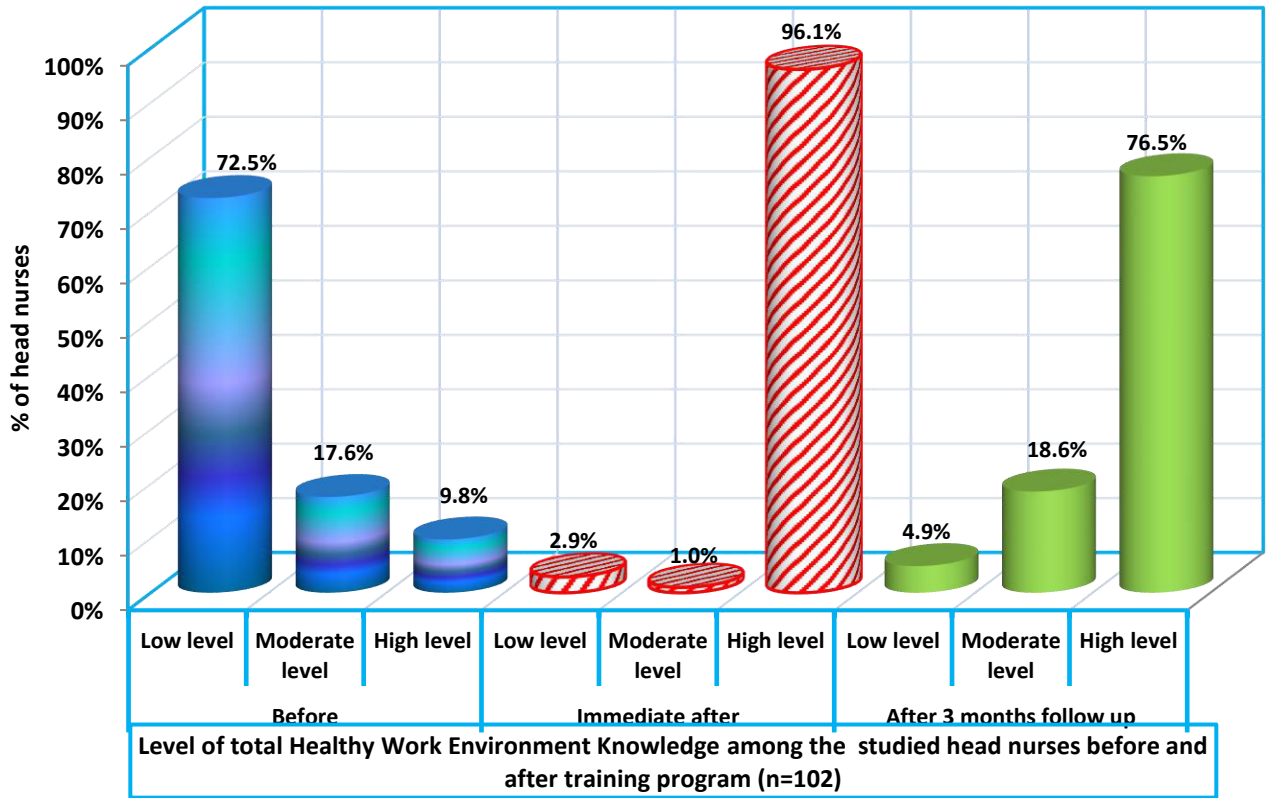


Figure (2): Level of total Healthy Work Environment Knowledge of the studied head nurses in Saudi Arabia before and after training program.

Figure (2): presents the level of total Healthy Work Environment Knowledge of the studied head nurses in Saudi Arabia before and after training program. The figure clearly demonstrates the shift in knowledge distribution from predominantly low level (72.5%) before training to predominantly high level (96.1%) immediately after training, with maintenance of high level (76.5%) at 3 months follow up, indicating sustained training effectiveness.

Table (2): Personal characteristics of the studied staff nurses in Saudi Arabia.

