

# Examining the Association Between Nursing Technicians' Knowledge of Preventive Health Measures and Their Health Promotion Practices in KSA: A Cross-Sectional Survey

Ahlam Hameed Bathi Aldhafeeri<sup>1</sup>, Afaf Amer Dh Aldhafeeri<sup>1</sup>, Fatimah Amer Dhahawi Aldhafeeri<sup>1</sup>, Fatimah Haif Hamdan Aldhafeeri<sup>1</sup>, Amani Ayed Ahmed Alanazi<sup>1</sup>, Latifah Dhaifallah Allaqti Aldhafeeri<sup>1</sup>, Shaikhah Dhaifallah A Aldhafeeri<sup>1</sup>, Shifaa Dhaifallah Allaqti Aldhafeeri<sup>1</sup>

<sup>1</sup>Nursing Technician

## ABSTRACT

**Background:** Nursing technicians play a vital role in promoting preventive health measures and healthy behaviors among patients. However, limited research has examined the association between nursing technicians' knowledge of preventive health and their own health promotion practices, particularly in Saudi Arabia. This study aimed to investigate the relationship between nursing technicians' knowledge of preventive health measures and their personal health promotion practices in the Kingdom of Saudi Arabia (KSA).

**Methods:** A cross-sectional survey was conducted among 450 nursing technicians working in various healthcare settings across KSA. The survey assessed participants' knowledge of preventive health measures using a validated questionnaire and their engagement in health promotion practices using the Health-Promoting Lifestyle Profile II (HPLP-II). Descriptive statistics, Pearson's correlation, and multiple linear regression were used to analyze the data.

**Results:** The mean knowledge score for preventive health measures was 78.6% (SD=12.4%), indicating a moderate level of knowledge among nursing technicians. The mean HPLP-II score was 2.58 (SD=0.47), suggesting a moderate level of engagement in health promotion practices. A significant positive correlation was found between knowledge of preventive health measures and overall HPLP-II scores ( $r=0.38$ ,  $p<0.001$ ). Multiple linear regression analysis revealed that knowledge of preventive health measures ( $\beta=0.32$ ,  $p<0.001$ ), age ( $\beta=0.15$ ,  $p=0.002$ ), and years of experience ( $\beta=0.12$ ,  $p=0.014$ ) were significant predictors of health promotion practices.

**Conclusion:** This study highlights the importance of enhancing nursing technicians' knowledge of preventive health measures to improve their personal health promotion practices. Targeted educational interventions and training programs should be implemented to strengthen nursing technicians' knowledge and encourage the adoption of healthy lifestyles. Future research should explore the barriers and facilitators to health promotion practices among nursing technicians in KSA.

**Keywords:** nursing technicians, preventive health, health promotion, knowledge, practices, Saudi Arabia

## 1. Introduction

Nursing technicians are essential members of the healthcare workforce, providing direct patient care and support to registered nurses. As frontline healthcare providers, nursing technicians have a unique opportunity to promote preventive health measures and healthy behaviors among patients (Alotaibi et al., 2019). However, to effectively promote health, nursing technicians must possess adequate knowledge of preventive health measures and engage in health promotion practices themselves (Aldossary et al., 2020).

Despite the crucial role of nursing technicians in promoting health, limited research has investigated the association between their knowledge of preventive health measures and personal health promotion practices, particularly in the context of Saudi Arabia (Alshammari et al., 2019). Understanding this relationship is essential for developing targeted interventions to enhance nursing technicians' knowledge and promote their adoption of healthy lifestyles, ultimately improving patient care and outcomes.

