

# A DESCRIPTIVE STUDY TO ASSESS KNOWLEDGE, ATTITUDE, AND PRACTICES OF DEXA SCAN AMONG NURSES OF NEW DELHI HOSPITALS

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## Abstract

**Background:** Till this date DEXA scan is a best modality for diagnosis of osteoporosis. Osteoporosis is a familiar disease but treatable. Nurses carry a prime position in the prevention and treatment of osteoporosis. Knowledge about DEXA scan and osteoporosis helps nurses to make knowledgeable decision about health practices. There are seen lot of knowledge gaps regarding osteoporosis and DEXA scan among different health profession in India, including nurses. Moreover, very less studies are done on DEXA scan.

**Objectives:** The aim of this descriptive study was to assess knowledge, attitude, and practice of DEXA scan among nurses of New Delhi, India.

**Design:** The cross-sectional survey was carried out with use of observational descriptive approach design.

**Participant:** Total n=151 registered nurses participated in this study working actively for different hospital of New Delhi. These nurses varied in term of age, experience, and qualification.

**Method:** Researcher used the convenience sampling technique to conduct this study among the nurses. A self-structured questionnaire including 47 essential questions was framed to carry out the study and data was analyzed descriptively for knowledge component to draw a conclusion.

**Result:** During the study it was revealed that nurses have inadequate and limited knowledge regarding osteoporosis and DEXA scan. Out of 151 nurses, 83 were females and 68 were males, the mean age of participants was  $37.7 \pm 9.3$  years, less than 50 years (n=18) and above 50 years (n=10). In this study most of the study group was with work experience of 0-5 years (n=88) and have professional qualification of bachelor's Degree (n=68). It was seen that among 151 nurses only half of the nurses i.e., about 40%-54% of nurses were able to answer the questionnaire accurately. Their attitude towards given questionnaire was seen inadequate. The nurses who scored highest in the study, belongs to the study group of 0-5 years of experience and with qualification of bachelor's degree.

**Conclusion:** This study revealed that nurses of New Delhi hospitals have inadequate knowledge about DEXA scan and osteoporosis. Researcher is concluding this study with a point that effective measures should be taken into consideration to educate nurses regarding the practices of DEXA scan when the patient approaches for it which in turn will guide them towards a better patient care and help with the accurate diagnosis of the patients, and some measures should be initiated towards nurses' knowledge of osteoporosis so that it well helps in prevention and management of this disease. Healthcare organizations should introduce some online and offline workshop programs to aware and skill up these nurses and other health professional about the same.

**Keywords:** DEXA scan, Osteoporosis, BMD, Hospitals, Nurses, Knowledge, Practices, and Attitude

## Introduction

One of the major public health issues facing by most menopausal women and aging people of both sexes is Osteoporosis<sup>(1)</sup> According to recent static report of International Osteoporosis Foundation (IOF), it has been estimated that about 500 million people are currently affected by Osteoporosis globally, this has been estimated by using WHO definition of Osteoporosis, which states that approximately 6.3% of men over the age of 50 and 21.2% of women with same age range are prone to this disease worldwide. It has been also reported that 1-3 women over the age 50 and 1-5 men will encounter osteoporosis fractures in their lifespan.<sup>(3)</sup>

Osteoporosis is also a major health issue in India, previous report indicates that about 40% to 50% of Indian post-menopausal women are affected with osteoporosis, and rise is expected in this figure as Indian population is increasing.<sup>(4)</sup>

Osteoporosis is a skeletal disease characterised through compromised bone strength, which predisposes the man or woman to a multiplied threat of fractures of the hip, spine, and different skeletal sites. The scientific effects and monetary burden of this ailment name for measures to evaluate people who are at excessive threat to permit for suitable intervention. Many threat elements are related to osteoporotic fracture, which include low height bone mass, hormonal elements, the usage of positive drugs (e.g., glucocorticoids), cigarette smoking, low bodily activity, low consumption of calcium and diet D, race, small frame size, and a private or an own circle of relative's history of fracture. Osteoporotic fractures are more prone for older women than men.<sup>(5)</sup>