Personal characteristics	**The studied nurses (n=121)**	
	n	**%**
▪Age years		
20-<30	21	17.4
>30-<40	98	81.0
40-41	2	1.7
Range	21-41	
Mean±SD	32.54±5.28	
▪Sex		

Male	24	19.8
Female	97	80.2
▪**Experience years**		
<1	3	2.5
1-< 5	16	13.2
>5-<10	46	38.0
≥10	56	46.3
Mean±SD	10.88±4.10	
▪ **Educational level**		
Diploma in nursing	16	13.2
Technical Institute of nursing	101	83.5
Bachelor degree	4	3.3
▪ **Marital Status**		
Married	107	88.4
Single	8	6.6
Divorced	6	5.0

Table (2): shows the personal characteristics of the studied staff nurses in Saudi Arabia (n=121). It was observed that the majority (81.0%) were aged from >30-<40 years with a mean age of 32.54±5.28 years, and only (1.7%) were aged 40-41 years. Regarding sex, the vast majority (80.2%) were female compared to (19.8%) male. Concerning experience years, nearly half (46.3%) had ≥10 years of experience, followed by (38.0%) with >5-<10 years, and only (2.5%) with <1 year, with a mean experience of 10.88±4.10 years. Regarding educational level, the majority (83.5%) had Technical Institute of nursing qualification, while only (3.3%) had Bachelor degree. As for marital status, the majority (88.4%) were married, (6.6%) were single, and (5.0%) were divorced.

Figure (3): shows the total Work Engagement score and level among the studied staff nurses in Saudi Arabia before and after training program (n=121). Regarding total Work Engagement level, more than half (60.3%) had low level before training, which dramatically improved to (72.7%) having high level immediately after training, then declined to (58.7%) with high level after 3 months follow up, while moderate level decreased from (24.0%) before training to (7.4%) after 3 months. The total Work Engagement scores (17-102) showed significant improvement from a mean of 42.84±21.85 before training to 78.11±20.55 immediately after training, then decreased to 60.59±30.19 after 3 months follow up. These differences were statistically significant (x^2=103.444, P=0.0001).

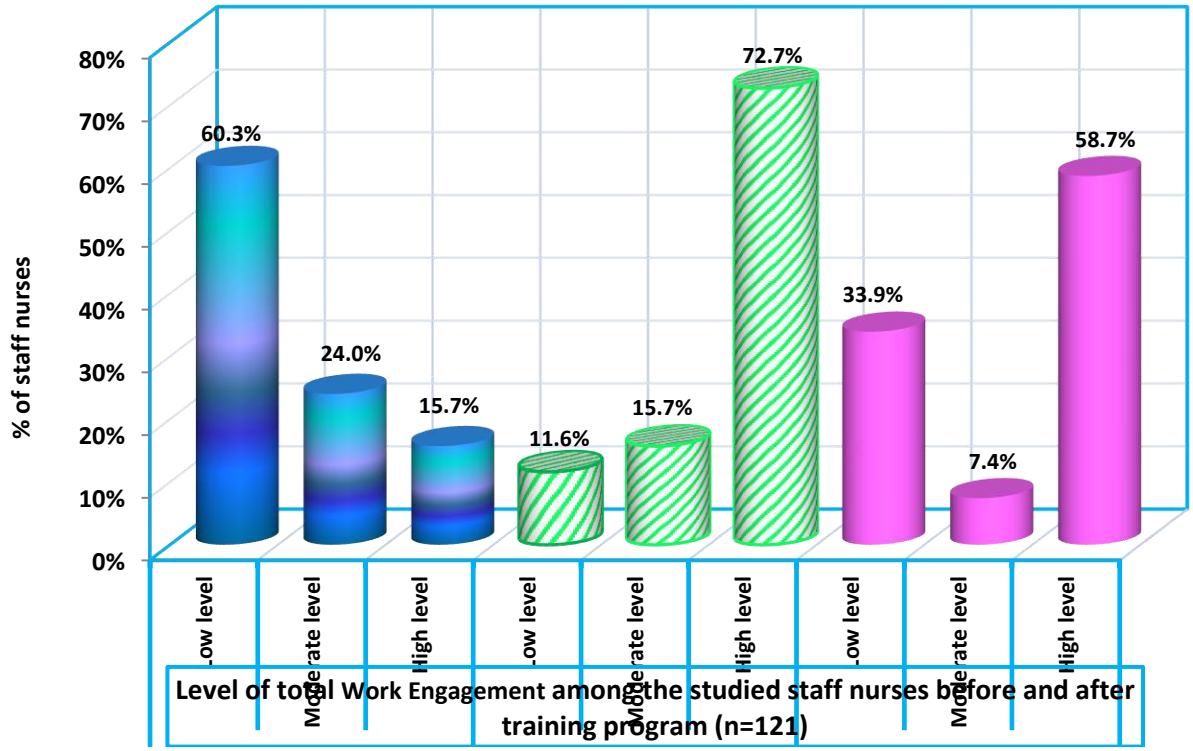


Figure (3): Level of total Work Engagement level among the studied staff nurses in Saudi Arabia before and after training program.

