An-Najah University
Faculty of Graduate Studies

Osteoporosis among the Inhabitance of Jenin District

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Committee Decision

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بسم الله الرحمن الرحيم

(و علمك ما لم تكن تعلم و كان فضل الله عليك عظيما)

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النساء 113

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اهداء

الى الذين ساروا مع الفجر ليخطوا لنا طريق العودة.....شهدائنا

الى نبع الحنان و المحبه .....امي الغاليه

الىرمز البذل والعطاء .....ابي الحبيب

الى من هم عنوان سعادتي .....اخواني

الى أجمل هدية من السماء .....اصدقائي

الى الشموع التي تحترق لتضيء لنا طريقنا .....اساتذتي

الى من نحب

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Abstract

Osteoporosis is a common metabolic bone disease; it is a major cause of illness, fractures and death in adults. The present study aimed at evaluating the status of this disease and tried to search for possible associated risk factors among the inhabitants of Jenin district, northern Palestine.

To achieve our aims a total of 165 subjects (69M / 96F, aged 25-75) suffering from bone fractures, referrals of the orthopaedic clinic at Jenin Hospital, were interviewed and data regarding their health status, family history of disease, physical activities and other related data was collected in a specially designed questionnaire.

The findings among our study population showed that the highest rate of fractures occurred in spine (21.8%), followed by fractures of the hip (16.4%), wrist (14.5%) and ribs (10.9%). With respect to gender differences, females showed a higher frequency (60% of total fractures) compared to males. In general, a noticeable increase in fracture frequency was observed with increasing age.

It was also found that with advanced age, there is a clear tendency towards loss of heights, while weight variations did not show any significant changes.

Data on family history for affected patients seems to indicate that family history is a risk factor as all study population subjects were found

to have sibs and parents with history of fractures at various sites. An interesting finding was the finding of more spine and hip fractures among mothers and sisters of patients, while fathers and brothers seems to show much higher frequency in wrist fractures.

The finding with respect of secondary osteoporotic diseases among our study population showed that chronic rheumatic diseases were the most common (25.5%), followed by kidney related diseases (21.8%) and malabsorption (12.7%). Other secondary osteoporotic diseases related to hypo and hyper thyroidism and parathyroidism were represented by very small percentages.

Early menarche and menopausal age seems to be risk factors for developing osteoporosis. The findings of the current study showed that around 50% of the female population were with early menopause and around 40% had early menarche. This finding partially explains the observed discrepancy in fracture occurrence among males and females in our population.

Data on physical activity practices among study population seems to indicate that the majority of the patients have limited activities, thus rendering this group to be at high risk of developing osteoporosis. Our findings with respect to calcium rich diets indicates that the studied population have limited use of such diets (hard and soft cheese and milk; calcium supplementation) especially at ages below 25 years of age. Lack

of proper balance diet especially at this age is a well known risk factor of osteoporosis. Findings on milk consumption also indicate that the majority of the studied population consume limited amounts of milk at all stages of life, a situation which also considered as a risk of osteoporotic disease. The study also paid attention to other factor related to causes of osteoporosis such as oestrogen intake by females at menopausal age, breast feeding, and use of caffeine, soft drinks and others.

1.1 What is osteoporosis

Osteoporosis is defined as a disease characterized by low bone mass and micro-architectural deterioration of bone tissue, leading to enhanced bone fragility and an increase in fractures risk. Bone is normally mineralized but in the case of osteoporotic disease it becomes deficient in quantity, quality and structural integrity (Parveen K. and Micheal C., 1997). It is the most common metabolic bone disease, which characterized by a parallel reduction in bone mineral and bone matrix so that bone is decreased in amount but is of normal composition (Bennet N. and Plum R., 1997).

The World Health Organization (WHO) defines osteoporosis as bone density more than 2.5 standard deviations (SDs) below the young adult mean value for individuals matched for sex and race. Values between 1 and 2.5 SDs are termed 'Osteopenia' (Parveen K. and Micheal C., 1997).

Osteoporosis is a major cause of illness and death in the elderly. It is characterized by low bone mass leading to an increased risk of fracture particularly of the spine, hip, and wrist (John A., 1996). Osteoporosis is mostly asymptomatic, it is associated with significant mortality and morbidity. One in three women and one in five men surviving to 80 years of age will suffer a hip fracture. The cost of health care, so called

"fragility" fractures may be high (Composten E., and Clifford J. 1999; Elaine N., 1997).