Costs of osteoporosis had been anticipated at US\$17 billion in 2005, specifically due to the fact of the wide variety of fractures that arise as a result. It is anticipated that through 2040, expenses related to osteoporotic fractures and their outcomes will double or triple as much as US fifty-one billion. These outcomes encompass ache and disability, which influence great of life (NOF, 2010). Because of the expenses and outcomes of osteoporosis, it is miles critical for health experts to develop interventions to save public and deal with this disease. Encouraging behaviours that promote bone fitness begins off evolved with making desired osteoporosis knowledge.<sup>(6)</sup>

Measurement of BMD levels plays a key role in the evaluation of osteoporosis and in the treatment of osteoporotic fractures. The favoured technique for measurement of BMD is to use DEXA Scan to calculate levels of BMD at the lumber spine and hip. The BMD levels are interpreted by using the WHO's T-scoring for diagnosis of Osteoporosis and Osteopenia. T-scoring are calculated by taking the distinction among a patient's measured BMD and the mean BMD in healthy younger adults, matched for gender and ethnic group, and expressing the distinction relative to the younger population standard deviation.

$$T\text{-score} = \frac{\text{Measured BMD} - \text{Young adult mean BMD}}{\text{Young adult population SD}}$$

Like T-scoring one more scale is used for interpretation of osteoporosis i.e., Z-scoring. Z-scoring is relatively same as T-scoring, besides that as a substitute of evaluating the patient's BMD with the younger person imply, it is as compared with the imply BMD predicted for the patient's peers (for example, for a healthful regular situation matched for age, gender, and ethnic group) <sup>(7)</sup>

$$Z\text{-score} = \frac{\text{Measured BMD} - \text{Age matched mean BMD}}{\text{Age matched population SD}}$$

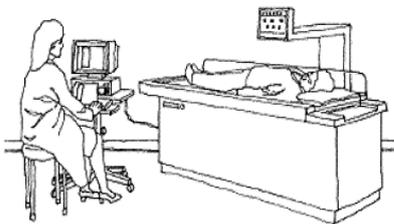
**What is it for?**

A DEXA (Dual Energy X-Ray Absorptiometry) scan measures how strong, or dense, your bones are. The results show how much risk there is of the bones fracturing.

**What will happen?**

The scan will take between 10 and 20 min and is not unpleasant or painful in any way. You will be asked to lie on a firm couch, fully clothed, whilst the machine takes the pictures. You will NOT go into a tunnel or have an injection.

**Is it safe?**



The scan is very safe and the dose of radiation is tiny – about the same as spending a day out in the sun.

**Fig A** – Shows diagram of DEXA machine and what it is and is it safe <sup>(16)</sup>

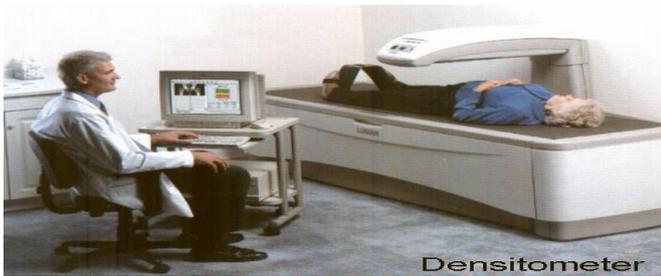
The 'gold-standard' approach for osteoporosis prognosis is through DEXA, which is predicated on the calculation of BMD at various sites, significantly the lumbar spine, hip, or distal radius. DEXA, however, is expensive, it makes use of ionizing radiation (albeit at secure levels), calls for the supervision of a certified radiographer and is, therefore, high-quality desirable for the precise/correct prognosis of osteoporosis. <sup>(18)</sup> As with many different diagnostic examinations, DEXA scans must be significantly assessed with the aid of using the interpreting doctor and densitometrist for abnormalities which could influence BMD measurements. In clinical practice, reputation of numerous artifacts and disease techniques which could have an impact on BMD effects may be of important significance withinside the highest quality interpretation of DEXA scans. <sup>(19)</sup>

Diagnosis	T-score
Normal	>-1.0
Osteopenia	<-1.0, >-2.5
Osteoporosis	<-2.5
Severe osteoporosis	<-2.5 plus fragility fractures