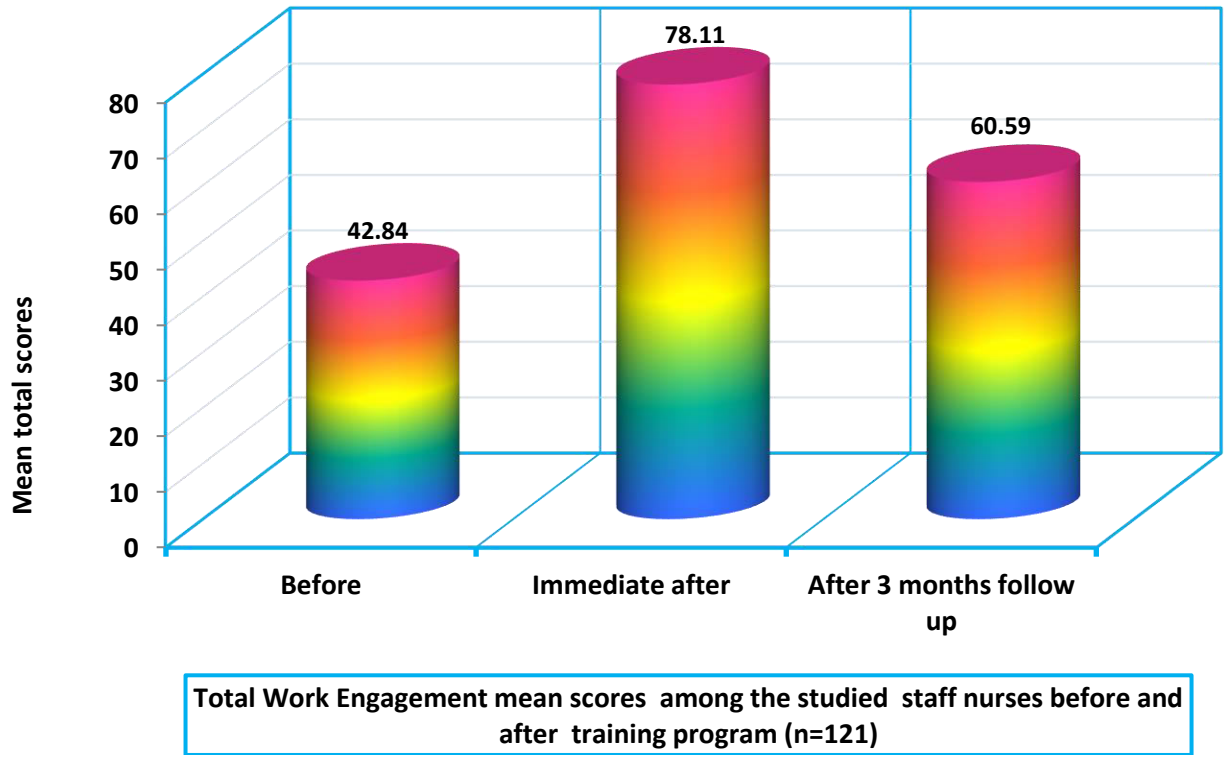


Figure (4): Total Work Engagement mean scores among the studied staff nurses in Saudi Arabia before and after training program.

Figure (4): illustrates the total Work Engagement mean scores among the studied staff nurses in Saudi Arabia before and after training program. The figure shows the progression of total engagement scores across the three assessment points: before training (42.84), immediately after training (78.11), and after 3 months follow up (60.59), demonstrating substantial improvement with some score decline over time while remaining significantly above baseline.

Discussion

Nursing requires tremendous physical, emotional and cognitive dedication to safe and high quality patient care. Safe, supportive, respectful and suitable work environments enable nurses to perform well, remain motivated and feel appreciated in their companies. Nurse engagement is important for patient outcomes, professional happiness and sustainability of the healthcare system. However, working conditions are a key determinant for nurses' participation (Zhang, et al., 2025).

Supportive leadership, effective communication and collaborative cooperation create healthy work environments and nurse engagement. Management that opens communication, involves nurses in decision making, and recognizes their achievements empowers nurses and develops a greater emotional connection to work. Respectful and collaborative work environments reduce interpersonal conflict and job stress which in turn increases nurses' commitment, enthusiasm and willingness to work harder in patient care (Hariyasasti, & Purwanto, 2025).

Adequate staffing, appropriate workloads and access to resources in a healthy work environment affect nurses' physical and emotional well-being and engagement. Safe staffing and fair work means avoiding fatigue and burnout, keeping nurses engaged, energetic and motivated. Work engagement and quality of nursing care are driven by sense of belonging and purpose, organisational support, professional development and nurse well-being (Moisoglou, Katsiroumpa, Katsapi, Konstantakopoulou, & Galanis, 2025).