The shortcomings of the above definitions led the World Health Organization (WHO) to convene a new panel of experts to define just what is meant by the term low bone mass (MRC Environmental Epidemiology Unit, 1996). The group began their deliberations by agreeing on two basic concepts. First, they assumed that fracture risk must be lowest when bone mineral density (BMD) is highest, which usually occur at ages 20 to 40 in healthy people. Second, the expert panel agreed, on the basis of several studies (Christopher H., Edwin R., John. A., *et al.*, 1999), that relative risk for fracture doubles for each standard deviation (SD) decrement in BMD. Thus, in patients in who is BMD is 1 SD below the mean for peak bone mass, the relative risk is 2.0. If the value is 2 SD below the mean, the risk doubles to 4.0. The relationship between BMD and fracture risk is continuous, and there is no fracture threshold. With these concepts in mind, the WHO panel developed the following working definitions:

- Normal bone is defined as BMD less than or equal to 1.0 SD below the mean for peak bone mass.
- Low bone mass (osteopenia) is defined as more than 1.0 but less than or equal to 2.5 SD below the mean.
- Osteoporosis is defined as more than 2.5 SD below the mean.

These definitions were developed for epidemiologic studies but have been adopted as "diagnostic criteria". In fact, alendronate sodium (Fosamax), a drug recently approved by the Food and Drug Administration for treatment of osteoporosis, carries product labelling information indicating that BMD 2 SD below the mean is appropriate for starting therapy (The Food and Drug Administration, 1996).

1.2 Previous studies

Osteoprotic fractures are painless because they are compression fractures. They occur in hips, vertebrae, and wrists are the main problem in public health (The National Institute of Health, 2000). At about the age of 50 years old, the disease prevalence is about 40% in women and 30% in men (The National Institute of Health, 2000). Other fractures, particularly these of the pelvis and humours are also significantly cause morbidity in the elderly (John A., 1996).

In UK, an estimate of 60000 hips fractures, 5000 radius and 40000 vertebrae fractures are annually clinically diagnosed. In USA the similar fractures estimation for the same organs respectively, are 300000, 500000, and 200000 (Composten E. and Clifford J., 1999). More than 1.5 million Americans experience osteoporotic fractures each year. About 80% of these fractures occur in women, often at or shortly after menopause (McGarry K.A. and Kiel D.P., 2000).

1.2.1 Bone mineral density

Bone Mineral Density (B.M.D) is implicit in the definitions of osteoporosis, and is a strong predictor for subsequent fracture. With these definitions, it has been possible to estimate the prevalence of osteoporosis within different populations. In UK the prevalence of established osteoporosis in women aged 50-54 years is 3.5% at the lumber spine, 2.0% at femoral neck, 15% at the spine and 20% at the hip (Composten E. and Clifford J., 1999).

The National Osteoporosis Foundation describes bone mass as analogous to a bank account into which, a person's childhood, adolescence, and early adulthood, new bone "deposits" are made to the skeleton faster than old bone is "withdrawn. After age 30, the rate of withdrawal exceeds the rate of deposit; therefore, establishing healthy bone mass in the childhood and early adulthood is crucial (National Osteoporosis Foundation, 1998).

1.2.2 Hip fracture

The incidence of hip fracture, that is may be caused by likelihood fall down from upright, increase with age (The National Institute of Health, 2000). At the age of 50 the ratio between females and males is 2:1 and the aetiology of hip fractures include the frequency of falls.

After hip fracture, only 50% of patients regain the same level of independence that they had before the injury, and 12% to 40% of them die within 6 months (Kelly A., Douglas P., *et al.,* 2000; Gregg E.W., Cauley J.A., Seeley D.G., *et al.,* 1998). It is important to note that death following hip fracture in some cases is mostly due to complications following fracture like hypoststic pneumonia and pulmonary embolism.

The osteoporotic fractures have become more common in the recent decades, but this specific increase may now be stabilizing in some countries (John A., 1996). Concerning the population ages, the number of hip fractures is expected to increase from 1.7 million in 1990 to 6.3 million in 2050 (Composten E. and Clifford J., 1999; Kelly A., Douglas P., *et al.,* 2000). The same study and others have projected that, by the year 2050, more than half of all hip fractures will be occurring in Asia (Composten E. and Clifford J., 1999; Cooper C., Compsten E.G. and Melton, L.J., 1992).

There is a worldwide seasonal variation in hip fractures, with the highest rate of occurrence in winter. This may be a consequence of the cold conditions which increase the likelihood of both fall and reduction of vitamin D levels due to low sunlight exposure. Hip fractures are most common in northern European countries and from their descendents to North America. Most countries have seen a doubling in rate of hip

fractures over the last 30 years, but the rates now appear to be plateau (Composten E. and Clifford J., 1999).