**Table A-** shows classification of osteoporosis according to WHO <sup>(19)</sup>

Several exclusive varieties of DXA structures are available, however all of them function on comparable principles. A radiation supply is geared toward a radiation detector located without delay contrary to the site to be measured. The affected person is positioned on a table withinside the route of the radiation beam. The supply/detector meeting is then scanned throughout the size region. The attenuation of the radiation beam is decided and is associated with the BMD. <sup>(7)</sup> The maximum critical information's to test is the accurate identity of the patient, his date of birth and additionally the intercourse and ethnicity which might be mandatory to calculate T-rankings. Sex is utilized by all manufacturers to calculate T-scoring (i.e., T-scoring for women is calculated the use of a woman normative database, at the same time as T-scoring for males are calculated the use of a male normative database). Although, all manufacturers use race in calculating Z-scoring, there's inconsistency withinside the manner race is treated whilst calculating T-rankings. Norland and Hologic are the use of race in calculating T-scoring (i.e., T-scoring for Caucasians are calculated the use of a Caucasian normative database, T-scoring for Blacks are calculated

the use of a normative database for Blacks); however, GE Lunar and recent Hologic machines use the database for young normal Caucasians to calculate scoring, regardless of the race of the subject. The ISCD recommends the latter technique to be used in North America because the use of race-adjusted T-scoring effects in a similar occurrence of 'osteoporosis' in each racial group, no matter the reality that age-unique fracture costs can be very different. <sup>(19)</sup>



**Fig B** – Shows DEXA Room with DEXA machine, patient, Radiographer, and console. <sup>(20)</sup>

## Need of the study

Spreading awareness about Osteoporosis and DEXA Scan among nurses. This point is raised based on personal experience during my internship period in Hospitals and experiencing that many working professionals including nurses are not very aware about DEXA studies. There has been tremendous increase in osteoporosis among the general public of India. Moreover, the Osteoporosis induced fractures that are more serious and the medical aid for their treatment is not very familiar in the public hospitals which are affordable by general public. Very limited research has been done in the area of DEXA scan; therefore, this study adds to the valuable knowledge about it, which can in turn help to increase awareness in people of India.

## Objectives of the study

- To assess the level of knowledge in nurses about Osteoporosis and DEXA Scan in view of their theoretical and practical aspects.

- To assess the knowledge of nurses regarding DEXA Scan with reference to their selected demographic variable such as qualification and work experience.

## Assumptions of the study

- The nurses will have sufficient knowledge about Osteoporosis but limited knowledge about DEXA Scan.
- The well qualified and experienced nurses will have better knowledge about DEXA Scan than their counterparts.

## Methodology

### Research Design:

- Cross-sectional survey

### Research Approach:

- Observational descriptive approach design

### Research Setting:

- Multiple Hospitals of New Delhi

### Population:

- Nurses working in multiple hospitals of New Delhi

### Sample Size:

- 151

### Sampling Technique:

- Convenience Sampling Technique

### Tools for Data Collection:

- Self-structured questionnaire.

### Statistical Method:

- Descriptive statistical method

## Sampling criteria

- **Inclusion criteria:**

Nurses (both male and female) who are working in multiple hospitals of New Delhi.

Participants who are willing to participate.

- **Exclusion criteria:**

Participants who are not willing to participate.

## Method

The Questionnaire based online survey entitled “*A descriptive study to assess knowledge, attitude, and practice of DEXA Scan among nurses of New Delhi Hospitals,*” was conducted among the registered nurses of New Delhi and the study was carried out Multiple Hospitals of New Delhi. The questionnaire was self-structured, and was first validated from three experts and then was examined and approved by the ETHICAL committee of JAMIA HAMDARD (Deemed to be University). Data collection and distribution platform\means include the electronic mails and other social media sources. Each participate was allotted the time span of 20min for illustrating the questions. The questionnaire related to the knowledge of DEXA scan and Osteoporosis was in the form of multiple choice, consists of 47 questions and was given to each participant. The questions of the questionnaire were divided into three sections.

1. The first section consists of questions related to social demographics, such as age, gender, qualification and work experience, no personal identifying data will be collected.

2. The second section consisted multiple choice questions about general knowledge of DEXA and Osteoporosis.

3. The Third section, which consisted of questions on practical aspects of DEXA.

The nurses were informed that their participation in this study will be entirely on a voluntary basis and their privacy will be confidential and anonymous. And the details will exclusively be used for the research purpose only before responding to the questionnaire.