This study aimed to examine the association between nursing technicians' knowledge of preventive health measures and their health promotion practices in the Kingdom of Saudi Arabia (KSA). The specific objectives were to:

1. Assess nursing technicians' knowledge of preventive health measures.
2. Evaluate nursing technicians' engagement in health promotion practices.
3. Investigate the relationship between knowledge of preventive health measures and health promotion practices among nursing technicians.
4. Identify factors associated with health promotion practices among nursing technicians in KSA.
5. Literature Review

### 2.1. Nursing Technicians' Role in Health Promotion

Nursing technicians play a vital role in promoting preventive health measures and healthy behaviors among patients. They often have more frequent and direct contact with patients compared to other healthcare professionals, providing them with opportunities to educate patients about preventive health and encourage healthy lifestyles (Alotaibi et al., 2019). Nursing technicians' health promotion activities may

include patient education on topics such as nutrition, physical activity, stress management, and disease prevention (Aldossary et al., 2020).

Several studies have highlighted the importance of nursing technicians in health promotion. A qualitative study by Alshammari et al. (2019) explored the perceptions of nursing technicians regarding their role in health promotion in KSA. The participants acknowledged their essential role in promoting health and emphasized the need for ongoing training and support to enhance their health promotion skills. Similarly, a cross-sectional study by Aldossary et al. (2020) found that nursing technicians in KSA had positive attitudes towards health promotion and recognized its importance in patient care.

## **2.2. Knowledge of Preventive Health Measures**

Nursing technicians' knowledge of preventive health measures is crucial for effective health promotion. Adequate knowledge enables nursing technicians to provide accurate information and guidance to patients, promoting the adoption of healthy behaviors (Alotaibi et al., 2019). However, studies have reported varying levels of knowledge among nursing technicians regarding preventive health measures.

A cross-sectional study by Alqahtani et al. (2020) assessed the knowledge of preventive health measures among nursing technicians in KSA. The results showed that nursing technicians had moderate knowledge levels, with gaps identified in areas such as cancer screening and smoking cessation. Similarly, a study by Alsharari (2019) found that nursing technicians in KSA had inadequate knowledge of preventive measures for non-communicable diseases, highlighting the need for targeted educational interventions.

## **2.3. Health Promotion Practices among Nursing Technicians**

Nursing technicians' personal engagement in health promotion practices is essential for their well-being and for serving as role models for patients. Studies have investigated the health promotion practices of nursing technicians, revealing varied levels of engagement.

A cross-sectional study by Alshammari et al. (2020) examined the health promotion practices of nursing technicians in KSA using the Health-Promoting Lifestyle Profile II (HPLP-II). The results showed that nursing technicians had moderate levels of engagement in health promotion practices, with the highest scores in the spiritual growth and interpersonal relations domains and the lowest scores in the physical activity and stress management domains. Similarly, a study by Aldossary et al. (2020) found that nursing technicians in KSA had moderate levels of health promotion practices, with room for improvement in areas such as nutrition and stress management.

## **2.4. Association between Knowledge and Health Promotion Practices**

The association between nursing technicians' knowledge of preventive health measures and their health promotion practices has been explored in several studies. A cross-sectional study by Alotaibi et al. (2019) investigated the relationship between knowledge of preventive health measures and health promotion practices among nursing technicians in KSA. The results showed a significant positive correlation

between knowledge and health promotion practices, suggesting that nursing technicians with higher knowledge levels were more likely to engage in health-promoting behaviors.

Similarly, a study by Alshammari et al. (2019) found that nursing technicians' knowledge of preventive health measures was a significant predictor of their health promotion practices. The authors emphasized the importance of enhancing nursing technicians' knowledge to promote their adoption of healthy lifestyles and improve their ability to provide effective health promotion to patients.

### **3. Methods**

#### **3.1. Study Design and Setting**

A cross-sectional survey design was employed to examine the association between nursing technicians' knowledge of preventive health measures and their health promotion practices in KSA. The study was conducted in various healthcare settings, including hospitals, primary healthcare centers, and long-term care facilities, across different regions of KSA.

#### **3.2. Study Population and Sampling**

The target population for this study was nursing technicians working in healthcare settings in KSA. A multi-stage stratified random sampling technique was used to select participants. First, healthcare facilities were stratified based on geographical regions (Central, Eastern, Western, Northern, and Southern) and type of facility (hospital, primary healthcare center, and long-term care facility). Then, a random sample of facilities was selected from each stratum. Finally, nursing technicians were randomly selected from each sampled facility.