1.2.3 Vertebral fracture

Vertebral fractures are commonly asymptomatic and the prevalence estimates can only be reliably obtained by radiological survey of the thoracolumar spine. Recent data from the European vertebral osteoporosis study has suggested an over all prevalence of vertebral deformity of approximately 12% in both sexes. Spinal deformity was more common in younger males compared to females, probably as a consequence of occupation and trauma. This difference in prevalence rate between the sexes was reversed in old age (Composten E. and Clifford J., 1999). The incidence of vertebral fractures is less well documented than hip fractures, but for clinically diagnosed fractures, there is an exponential increase with age in men, where as a more linear age-related increase is seen in women and ratio of females/males was found to be 2/1 Cooper and others 1992).

1.2.4 Forearm fracture

Wrist fractures occur due to fall on out stretched hand and occurs an inch proximal to wrist joints and known as Colle's fractures. Incidence of Forearm fractures in women increase linearly with age (Orthopedic and Pharmacologic Strategies, 1997) and then plateau (Composten E. and

Clifford J., 1999). In women the increasing osteoporosis fractures are seen between the ages of 45-65, whereas in males the incidence remains almost constant between 20 to 80 years. The age-adjusted sex ratio for these fractures is 4:1 females to males. This is more marked than for both hip and vertebral fractures. There is a seasonal variation in the incidence of wrist fractures that reported, for the out-stretched arm to occur mostly during the winter months (The National Institute of Health,.2000 , Composten E and Clifford J., 1999).

1.2.5 Mortality and morbidity

1.2.5.1 Mortality

Mortality attributable to osteoporosis results largely from hip fractures. Hip fracture causes a 12-20% reduction in expected survival (Cummings S.R., Kelsey J.I., Nevitt Mc., 1985). Hospital-based studies have shown that mortality rates are higher in men (Sexson S.B, Lehner J.T., 1989), older patients (Kellies E., Brody J.A., 1990) and in non-white populations (Kellies E., Brody J.A., 1990; Myers A.H., Bobinson E.K., Van Natta M.L., 1991). Such observations can be explained by the difference in the prevalence of chronic and degenerative disease in population subgroups (Magazinar J. and Simonsick EM, *et al.*, 1989). Most of the excess mortality occurs in the 6 months after a hip fracture (Weissns L. *et al.*, 1983).

1.2.5.2 Morbidity and quality of life

Many of hip fracture patients become permanently disabled. The percentage of patients who cannot walk rises from 20% to 50% after a hip fracture (Holbrook T.L., Grazier K., Kelsely J.L., *et al.*, 1984). Up to a third becomes totally dependent, necessitating institutionalization (Boner SK, Tinetti M.E., Speechley M., *et al.*, 1990). Although vertebral fracture causes fewer deaths than hip fracture, but it affects morbidity and quality of life considerably. Demonstrated in two separate studies (Ettinger B , Block JE , smith R, *et al*,. 1988, Ettinger B, Black DM, Neuitt M.C., *et al.*, 1992) that vertebral fracture caused significant back pain, disability and height loss in Americans.

1.3 Etiology

1.3.1 Age-associated bone loss

Osteoportic fractures become more common with increasing age (John A., 1996). Osteoporosis is the gradual decline in bone mass with age, leading to increased bone fragility and fractures. The majority of osteoporotic fractures occur in older women, due to a natural decline in bone density after the menopause stage. The risk of suffering such a fracture over the course of life is about 40% for women and 13% for men (Reid I.R., Arnes R.W., Evans M.C., *el al.*, 1995). Increase risk of

fracture due to chronic imbalance in bone resorption and formation leads to bone loss (Composten E. and Clifford J., 1999).

1.3.2 Calcium and vitamin D effectiveness

Calcium and vitamin D are integral to bone mineralization. In one study (Reid IR, Arnes RW, Evans MC, *et al.*, 1995) the risk of symptomatic fractures was significantly reduced in healthy postmenopausal women who received calcium supplementation rather than placebo. The risk of fracture reduced from 17.5 percent to 5.3 percent (an absolute risk reduction of 12.2 percent).

A three-year study (Tilyard M.W., Spears G.F., Thomson J., *et al.*, 1992) in postmenopausal women with osteoporosis compared the effects of 0.25 mg per day of calcitriol (Rocaltrol; vitamin D) with 1000 mg per day of elemental calcium. Calcitriol was found to prevent one more fracture for every 36 patient's years of treatment. This finding represented a risk reduction from 10 percent to 5.2 percent (an absolute risk reduction of 4.8 percent).

