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***Original research article***

# KAP ANALYSIS OF NURSES REGARDING PREVENTION OF OSTEOPOROSIS AND ITS ASSOCIATION WITH NUTRITIONAL BEHAVIORS

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**Abstract:** *Osteoporosis is a significant public health concern, affecting millions globally. Nurses play a vital role in educating and guiding patients about preventive measures. However, their knowledge, attitudes, and practices (KAP) regarding osteoporosis prevention, along with their own nutritional behaviours, are crucial factors that can influence patient care and health outcomes.* ***Objective:*** *To determine the knowledge, attitudes, and practice of nurses regarding osteoporosis prevention and its association with nutritional behaviours.* ***Methods:*** *A cross-sectional study was conducted in the Nursing Department of Nishtar Hospital, Multan from September 2023 to August 2024. A total of 100 nurses with at least a bachelor's degree and a minimum of one year of work experience were included in the study. The data was collected through a questionnaire divided into five sections to collect demographic information, levels of knowledge, attitudes and practices, and nutritional habits of nurses.* ***Results:*** *The mean knowledge score was 19.24 ± 4.10 with 55% of nurses possessing good knowledge. The mean attitude score was 71.68 ± 7.05 with 80% of nurses having positive attitudes. The mean attitude score was 47.32 ± 7.44 with 58% of nurses having good practices. 58% of nurses had good nutritional behaviours with a mean score of 111.08 ± 14.73. A strong direct association was observed between nutritional behaviors and KAP scores (p=0.001).* ***Conclusion:*** *Good knowledge, attitudes, practices, and nutritional behaviours were noted in nurses regarding osteoporosis prevention. The KAP scores had a direct and strong association with nutritional behaviors promoting lifestyle changes.*

**Keywords:** Attitudes, Knowledge, Nutrition, Practice.

## Introduction

Osteoporosis is a skeletal disorder that involves loss of bone structure and density, increasing the risk of fractures. Over 200 million individuals, every third woman and every fifth man older than 50 years have osteoporosis.1 It greatly affects the quality of life of people as it increases the risk of physical disability, longer hospital stays, and even death2. There is currently no cure for osteoporosis, hence it is recommended to optimize and maintain bone density during childhood and adolescence to prevent bone loss in elderly years.3

Various research studies have focused on prevention and treatment intervention for osteoporosis.4, 5 However, health care professionals like nurses play an important role in guiding patients about risk factors of the condition and lifestyle changes needed like adequate BMI, exercise, use of calcium-rich products, and refraining from tobacco and alcohol. Nutritional behaviors are significantly associated with osteoporosis as a healthy low-calorie diet that is rich in proteins, minerals, and vitamins can preserve bone structure and reduce the risk of fractures.6 Since there is a lack of awareness among individuals regarding this, prevention programs often led by healthcare professionals are an essential need.

Several KAP studies have been conducted in Pakistan in nurses but none of them addressed osteoporosis. Since the incidence of this condition is increasing rapidly, nurses need to be aware and trained to prevent it. This study was conducted to determine the knowledge, attitudes, and practices of nurses regarding osteoporosis prevention and its association with nutritional behaviors.

## Methodology

A cross-sectional study was conducted in the Nursing Department of Nishtar Hospital, Multan from September 2023 to August 2024. A total of 100 nurses with at least a bachelor's degree and a minimum of one year of work experience were included in the study. Students on internship and nurses on rotation were excluded. All participants provided their informed consent to become a part of the study. The ethical board of the hospital approved the study.

The data was collected through a questionnaire divided into five sections. The first section included demographic questions regarding age, sex, marital status, qualification, job title, department, and corticosteroid use. Knowledge was analyzed in the second section which included 30 questions that could be answered by selecting true or false. 1 point was added to the score in case of correct answer and no point was given in case of incorrect answer. The score range was 0-30 with a score less than 10 showing poor knowledge, a 10-20 score showing moderate knowledge, and a 20-30 score showing good knowledge. Attitudes were evaluated in the third section which included 18 questions that could be responded to on a Likert scale from 1 to 5 with 1 being strongly disagree and 5 being strongly disagree for positive statements and reverse scoring for negative statements. The score range was 18-90 where a score less

than 42 showed a poor attitude, a 42-66 score showed a moderate attitude and a score more than 66 showed a positive attitude.

The fourth section of the questionnaire included 23 questions that evaluated the practices of nurses regarding osteoporosis prevention. Correct statements could be answered on a scale of 1 to 3 where 1 was always and 3 was never, while incorrect statements could be ranked in reverse. The score range was 23-69 where a score less than 23 showed poor practice, a 23-46 score showed satisfactory practice and a 46-69 score showed good practice.

The last section of the questionnaire assessed the nutritional behaviours of nurses regarding osteoporosis prevention through 29 questions. Statements could be answered on a Likert scale from 1 to 5 with 1 being strongly disagree and 5 being strongly agree for positive statements and reverse ranking for negative statements. The score range was 29-145 where a score less than 68 indicated poor nutritional behaviors, a 68-107 score indicated satisfactory behaviors and a score more than 107 showed good behaviors. The questionnaire was tested for validity and reliability with a Cronbach's alpha of 0.80.