The study was carried out to assess the impact of a healthy work environment training curriculum on nurses' engagement at King Fahad Specialist Hospital, Buraydah in Saudi Arabia.Knowledge of healthy work environment among Saudi head nurses pre- and post-training; mean scores.The current results demonstrate the average Healthy Work Environment Knowledge scores of Saudi head nurses across the three training evaluation periods. Knowledge scores demonstrate a progressive pattern at baseline, immediate post-training and three-

month follow-up. The training programme was successful, but there was moderate decline in retention of material on follow up.

Several aspects linked to the knowledge retention after educational activity. The rapid post-training increase in knowledge scores can be explained by the recency effect: information is most accessible when it is recently gained and reinforced by training. The 3 month decline can be explained by the normal forgetting curve when there is no reinforcement for learnt knowledge. The decline in performance can be explained by lack of practice, refresher courses or the constant introduction of new knowledge into daily work processes.

The current result of the increase in head nurses' HWE knowledge following training program and slight decrease at follow-up was similar to the findings of Manning & Jones (2021) who investigated enhancing healthy work environments through specialty nursing professional development and found that professional development initiatives increase nurses' competencies and workplace outcomes. Structured educational programs can enhance professional awareness and knowledge of workplace health as evidenced by the significant improvement immediately after training in the current study. The present findings showed an increase in knowledge about healthy work environments after the training with higher scores than at baseline at the follow-up. In addition, Mabona et al. (2022) who reviewed best practices of healthy work environments for nurses, stressed the importance of ongoing learning and the planning of educational and organisational strategies.

Current results show that HWE knowledge scores increase with the training programme. Eva et al. A 2024 systematic review of intervention programmes to improve the nursing work environment, concluded that intervention-based programmes generally improve indicators of the nursing work environment. (2022) systematically reviewed the intention to stay among nurses in acute healthcare settings and concluded that supportive and healthy work conditions had a considerable effect on nurses' retention and intention to stay. This lends support to the present findings that educating head nurses in HWE may increase leadership abilities that build supportive workplaces, decreasing staff turnover and stabilising personnel, although knowledge retention needs constant reinforcement.

Aust et al. A systematic review of evaluations. (2023) indicated that interventions at the organisational level frequently improve psychosocial work environment, health and retention, but the long-term sustainability of these interventions is variable. This is consistent with the present findings in terms of the knowledge evaluations remaining improved at three months, although moderately reduced .

This reveals the need for ongoing reinforcement and frequent refresher sessions to sustain training outcomes.

In a scoping review by Persson et al. (2022) found that the use of robots and the impact of robots on the work environment of caretakers such as the adoption of technology and organizational change influence the work environment conditions. The results underline the necessity of continuous adaptation and updated information for a positive work environment and could explain the small drop in knowledge retention in the present study at the follow-up phase. Supporting the present results of increased HWE knowledge after training, Bruyneel et al. (2023) reported that negative work conditions are a major contributor to burnout and to the intentions to leave the profession among Belgian ICU nurses during the pandemic. This complements the present findings in that it emphasises the relevance of work environment awareness and leadership expertise, since head nurses' HWE knowledge with training may enhance staff wellbeing and retention when maintained and refreshed.

Zhenjing et al. (2022) examined the role of working environment in employee performance using a multi-mediation model. The study revealed that multiple mediating mechanisms exist. The authors conclude that strengthening head nurses' knowledge of HWE may enhance management practices, create a healthier atmosphere and increase staff performance, but the minor reduction at follow-up suggests that further reinforcement is needed to maintain the results. The baseline survey conducted before to the training showed that most participants had inadequate knowledge of a Healthy Work Environment. Most participants reached a high level soon after the training intervention. Most still had good skill although a drop was seen at three months. The percentage of respondents with moderate knowledge increased from immediate post-test to three months post-test. All variations between assessment periods were significant at the .05 level.

This may be due to the lack of follow-up professional development and knowledge reinforcement in single-intervention training programmes. The training approach implies that during the intense learning phase, knowledge acquisition has been successful but in the absence of booster sessions or spaced repetition, memory consolidation is compromised in the long run. The loss may also be attributed to the fact that head nurses cannot use new information in their work due to organisational restrictions, resource limits or aversion to change.

In agreement with the present results, Bruyneel et al. Belgian ICU nurses in adverse work environments reported higher burnout and intentions to quit the profession (2023).