The use of combined calcium and vitamin D was evaluated in the studies. (Chapuy M.C., Arlot M.E., Delmas P.D., *et al.*, 1994, Dawson-Hughes B., Harris S.S., Krall E.A., 1997, Pacific I., 1996) which included 3.200 healthy female residents of nursing homes and assisted living facilities, and a community population of 389 men and women over the

age of 65 years old. Thesė studies mentioned that, at least one fracture was prevented for every 45 patient-years of treatment. This corresponded to a reduction in fracture risk from 31.8 percent to 25 percent in the residential study and from 12.9 percent to 5.9 percent among the community dwellers.

Estrogen (or androgen) deprivation can produce bone loss in elderly. Calcium or vitamin D deficiency, and secondary hyperparathyroidism can account for bone resorption rates that equal or exceed menopausal levels. Although older people tend to consume less calcium, there are other factors that contribute to a state of relative calcium deficiency. In particular, ageing is associated with reduced synthesis of 1, 25-dihydroxyvitamin D, the active vitamin D metabolite, and reduced production of a major vitamin D precursor in the skin. The reduction in (these vitamin D compounds) contributes to lower calcium absorption, which leads to increased secretion of parathyroid hormone (PTH) and enhanced bone resorption (John, A., 1996).

1.3.3 Other factors influencing bone loss

Significant bone loss can be caused by other factors which usually resulted in increased bone resorption and\or reduced bone formation. These factors include:

- Excess thyroid hormone levels

- Therapeutic use of glucocorticoids
- Immunosuppressant therapy
- Chronic anticonvulsant therapy

Glucocotricoids are particularly damaging to bone because these agents simultaneously increase resorption and decrease formation. In addition, cells associated with hematological malignancies, such as multiple myeloma, lymphoma and leukemia, can secrete large amounts of bone resorption without a compensatory rise in bone formation (John A., 1996).

1.3.4 Sex-related bone loss

Osteoporotic fractures at all sites are more common in women than men; about 70-80% occur in women (Pacific I., 1996). A woman's risk of fracturing her hip is the same as her breast, uterine and ovarian cancer risk all combined together (Watts N.B., 1998). Men tend to develop osteoporosis 10 years later in life than women. This is may be because men have more muscle mass and, therefore, denser bones than women at maturity, so bone loss starts later and progresses more slowly. There are obvious differences between men and women that make this disease distinct for each gender; sex steroid levels (more estrogen in women, testosterone in men), men are muscular and generally exercise more, have different diets, and there are a variety of other hormonal differences

(McEvoy G., 1999). However, age appears to be the great equalizer. While women lose bone mass rapidly in the years following menopause, but by age 70 women and men lose bone mass at the same rate, and calcium absorption decreases in both sexes. Osteoporosis goes largely undetected in men, often until multiple fractures raise suspicions. "There is a much lower level of awareness among physicians about osteoporosis and men (McEvoy G., 1999).

1.3.5 Race

The incidence of osteoporotic fractures is similar in different ethnic groups living in the same country, except in Afro-Caribbean's, and American blacks in whom it is relatively low. (American College of Rheumatology Task Force on Osteoporosis Guidelines)

1.3.6 Genetics

The family history of osteoporosis increase the risk of fracture, and a study was suggested a significant genetic component (Karl O., 1997). This study demonstrated that 80% of bone mass is determined by genetic factors; thus only 20% is subject to modulation by environmental factors. Daughters of mothers with osteoporosis also exhibit lower bone mass than age-matched daughters of mothers without osteoporosis (Karl O., 1997).

1.3.7 Pharmacological factor

The most commonly used pharmacologic treatments for osteoporosis (excluding calcium and vitamin D supplements) are anti-resorptive agents (estrogen, bisphosphonates, calcitonins, and selective estrogen receptor modulators). Other agents under development or already in use outside the United States include fluoride salts, parathyroid hormone, active forms of vitamin D (calcitriol, alfacalcidol), and anabolic steroids (McEvoy G., 1999).

1.3.8 Hormonal replacement therapy (HRT)

The utility of HRT (estrogen) for prevention of bone loss in early menopause is well established. HRT that is started at menopause retards or prevents bone loss and increases BMD. HRT continues to prevent bone loss for as long as it is taken, but bone loss resumes when estrogen is discontinued (Pacific I., 1996, Watts N.B., 1998). HRT is also effective in older women with established osteoporosis. Added potential benefits of HRT include controlling menopausal symptoms and reducing the risk of heart disease. Despite its documented benefits, however, some women find that the side-effect profile of HRT (e.g., breast tenderness, abnormal uterine bleeding, endometrial hyperplasia, migraine, deep venous thrombosis) is unacceptable. Additionally, women may fear the relationship between HRT and breast cancer. Nevertheless, hormone

replacement is considered first-line therapy in most postmenopausal patients (McEvoy G., 1999).