## Results

The demographic attributes of respondents are shown in Table 2.

**Table 2: Respondents Demographic Attributes**

VARIABLE	CATEGORY	NO	%age
Age Group	20 – 30	99	66%
	30 – 40	24	16%
	40 – 50	18	12%
	50 – Above	10	6%
Gender	Female	83	55%
	Male	68	45%
	Others	0	0%
Qualification	Diploma	45	30%
	Bachelor’s	68	45%
	Master’s	38	25%
Experience	0 – 5 years	88	58%
	5 – 10 years	31	21%
	10 – 15 years	21	14%
	15 years above	11	7%

In this study the sample size (n) for Nurses consists 151 samples (n=151) out of which 45% were males and 55% were females. Out of 151 respondents only 6% respondents are 50 above years age, 12% were from age group of 40-60 years, 16% were from age group of 30-40 years and the maximum samples i.e., 66% were from age group of 20-30 years. 58% of the total respondents were having 0-5 years of clinical experience. The maximum samples have Bachelor's qualification i.e., 45%. (See Table No. 2)

**Table 3: Responses of Nurses in Respect of DEXA and Osteoporosis**

QUESTION	CORRECT NO / %age	INCORRECT NO / %age
DEXA stands for?	95 (62.9%)	56 (37.1%)
Does DEXA scan use x-rays?	87 (57%)	64 (43%)
DEXA scan is mostly used to diagnose?	113 (74.8%)	38 (25.2%)
Is bone scanning same as DEXA scan?	51 (33.8%)	100 (66.2%)
Are dexamethasone and DEXA same?	91 (60.2%)	60 (39.8%)
Uses of DEXA scan is	110 (72.8%)	41 (27.2%)
Is DEXA contraindicated during pregnancy?	74 (49%)	77 (51%)
At what age is a DEXA scan recommended?	70 (46.4%)	81 (53.6%)
What is osteoporosis?	65 (43%)	86 (57%)
BMD stands for?	87 (57.6%)	64 (42.4%)
The only technique done for detecting osteoporosis is:	74 (49.1%)	77 (50.9%)
Vulnerable age group for osteoporosis is?	60 (39.7%)	91 (60.3%)
The major cause of osteoporosis is hormonal balance in both men and women, that is androgen and oestrogen vice versa?	62 (41%)	89 (59%)
Gender based vulnerability of osteoporosis?	77 (51%)	74 (49%)
The risk factor for osteoporosis is?	88 (58.3%)	63 (41.7%)
Does anti-resorptive drugs are given to treat osteoporosis?	60 (39.7%)	91 (60.3%)
Which of these foods are good in fighting with osteoporosis?	95 (62.9%)	56 (37.1%)
Have you ever heard about hormonal therapies while dealing with osteoporotic patients?	40 (26.5%)	111 (73.5%)

**Table 4: Responses of Nurses in Respect of Practical aspects of DEXA**

QUESTION	CORRECT NO/%age	INCORRECT NO/%age
Frequency to perform DEXA scan during the life span of patient with osteoporosis?	38 (25.2%)	113 (74.8%)
Frequency to perform DEXA scan in normal patient?	38 (25.2%)	113 (74.8%)
Do we need fasting prior to DEXA scan?	84 (56%)	67 (44%)
Are calcium and multi vitamin supplements allowed to take prior to DEXA scan?	75 (49.7%)	76 (50.3%)
Metal objects should not be taken out before or during scan and there is also no need to wear any loose cloth	75 (49.7%)	76 (50.3%)
Do we check height and weight of patient before DEXA scan?	88 (58.3%)	63 (41.7%)
Do we ask female patient about her menopausal status and LMP?	113 (74.8%)	38 (25.2%)
Do we use contrast media in DEXA scan?	76 (50.3%)	75 (49.7%)
Is there any after care for DEXA scan?	73 (48.3%)	78 (51.7%)
Can we perform DEXA scan on patients who have been recently undergone any barium studies?	86 (57%)	65 (43%)
If you are assisting any IPD patient in DEXA room, is it necessary for you to wear lead apron during scan?	98 (65%)	53 (35%)

## Discussion

The purpose of this study was to assess the knowledge, attitude, and practices of DEXA scan among nurses of New Delhi. The study includes some questions regarding osteoporosis but most of cross-examine is about DEXA scan.