This stresses the need to educate nurses on the health work environment to enhance coping strategies and career prospects. Eva et al. (2024) reviewed evidence on intervention programs to improve the nursing work environment. They concluded that overall, intervention programmes increase nurse work environment outcomes, which is in line with current findings. This supports the current finding suggesting a considerable improvement in Healthy Work Environment knowledge after training.

Work involvement of Saudi staff nurses before-and after training.

The present study outcomes revealed the Saudi Arabian staff nurses' Work Engagement dimension scores during training. Mean Vigour ratings significantly increased from baseline pre-training to immediate post-training and decreased over the three-month follow-up. Mean scores for dedication increased from pre-training baseline to immediate post-training evaluation and decreased over three months. Mean scores on the Absorption dimension increased from baseline to immediate post-training evaluation and declined over a three-month period. All differences were significant ($P < .05$).

Perhaps the training program's transient motivational boost and heightened enthusiasm could have quickly benefited nurses' psychological states and work-related attitudes in all engagement measures. Skills development and educational interventions frequently provide a novelty effect and a renewed professional impetus that improves vigour, devotion and absorption ratings in the immediate aftermath of training. The reduction in all three variables after the three-month follow-up suggests that nurses' initial enthusiasm diminishes when they return to their normal work settings without demonstrable improvements in the workplace.

In line with the present findings, Tang et al. (2022) observed that Chinese clinical nurses with more organisational commitment showed increased work engagement. Training interventions often raise nurses' professional value and their attachment to their organisation which may increase engagement and enthusiasm, dedication and absorption shortly after training.

Besides the present results, Wang et al. (2021) also observed that work engagement among Chinese dental nurses was affected by job satisfaction, a supportive atmosphere and organisational factors. This aligns with the contemporary trend of increased engagement post training and suggests that training could have improved nurses' perceived competence and optimism at work.

Alharbi & Alrwaitey (2023) studied work engagement of registered nurses in Saudi Arabian paediatric wards and discovered that working environment and professional support have a major impact on nurse engagement. This is consistent with the present finding that engagement qualities enhanced immediately post-training since educational interventions improve motivation and confidence. Their findings also suggest that continued engagement requires ongoing organisational support and this may explain the marked drop off at three months if reinforcement strategies are not put in place.Pericak et al. (2020) also found that evidence-based interventions for workload, leadership support, recognition and professional development promote work engagement among registered nurses, supporting the earlier improvement in energy, commitment and absorption after training as professional growth drives involvement. Their findings further suggest that engagement gains may not be sustainable without evidence-based interventions, consistent with the decline at follow-up. Alkorashy and Alanazi (2023) revealed that the job demands and resources, leadership and work circumstances had a strong association with the work engagement of Saudi hospital nurses. Training can raise job resources (knowledge, confidence, communication and coping abilities) which increases engagement immediately post training. Their findings are consistent with the follow-up reduction, suggesting that job pressures and resource limitation may be related to reduced involvement.

The results of this study were consistent with the results of Baghdadi et al. (2021) which mentioned that nurses who actively participate in the development of their profession are more engaged.

Conclusions

The study concluded that the training programme significantly improved Healthy Work Environment Knowledge among head nurses and Work Engagement among staff nurses in Saudi Arabia, with immediate post-training assessments showing significant progress from baseline levels. However, a moderate reduction in knowledge retention and work engagement was noted during the three-month follow-up period, while most individuals still had greater levels than baseline. Demographic and professional variables like age, nursing experience and prior exposure to training were also found to be significant determinants of knowledge acquisition and patterns of involvement over the training timeframe.

Recommendations

Recommendations For Staff Nurses:

• To actively participate in all training programmes and workshops for healthy work environment and professional growth to increase knowledge and engagement levels

• Regularly self-assess job engagement aspects such as vigour, devotion, and absorption to find areas for personal improvement For Head Nurse

• Conduct periodic knowledge assessment sessions with staff nurses to determine retention of healthy work environment ideas beyond the initial training period

• Develop and deliver monthly refresher training modules (focused on important concepts) to prevent knowledge decline detected at 3-month follow-up

For Nurse Managers:

Dedicate specific budget and resources for continuing training programmes with planned follow-up sessions every three months for knowledge retention

• Develop robust assessment tools for monitoring the immediate and longer-term results of training interventions on knowledge and work engagement

For Future Study:

• Identify specific elements contributing to knowledge loss between immediate post-training and 3-month follow-up tests to help with retention techniques

• Perform longitudinal studies lasting more than three months to establish best times for refresher training and long-term knowledge retention

• Analyze the effects of demographic characteristics such as age, experience and education level on learning styles and preferred training delivery methods

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