1.4. Pathophysiology

Fractures are the complication result of osteoporosis, as strokes are the complication result of hypertension. Low bone mass is the most important predisposing factor for osteoporotic fractures. Bone mass is affected by beak bone mass and the degree of subsequent bone loss. These tow processes are regulated at the level of the bone remodelling unites, which in turn are responsive to an interaction between genetic and environmental factors (John A., 1996). Fractures occur in patients with decreased bone strength who experience an injury. Thus, the pathophysiology of fractures encompasses a multitude of factors which determined bone strength (bone mass, bone quality, age and skeletal geometry) and the frequency nature of injuries (Composten E. and Clifford J., 1999).

1.4.1 Peak bone mass

The level of bone mass in adults determined by the level of peak bone mass acquired during skeletal maturation and by the rate and duration of bone loss which occurs there after; peak bone mass is attained by age of 20-25 years old and is influenced by both genetic and environmental factors (John A., 1996, Composten E. and Clifford J.,

1999). The role of heredity, in determining peak bone mass, is dominant and accounts for 60-80% of the variance in the peak bone mass (Composten E. and Clifford J., 1999). Increase supplement of calcium intake in children and adolescents results in a modest increase in bone mass, but the extent to which this effects the final peak bones mass is not yet clear. Growing children and young adult who habitually are more physically active can optimize their bone mineral density and thereafter have higher bone mass than their sedentary peers. Young adults of both genders who experience a delay in puberty or transient intervals of sex steroid deficiency after puberty seem to have lower peak bone mass (Composten E. and Clifford J., 1999).

It is evident that several factors interact to regulate peak bone density (Composten E. and Clifford J., 1999). The most important of these are genetic determinants. However, studies in twin have shown that genetic regulation of peak bone mass can be modified by both hormonal and environmental factors, even in people with a genetic predisposition to low bone mass (Composten E. and Clifford J., 1999).

1.4.2 Bone quality

When bone losses occur, there are changes in architectural and impairment in skeletal strength. The number of trabecular plates decrease as does the "connectedness" of the trabecular network. Bone

mass relative called "quality" (Cooper C., Compsten E., Melton G., 1992).

1.4.3 Hormonal influence

During the menopause, estrogen deprivation enhances the rate of bone dissolution. Although bone formation is accelerated in attempt to match this increased rate of resorption, the time required for bone formation does not permit this process to completely match resorption. The end result is a net loss of bone, for example a 45-years-old woman with early menopause shows increased risk of osteoprotic fractures because of the accelerated bone loss that occurs after oestrogen deprivation. In contrast, the increased risk in a 50-years-old woman with a strong family history of osteoporosis is mainly caused by impaired acquisition of peak bone mass. Young menorrheal athletes are at even higher risk of osteoporosis because of both impaired acquisition of peak bone mass and accelerated bone loss (American College of Rheumatology Task Force on Osteoporosis Guidelines, 1996).

1.5 Pathogenesis of osteoporosis

Osteoporosis is defined pathologically as" a systemic disease causing an absolute decrease in the amount of bone and micro structural changes, leading to skeletal fragility and consequent fractures after minimal trauma (low energy fractures). Osteoporosis considered being

either secondary osteoporosis (that is osteoporosis due to underlying specific diseases) or idiopathic osteoporosis. The ratio is different between females and males, around 20% of women is found to have secondary osteoporosis, the remaining 80% are diagnosed with idiopathic and secondary osteoporosis of about 50\50 (Composten E. and Clifford J., 1999).

1.5.1 Secondary osteoporosis

The main causes of secondary osteoporosis are summarized into:

- Hormonal causes as in hypogonadism, Cushings syndrome, hyperthyroidism and Acromegaly.
- Nutritional causes: it is affect the skeletal via impaired supply of calcium and vitamin D, leading to secondary osteomalacia as after gastric resections and short bowel syndromes.
- Hereditary causes: are common denominator behind osteoporosis associated with hereditary disorders of bone, it is impaired quality of bone matrix due to disturbance in collagen synthesis.
- Rheumatological disease: characterized by inflammatory processes which is stimulating osteoclastic activity leads to increased bone resorption and bone loss.
- Hematological disease

- Other causes like immobilization, diffuse met static disease...etc.