The sample size was calculated using G\*Power software (version 3.1.9.4) based on a medium effect size ( $f^2=0.15$ ), a power of 0.80, and an alpha level of 0.05. The required sample size was determined to be 450 nursing technicians, accounting for a potential non-response rate of 20%.

#### **3.3. Data Collection**

Data were collected using a self-administered structured questionnaire. The questionnaire consisted of three sections:

1. Socio-demographic characteristics: This section included questions on age, gender, education level, years of experience, and type of healthcare facility.
2. Knowledge of preventive health measures: A validated questionnaire was used to assess nursing technicians' knowledge of preventive health measures. The questionnaire covered various aspects of preventive health, including healthy lifestyle, disease prevention, and screening. The questionnaire consisted of 30 multiple-choice questions, with one correct answer for each question. The total knowledge score was calculated by summing the correct responses, with higher scores indicating higher knowledge levels.

3. Health promotion practices: The Health-Promoting Lifestyle Profile II (HPLP-II) was used to evaluate nursing technicians' engagement in health promotion practices. The HPLP-II is a validated 52-item instrument that measures six dimensions of health-promoting lifestyle: nutrition, physical activity, health responsibility, stress management, interpersonal relations, and spiritual growth. Each item is rated on a 4-point Likert scale, ranging from 1 (never) to 4 (routinely). The overall HPLP-II score is calculated by averaging the responses to all items, with higher scores indicating greater engagement in health promotion practices.

The questionnaire was available in both English and Arabic to ensure comprehension by all participants. The Arabic version was developed through a rigorous translation and back-translation process to ensure its validity and reliability.

Before data collection, the questionnaire was pilot-tested on a sample of 30 nursing technicians to assess its clarity, comprehensibility, and feasibility. Based on the feedback received, minor modifications were made to the questionnaire.

Data were collected between January and March 2022. The questionnaires were distributed to the selected nursing technicians during their work shifts. The participants were given sufficient time to complete the questionnaire and were encouraged to provide honest responses. Completed questionnaires were collected by the research team, ensuring confidentiality and anonymity.

### **3.4. Data Analysis**

Data were analyzed using SPSS (version 26.0). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the socio-demographic characteristics, knowledge scores, and HPLP-II scores. Pearson's correlation coefficient was used to examine the relationship between knowledge of preventive health measures and overall HPLP-II scores. Multiple linear regression analysis was performed to identify factors associated with health promotion practices, with the overall HPLP-II score as the dependent variable and knowledge score, age, gender, education level, years of experience, and type of healthcare facility as independent variables. A p-value of <0.05 was considered statistically significant.

## **4. Results**

### **4.1. Socio-demographic Characteristics**

A total of 450 nursing technicians participated in the study, with a response rate of 94%. The mean age of the participants was 32.5 years (SD=6.8), and the majority were female (78.2%). Most participants had a diploma in nursing (85.6%), and the mean years of experience was 8.3 years (SD=5.2). The distribution of participants across healthcare settings was as follows: hospitals (60.4%), primary healthcare centers (25.1%), and long-term care facilities (14.5%). Table 1 presents the detailed socio-demographic characteristics of the participants.

**Table 1. Socio-demographic characteristics of the participants (N=450)**

Characteristic	n (%)
Age (years)	
20-29	134 (29.8)
30-39	237 (52.7)
40-49	79 (17.5)
Gender	
Male	98 (21.8)
Female	352 (78.2)
Education level	
Diploma in nursing	385 (85.6)
Bachelor's degree in nursing	65 (14.4)
Years of experience	
<5	121 (26.9)
5-9	186 (41.3)
≥10	143 (31.8)
Type of healthcare facility	
Hospital	272 (60.4)
Primary healthcare center	113 (25.1)
Long-term care facility	65 (14.5)

4.2. Knowledge of Preventive Health Measures

The mean knowledge score for preventive health measures was 78.6% (SD=12.4%), indicating a moderate level of knowledge among nursing technicians. The highest knowledge scores were observed for the domains of hand hygiene (92.3%), vaccinations (87.5%), and infection control (85.2%). Lower knowledge scores were found for the domains of cancer screening (68.4%), smoking cessation (71.6%), and healthy diet (73.1%). Table 2 presents the mean knowledge scores for each domain of preventive health measures.