All data was analysed by SPSS version 24. Descriptive analysis was done to present qualitative and quantitative variables by performing t-tests. Variables were compared by Pearson's correlation analysis, ANOVA, and Tukey's test, where applicable. Data normalcy was tested by the Kolmogorov-Smirnov test. A p-value less than 0.05 was taken as significant.

**Results**

A total of 100 responses were included in the analysis which showed that 74% were female, 46% were in the 31-40 years age group, half of them had < 10 years of experience, 77% were married and 85% had a bachelor. The job title (p=0.02) and work experience (p=0.03) were significantly associated with knowledge scores. Permanent job positions and more work experience had higher knowledge scores. Job titles were also significantly associated with positive attitudes with head nurses having more favorable attitudes than nurses (p=0.02). Practice scores significantly differed between genders as females had higher scores than men (p=0.001). Marital status (p=0.02), gender (p=0.03), and job titles (p=0.03) were significantly associated with good nutritional behaviors with married nurses and head nurses performing well. The KAP and nutritional behaviour scores concerning nurses' demographics are shown in Table I.

The mean knowledge score was 19.24 ± 4.10 with 55% of nurses possessing good knowledge. The mean attitude score was 71.68 ± 7.05 with 80% of nurses having positive attitudes. The mean attitude score was 47.32 ± 7.44 with 58% of nurses having good practices. 58% of nurses had good nutritional behaviors with a mean score of 111.08 ± 14.73. A strong direct association was observed between nutritional behaviors and KAP scores (p=0.001) (Table II).

Multi-variate regression analysis showed that nutritional behaviours were significantly associated with knowledge (p=0.003), attitude (p<0.001), and practice (p<0.001) regarding osteoporosis prevention, and demographics did not play any significant role in this regard (Table III).

**Table I: Nurses' Demographics and Their Association with KAP Scores and Nutritional Behaviors**

| Variables | N (%) | Knowledge | | Attitudes | | Practice | | Nutritional behaviour | |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean ± SD | P | Mean ± SD | P | Mean ± SD | P | Mean ± SD | P |
| Age | | | | | | | | | |
| 20-30 years | 20 (20%) | 19 ± 3.93 | 0.70 | 71.70 ± 5.64 | 0.81 | 46.83 ± 4.91 | 0.50 | 109.46 ± 12.83 | 0.71 |
| 31-40 years | 46 (46%) | 20.71 ± 3.98 | | 71.29 ± 6.09 | | 46.92 ± 5.52 | | 111.11 ± 15.47 | |
| 41-50 years | 34 (34%) | 20.08 ± 2.18 | | 72.18 ± 6.0 | | 48.10 ± 5.63 | | 112.18 ± 14.91 | |
| Gender | | | | | | | | | |
| Male | 26 (26%) | 18.58 ± 3.98 | 1.42 | 71.36 ± 5.16 | 0.40 | 46.74 ± 4.83 | 0.001 | 105.43 ± 13.09 | 0.03 |
| Female | 74 (74%) | 19.56 ± 3.71 | | 71.78 ± 6.27 | | 50.16 ± 5.42 | | 110.33 ± 14.04 | |
| Experience | | | | | | | | | |
| Less than 10 years | 50 (50%) | 20.38 ± 3.97 | 0.03 | 71.49 ± 5.56 | 0.47 | 46.72 ± 5.27 | 0.32 | 108.51 ± 13.97 | 0.063 |
| 10-20 years | 40 (40%) | 19.46 ± 3.27 | | 71.31 ± 6.73 | | 47.19 ± 4.36 | | 120.88 ± 11.85 | |
| More than 20 years | 11 (11%) | 20.47 ± 3.82 | | 72.84 ± 7.63 | | 48.55 ± 5.38 | | 113.67 ± 14.74 | |
| Qualification | | | | | | | | | |
| Bachelors' | 85 (85%) | 19.26 ± 2.53 | 0.8 | 71.26 ± 6.97 | 0.06 | 47.62 ± 5.33 | 0.09 | 109.12 ± 14.55 | 0.89 |
| Masters' | 15 (15%) | 19.22 ± 3.53 | | 73.59 ± 5.18 | | 45.71 ± 5.82 | | 109.17 ± 13.76 | |
| Job title | | | | | | | | | |
| Nurse | 90 (90%) | 18.2 ± 2.81 | 0.02 | 71.22 ± 5.77 | 0.02 | 46.88 ± 5.42 | 0.09 | 109.97 ± 14.24 | 0.03 |
| Head nurse | 10 (10%) | 21.10 ± 2.33 | | 72.69 ± 4.29 | | 49.08 ± 5.78 | | 114.73 ± 14.58 | |
| Marital status | | | | | | | | | |
| Single | 23 (23%) | 18.83 ± 4.01 | 0.35 | 71.86 ± 5.31 | 0.85 | 45.92 ± 5.99 | 0.08 | 104.93 ± 11.97 | 0.02 |
| Married | 77 (77%) | 19.42 ± 2.81 | | 71.68 ± 7.20 | | 47.69 ± 5.38 | | 110.29 ± 14.04 | |
| Department | | | | | | | | | |
| Medicine and Surgery | 56 (56%) | 18.83 ± 4.11 | 0.51 | 70.9 ± 4.93 | 0.18 | 45.85 ± 5.94 | 0.37 | 110.5 ± 14.06 | 0.05 |