Drugs and lifestyle factors causing osteoporosis: some drugs increase the risk for osteoporotic fracture, as glucocorticoids, cytotoxic drugs, conadotropin-releasing hormone agonist, heparin, lithium, anticonvulsants, excessive alcohol, cigarette smoking. (Karl O., 1997)

1.5.2 Idiopathic osteoporosis

A diagnosis of idiopathic osteoporosis can be made when there is no demonstrable underlying causes, it can be divided into two types. Type I osteoporosis which is directly linked to the loss of ovarian function after menopause and Type II osteoporosis which is considered a mere exaggeration of the physiological aging processes in the skeleton.

The causes of idiopathic osteoporosis are multi factorial and the roles of many factors are still poorly characterized. The list below is meant to be as a summary of current knowledge with relative importance to the different factors (Karl O., 1997).

1. Genetic determinants of bone mass: Osteoporosis is a polygenic disease; therefore no single gene will provide sufficient information in relation to prediction of future fracture risk. The studies have demonstrated that 80% of bone loss mass is determined by genetic factors (Karl O., 1997).

2. Menopause: The menopause normally occurs at the age of 51-52 years within a range of 42-60 years. It is generally accepted that an early menopause is associated with osteoporotic fractures. Estrogen treatment was proven to reduce bone turnover by 50%. Women treated with combined cyclic estrogen progesterone, regimen did not exhibit the increase in osteoclastic activity.

3. Nutrition (calcium intake): The calcium ion is crucial for several important functions in the body (nerve function, muscles function, mineralization of bone, control of intracellular processes...ect). Therefore, the serum level of calcium must be kept within narrow limits, and also several hormonal systems which participate in calcium control. Calcium which absorbed in the gut through the action of vitamin D and the gut epithelium, leading to the synthesis of calcium transporting protein. Calcium is then transported via the blood stream to bone where it is incorporated in the bone matrix during calcification (Karl O., 1997).

4. Physical activity: Osteoblasts are sensitive to mechanical stress, the skeleton needs continuous physical stimulation, otherwise bone loss ensues. Women with a reasonable level of physical activity have a higher bone mineral content than less active women. Activities involving anti gravity exercises (e.g. dancing or running) seem to be more effective than swimming. It is necessary to stress the term, moderate physical activity, because excessive physical activity in young women may

produce hypothalamic amenorrhea with estrogen deficiency (Karl O., 1997).

5. Body weight: Obesity may protect the skeleton in several ways:

a. By increased extra glandular production of estrange in fatty tissue

b. Improved vitamin D storage in fatty tissues.

c. By providing a cushioning effect

d. By creating a larger skeleton due to increased weight bearing (Karl O., 1997).

1.6. Risk factors

The historical risk factors are important when counseling women as to whether they should take estrogen or not, which constitute the best guidelines for counseling. Other variables such as thickness of skin or hair and \or joint hyper mobility have been used as indicators of poor collagen synthesis, but their discriminative power still needs to be investigated on a large scale, which may include the following:

Early menopause, before age 45; race; certain medication; certain conditions such as malabsorption; small body frame; family history; hypogonadism (including premature menopause) (Composten E. and Clifford J., 1999)

Other reported risk factors include breast and prostate cancer. It is known that in males, due to prostate, the picture is mosaic due to

bone re absorption and new bone formation. The site of metastasis for breast will be in the lower dorsal spine, and here it might appear before metastasis in lung due to net work of venous system (personal communication; Dr. Osama Bishtawi).

1.6.1 Bone Loss

Skeletal effects of glucocorticoids are dose-dependent, the doses at or above 7.5 mg/day resulting in significant bone loss that increase fracture risk. No threshold dose, below which bone loss does not occur, has been identified. Bone loss is most rapid during the first 6 months of treatment, with trabecular bone affected to a greater degree than cortical bone. Loss continues for the duration of treatment (McEvoy G., 1999). Increased rates of bone loss have also been demonstrated with high doses of inhaled formulations and with alternate-day glucocorticoid regimens (American College of Rheumatology Task Force on Osteoporosis Guidelines, 1996).