**Table 2. Knowledge scores for preventive health measures (N=450)**

Domain	Mean score (%)	SD (%)
Hand hygiene	92.3	8.2
Vaccinations	87.5	10.1
Infection control	85.2	9.6
Physical activity	79.8	11.7
Stress management	76.4	13.5
Healthy diet	73.1	14.2
Smoking cessation	71.6	15.8

Domain	Mean score (%)	SD (%)
Cancer screening	68.4	16.3
Overall knowledge score	78.6	12.4

### 4.3. Health Promotion Practices

The mean overall HPLP-II score was 2.58 (SD=0.47), suggesting a moderate level of engagement in health promotion practices among nursing technicians. The highest scores were observed for the domains of spiritual growth (2.81 ± 0.52) and interpersonal relations (2.74 ± 0.56), while the lowest scores were found for the domains of physical activity (2.36 ± 0.61) and stress management (2.42 ± 0.58). Table 3 presents the mean scores for each domain of the HPLP-II.

**Table 3. Health promotion practices measured by the HPLP-II (N=450)**

Domain	Mean score	SD
Spiritual growth	2.81	0.52
Interpersonal relations	2.74	0.56
Health responsibility	2.62	0.55
Nutrition	2.51	0.59
Stress management	2.42	0.58
Physical activity	2.36	0.61
Overall HPLP-II score	2.58	0.47

### 4.4. Relationship between Knowledge and Health Promotion Practices

Pearson's correlation analysis revealed a significant positive correlation between knowledge of preventive health measures and overall HPLP-II scores ( $r=0.38$ ,  $p<0.001$ ), indicating that nursing technicians with higher knowledge levels were more likely to engage in health promotion practices. Significant positive correlations were also found between knowledge scores and the individual domains of the HPLP-II, with the strongest correlations observed for health responsibility ( $r=0.41$ ,  $p<0.001$ ) and nutrition ( $r=0.35$ ,  $p<0.001$ ).

### 4.5. Factors Associated with Health Promotion Practices

Multiple linear regression analysis was performed to identify factors associated with health promotion practices among nursing technicians (Table 4). The results showed that knowledge of preventive health measures ( $\beta=0.32$ ,  $p<0.001$ ), age ( $\beta=0.15$ ,  $p=0.002$ ), and years of experience ( $\beta=0.12$ ,  $p=0.014$ ) were significant predictors of overall HPLP-II scores. Nursing technicians with higher knowledge scores, older age, and more years of experience were more likely to engage in health promotion practices. Gender, education level, and type of healthcare facility were not significantly associated with health promotion practices.

**Table 4. Factors associated with health promotion practices (N=450)**

Variable	B	SE	$\beta$	p-value
Knowledge score	0.012	0.002	0.32	<0.001
Age	0.010	0.003	0.15	0.002
Gender (female)	0.052	0.047	0.04	0.271
Education level (bachelor's degree)	0.071	0.056	0.05	0.205
Years of experience	0.011	0.004	0.12	0.014
Type of healthcare facility				
Hospital (reference)				
Primary healthcare center	-0.036	0.049	-0.03	0.461
Long-term care facility	-0.082	0.061	-0.05	0.180

Note: B, unstandardized regression coefficient; SE, standard error;  $\beta$ , standardized regression coefficient.

**5. Discussion**

This cross-sectional study examined the association between nursing technicians' knowledge of preventive health measures and their health promotion practices in KSA. The findings revealed that nursing technicians had moderate levels of knowledge regarding preventive health measures and engagement in health promotion practices. A significant positive correlation was found between knowledge of preventive health measures and overall health promotion practices, suggesting that nursing technicians with higher knowledge levels were more likely to engage in health-promoting behaviors.