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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| OR and emergency care | 30 (30%) | 19.12 ± 2.84 | | 71.3 ± 7.97 | | 46.74 ± 5.23 | | 107.73 ± 14.88 | |
| CCU | 14 (14%) | 20.72 ± 2.23 | | 72.75 ± 4.80 | | 49.74 ± 5.92 | | 109.92 ± 10.63 | |
| Use of corticosteroids | 15 (15%) | 19.69 ± 4.18 | 0.38 | 71.92 ± 5.32 | 0.85 | 45.15 ± 5.28 | 0.061 | 110.90 ± 16.76 | 0.90 |

**Table II: Association of KAP scores with nutritional behaviors**

| Variables | Nutritional behaviors | |
|---|---|---|
| | Pearson's coefficient | P |
| Knowledge | 0.39 | 0.001 |
| Attitudes | 0.39 | |
| Practices | 0.45 | |

**Table III: Multi-variate regression analysis**

| Variables | B (95% CI) | t | P value |
|---|---|---|---|
| Knowledge | 0.19 (0.28,1.21) | 3.10 | 0.003 |
| Attitude | 0.28 (0.40,0.79) | 4.78 | <0.001 |
| Practice | 0.41 (0.48,1.12) | 5.86 | <0.001 |
| Gender | -0.05 (-4.99,2.33) | -0.76 | 0.51 |
| Experience | -0.08 (-0.36,0.20) | -0.75 | 0.51 |
| Job title | 0.05 (-1.91, 4.11) | 0.69 | 0.52 |
| Marital status | 0.09 (-0.80, 8.38) | 1.55 | 0.08 |

## Discussion

The results of the study showed good knowledge, attitudes, practices, and nutritional behaviours in nurses regarding osteoporosis prevention. Nutritional behaviors were significantly associated with knowledge, attitude, and practice scores. These high scores are similar to other studies however there is also a lot of evidence to prove otherwise.7, 8 A study conducted on orthopaedic nurses showed unsatisfactory scores of knowledge and attitudes regarding osteoporosis.9 Other studies showed that adequate knowledge and attitudes were noted in students and nurses but practice, skills, and assessments were poor.10, 11 A comparison study between nurses and other healthcare professionals reported a comparatively low KAP score in nurses.12 These studies show that there is still a need for improvement to train nurses effectively.

Favourable nutritional behaviours were noted in our study as participants were engaged in the consumption of a healthy diet especially calcium-rich products to prevent osteoporosis. Similarly in another study, nurses had good behaviors and made significant lifestyle changes adding calcium to their daily intake to reduce the risk of osteoporosis.13 In contrast to this, nursing students have been reported to have unhealthy preferences such as no workout, excess consumption of coffee, and absence of milk in their diet leading to vitamin D and calcium deficiency and high sodium and cholesterol.14

A strong direct relationship between KAP and nutritional behaviors was noted in our study which is backed by previous literature. Chan et al reported the results of a systemic review revealing the association between KAP, nutritional habits, and lifestyle implying that people with low knowledge and myths tend to have poor practices due to wrongly perceived susceptibility to osteoporosis.15 Unhealthy lifestyles in adolescents and young adults may be because people believe that osteoporosis only occurs in old people.16 Hence, it is important for nurses to have high knowledge and healthier lifestyles to guide young people accordingly.

KAP scores were significantly based on gender, work experience, job titles, and marital status but they were not significant risk factors for nutritional behaviors. Previous studies also reported differences in osteoporosis KAP based on degree subjects, age, and sex.17 Further studies are needed to evaluate personal, social, and familial predictors of KAP and nutritional habits.

Our study has some limitations. We used assessment instruments not designed for nurses specifically so the findings may not be objective and generalized. Secondly, the questionnaires were self-reported so self-bias and personal conditions may have influenced results.

## Conclusion

Good knowledge, attitudes, practices, and nutritional behaviors were noted in nurses regarding osteoporosis prevention. The KAP scores had a direct and strong association with nutritional behaviors promoting lifestyle changes.

## Declarations

**Data Availability statement**

All data generated or analyzed during the study are included in the manuscript.

**Ethics approval and consent to participate.**

Approved by the department concerned. (IRBEC-NHM--0121/23)**Consent for publication**

Approved

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**Conflict of interest**

The authors declared an absence of conflict of interest.

**Authors Contribution**

***MUNAWAR SULTANA***
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***MUMTAZ SARDAR (Head Nurse)***
*Concept & Design of Study*

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