Bisphosphonates have been proven to be highly effective in primary and secondary prevention of glucocorticoid-induced osteoporosis in men and women (Ropert J., 1997; Saag KG, Emkey R, Schnitzer T.J., *et al.,* 1998 and Reid D., Cohen S., Oack S., *et al.,* 1998). Calcitonin also prevents corticosteroid-induced bone loss (Healey J.H.; Paget S.A., Williams-Russo P, *et al.,* 1996)

1.7 Aims of study

The pathology of fractures encompasses a multitude of factors that determined bone strength. These factors mainly include, bone mass, bone quality, age, skeletal geometry, fracture frequency, nature of and effects of injuries (Composten E. and Clifford J., 1999).

The objective of the present study encompasses the etiology of the human bone fractures. This can be helpful for the elevation of awareness and for widening the perception of the people in Jenin district, where the study carried out, and may be in all Palestine as well. Taking the above consideration in mind, the present study aimed at:

1. Elaborate the status of osteoporosis among the inhabitance of Jenin district.
2. Searching for associated risk factors with osteoporosis in the region.

CHAPTER II

Methodology and Techniques

2.1 Questionnaire

In this retrospective study, a designed structural questionnaire was used after being piloted. The questionnaire included 23 questions, filled by the researcher at time of intervening patients, divided into four categories related to:

1. Demographic data including age, gender, place of living....

2. Medical information concerning family history of disease, secondary osteoporosis, and related data in patients files.

3. Women related data on menopausal age, menarche, hormonal replacement therapy, ...

4. Life style related questions including exercise practices, nutrition, smoking, and others.

2.2 Target subjects

A total of 165 (96F and 69M) patients aged 25-75 years old, referrals to Jenin Hospital orthopedic clinic, representing the district during the period June 2001- June 2002 (see table 2.1) were randomly selected (one out of every three patients)

Table 2.1 Distribution of study population according to age and gender

No.	Age group	no. out of 165	Percentage	Males in group	Females in group
1	25 – 45	41	24.8 %	36 %	64 %
2	45 – 55	41	24.8 %	40 %	60 %
3	55 – 65	41	24.8 %	43 %	57 %
4	65 – 75	42	25.6 %	51 %	49 %

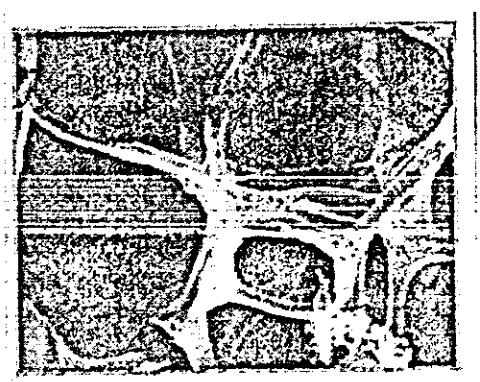
2.3 Data collection

The researcher had guided the C.B.R. workers (Community Based Rehabilitation) workers for filling the questionnaire lists with the target subjects. Patients were interviewed at the clinic and medical data were collected from their files.

2.4 Roentgenography

The different bone fractures and osteoporosis disease of bones were diagnosed from the roentgenogram of Roentgen-rays. Example of the histological structures of the normal and osteoporotic bone is shown in below.

X-Ray showing histological structure of the normal human bone



X-Ray showing histological structure of osteoporotic disease of human bone

2.5 Statistical analysis

Obtained data were analyzed using the statistical program SPSS (Statistical Package for Social Sciences). The percentages, frequencies and mean values were recorded.

CHAPTER III
RESULTS

Data presented in table 3.1 represent the overall findings among study population with respect to fracture sites. The most affected sites were related to the vertebral column. The percentages of 21.8, 16.4, 14.5, 10.9 and 12.7% were observed for vertebral, hip, wrist, ribs and other sites, respectively.

Table 3.1 Frequency and percentages of fracture types among study population

Fracture Site	No. (%)
Vertebral	44(21.8%)
Hip	35(16.4%)
Wrist	32(14.5%)
Ribs	26(10.9%)
Others	28(12.7%)
Total	165(100%)

Our observations regarding height loss among study population shows that there is a clear trend towards height loss with increased age. This is evident from the increased percentages among height groups < 155 (18.2%), 155-160 (21.8%), 161-166 (34.5%) which were represented by the following percentages respectively at age of 25, 10.9%, 16.4% and 27.3%. The other height groups 167 and more as expected showed decreased frequency rates as shown in table 3.2.