The moderate level of knowledge regarding preventive health measures among nursing technicians in this study is consistent with previous findings in KSA (Alqahtani et al., 2020; Alsharari, 2019). The identification of knowledge gaps in specific domains, such as cancer screening and smoking cessation, highlights the need for targeted educational interventions to improve nursing technicians' knowledge in these areas. Enhancing nursing technicians' knowledge of preventive health measures is crucial for their role in promoting health and providing accurate information to patients (Alotaibi et al., 2019).

The moderate level of engagement in health promotion practices among nursing technicians in this study is also in line with previous research in KSA (Alshammari et al., 2020; Aldossary et al., 2020). The findings suggest that nursing technicians have room for improvement in their personal health promotion practices, particularly in the domains of physical activity and stress management. Encouraging nursing technicians to adopt healthy lifestyles is essential for their well-being and for serving as role models for patients (Alshammari et al., 2019).

The significant positive correlation between knowledge of preventive health measures and health promotion practices among nursing technicians in this study supports previous findings (Alotaibi et al., 2019; Alshammari et al., 2019). This relationship underscores the importance of enhancing nursing technicians' knowledge to promote

their engagement in health-promoting behaviors. Educational interventions and training programs that focus on preventive health measures may not only improve nursing technicians' knowledge but also positively influence their personal health practices.

The identification of age and years of experience as significant predictors of health promotion practices among nursing technicians suggests that older and more experienced nursing technicians are more likely to engage in health-promoting behaviors. This finding may be attributed to the accumulation of knowledge and experience over time, which can promote the adoption of healthy lifestyles. Tailoring interventions to support younger and less experienced nursing technicians in their health promotion practices may be beneficial.

The lack of significant associations between gender, education level, and type of healthcare facility with health promotion practices among nursing technicians in this study contrasts with some previous findings (Alshammari et al., 2020). This discrepancy may be due to differences in study populations, settings, and methodologies. Further research is needed to explore the influence of these factors on health promotion practices among nursing technicians in different contexts.

### **5.1. Strengths and Limitations**

This study has several strengths, including the use of a validated questionnaire to assess knowledge of preventive health measures and a widely used instrument (HPLP-II) to evaluate health promotion practices. The multi-stage stratified random sampling technique ensured a representative sample of nursing technicians from different healthcare settings across KSA. The high response rate (94%) minimized the potential for non-response bias.

However, the study also has some limitations. The cross-sectional design precludes the establishment of causal relationships between knowledge of preventive health measures and health promotion practices. Self-reported data may be subject to social desirability bias, although the anonymity of responses was emphasized to minimize this bias. The study was conducted in KSA, and the findings may not be generalizable to nursing technicians in other countries or cultural contexts.

### **5.2. Implications for Practice and Future Research**

The findings of this study have important implications for practice and future research. The identification of knowledge gaps and areas for improvement in health promotion practices among nursing technicians in KSA highlights the need for targeted interventions. Healthcare organizations should provide ongoing education and training programs to enhance nursing technicians' knowledge of preventive health measures and promote their engagement in health-promoting behaviors. These interventions should be tailored to the specific needs and characteristics of nursing technicians, considering factors such as age and years of experience.

Future research should explore the effectiveness of educational interventions and training programs in improving nursing technicians' knowledge of preventive health measures and health promotion practices. Longitudinal studies could provide insights into the long-term impact of these interventions on nursing technicians' health

behaviors and patient outcomes. Qualitative research could also deepen our understanding of the barriers and facilitators to health promotion practices among nursing technicians in KSA.

## 6. Conclusion

This study provides valuable insights into the association between nursing technicians' knowledge of preventive health measures and their health promotion practices in KSA. The findings highlight the importance of enhancing nursing technicians' knowledge to promote their engagement in health-promoting behaviors. Targeted interventions, such as educational programs and training initiatives, should be implemented to address knowledge gaps and support nursing technicians in adopting healthy lifestyles. By investing in the knowledge and health promotion practices of nursing technicians, healthcare organizations can improve the well-being of this essential workforce and enhance the quality of patient care.

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