Many studies are done on knowledge of Osteoporosis among different health professionals worldwide and in India. The previous studies stated that nurses have inadequate and moderate knowledge about osteoporosis. This study is the first from India to assess the state of nurse's knowledge regarding DEXA scan. Osteoporosis is a massive medical issue, specifically with a growth in growing old population. The cornerstone of prevention of osteoporosis is to enhance know-how and attention amongst medical professionals. <sup>(12)</sup>

Till date the foremost test to detect osteoporosis is DEXA scan, so the knowledge of DEXA among health professionals should be known but, in this study, only nurses are selected for participation. The purpose of selecting only nurses as a study participant was that in India maximum nurses are females and females are at high risk for osteoporosis and the other purpose of selecting nurses is that their job is very challenging due to their extreme work load which leads them to have very tough lifestyle where they are unable to take care of themselves which steer them at high risk for osteoporosis and the foremost purpose of selecting nurses as a participant for the study is that they deal with all kind of patients in which osteoporotic patients are one, so it's important that they should have enough knowledge about DEXA scan. Unfortunately, the overall result of this study showed that nurses have limited or inadequate knowledge about osteoporosis and DEXA scan.

This study was small scale and descriptive. The participants in the study expressed limited and inadequate knowledge of osteoporosis and DEXA scan.

Concerning the queries about osteoporosis, the maximum of participants demonstrated a limited level of knowledge, however, a small difference in knowledge of osteoporosis was found in two queries assessing risk factors of Osteoporo-

-sis and foods that help in fighting with osteoporosis with accurate responses of 58.3% and 62.9% respectively. These results were higher than what we observed for other queries. About qualification and work experience years, there were seen significant differences in the levels of osteoporosis knowledge of nurses between several groups. Overall, in this study it was found that freshers with least experience had better knowledge of osteoporosis than other groups. This deviation of results is possibly attributed to our small sample, however can also be connected to the heterogeneity of our observed participants.

With reference to DEXA scan related questions, the mass of the nurses illustrated an inadequate level of knowledge. However, a difference in knowledge of DEXA scan was ascertained in three questions assessing need of lead apron during DEXA scan, uses of DEXA scan and diagnosis of DEXA scan with correct answers only of 65%, 72.8% and 78.8% respectively. About length of experience and qualification no significant differences in the degree of DEXA scan knowledge between the different groups.

This study is an attempt to identify the level of knowledge among nurses of New Delhi, and our results were disappointed as only half of the participants having precedent knowledge about DEXA scan and osteoporosis. The results of this study a real eye opener about the inadequate knowledge of osteoporosis among nurses. The study is concluded on the point that interest

should be given to aware nurses about osteoporosis and DEXA scan, so that nurses perceive their knowledge to high levels. The awareness is needed because nurse's role in association with osteoporosis and DEXA scan is according to me is important pillar of better patient care because nurses are more concerned with the patient care than other health professionals. Nurses character in the area of osteoporosis includes patient preparation for DEXA scan, after care of DEXA scan, protection of patient and themselves during scan, in guiding patient about whole procedure of DEXA scan, it also includes, various factors of counselling which consists of screening for the disease (osteoporosis), advising a health full way of life behaviour, giving details on medicine and dietary supplements and on fall prevention. The diversity of the factors applicable to nurses' involvement stresses the significance of supplying them persevering with training to enhance their knowledge. To aware nurses regarding osteoporosis and DEXA we should start training applications to provide them sufficient knowledge. On the alternative hand, there should be implementation of instructional applications for nurses with the aid of using health centre control. It is far better to have offline face to face in instructional applications, that are much efficient in comparison online media education.

After compilation of this survey, when I came to know about results than I started sending Emails to the respondents of this survey on their respective Email ID's. In which I have attached a PDF, which includes the questionnaire of the survey with correct answers and with their proper explanations.

The use of convenience sample technique limited this study, because convenience sample technique does not allow us to speculate results from all nurses. This study was conducted only in multiple hospitals of New Delhi which does not allow us to gain results from other states of India. The nurses showed less interest in participating with the survey, which leads to the small sample size and results were limited.

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