Table 3.2 Height variations of study population at age of 25 year and at time of study

Height Group /cm	No. (%) at 25 years	No. (%) at present
< 155	18 (10.9%)	30 (18.2%)
155-160	27 (16.4%)	36 (21.8%)
161-166	45 (27.3%)	57 (34.5%)
167-172	45 (27.3%)	24 (14.5%)
173-178	18 (10.9%)	09 (05.5%)
> 178	12 (7.3%)	09 (05.5%)
Total	165 (100%)	165(100%)

Data presented in table 3.3 shows the association between weight and osteoporosis reflected by fracture frequency among study population. Data regarding body weight of the study population, at 25 years of age and time of study, showed no significant difference in body weight between the various body weight groups. It was also found that the weight group 65-70Kg showed increased frequency.

Table 3.3 Weight of study population at age of 25 year and at time of study

Weight Group /kg	No. (%) at 25 years	No. (%) at present
<55	12 (7.3%)	3 (1.8%)
55-60	27 (16.4%)	27 (16.4%)
61-66	18 (10.9%)	24 (14.5%)
67-72	45 (27.3%)	54 (32.7%)
73-78	36 (21.8%)	09 (05.5%)
> 78	27 (16.4%)	48 (29.1%)
Total	165 (100%)	165(100%)

With respect to family history of osteoporosis, only 18% were reported to have family history of osteoporosis among first cousins relatives. Data presented in table 3.4 shows reported fractures among family members of affected individuals. The fracture percentages of 25.2, 16.4, 5.5, 10.9 and 14.5% were reported among mothers of affected individuals for vertebral, hip, ribs, wrist and other sites, respectively. The fracture percentages of 25.5, 14.5, 1.8 and 21.8% were reported among sisters of affected individuals for vertebral, hip, ribs and wrist, respectively. The fracture percentages of 14.5, 18.2, 1.8, 25.5 and 16.5% were reported among fathers of affected individuals for vertebral, hip, ribs, wrist and other sites, respectively. The fracture percentages of 9.1, 12.1, 27.7, 30.7 and 16.4% were reported among brothers of affected individuals for vertebral, hip, ribs, wrist and other sites, respectively. The findings on fracture sites in general indicates a more frequents vertebral fractures among females compared to males, however, this situation is reversed with respect of wrist fractures. No differences in frequency rates for other fractures sites related to gender.

Table 3.4 Frequency of fracture types among family members of population study

Fracture Site	Family Member											
	Mother			Sister			Father			Brother		
	Yes	No	Unknown	Yes	No	Unknown	Yes	No	Unknown	Yes	No	Unknown
	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)
Vertebral	42(25.2%)	87(52.7%)	36(21.8%)	36(25.5%)	81(56.4%)	26(18.2%)	24(14.5%)	120(72.7%)	21(12.7%)	13(9.1%)	99(72.7%)	25(18.2%)
Hip	27(16.4%)	123(74.5%)	15(9.1%)	21(14.5%)	106(74.5%)	16(10.9%)	30(18.2%)	117(70.9%)	18(10.9%)	20(12.1%)	109(66.1%)	8(4.8%)
Ribs	9(5.5%)	135(81.8%)	21(12.7%)	3(1.8%)	130(90.9%)	10(7.3%)	3(1.8%)	147(89.1%)	15(9.1%)	38(27.7%)	80(58.4%)	19(13.9%)
Wrist	18(10.9%)	126(76.4%)	21(12.7%)	32(21.8%)	98(69.1%)	13(9.1%)	42(25.5%)	114(69.1%)	9(5.5%)	42(30.7%)	82(59.8%)	13(9.5%)
Other	24(14.5%)	129(78.2%)	12(7.3%)				27(16.4%)	123(74.5%)	15(9.1%)	23(16.4%)	99(72.7%)	15(10.9%)

Table 3.5 Frequency of the various diseases observed among study population

Disease Occurrence	Disease								
	Hyper-thyroidism	Hypo-thyroidism	Hyperpara-thyroidism	Hypopara-thyroidism	Cushing Syndrome	Kidney Diseases	Mal-absorption	Chronic Rheumatic disease	Congenital Skeletal Diseases
	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)
Yes	6(3.6%)	00.00	3(1.8%)	9(5.5%)	12(7.3%)	36(21.8%)	21(12.7%)	42(25.5%)	9(5.5%)
N0	159 (96.4%)	165(100%)	162(98.2%)	156(94.5%)	153(92.7%)	129(78.2%)	144(87.3%)	123(74.5%)	156(94.5%)

Secondary osteoporosis is common and is reported to be associated with several diseases. Our findings in this regard showed that a limited number of our study population suffer from symptoms related to hormonal abnormalities related to thyroid and parathyroid glands (Table 3.5). This is evident from the findings of only 3.6% of the study population suffering from hyperthyroidism; none is suffering from hypothyroidism, 1.8% suffering from hyperparathyroidism and 5.5% suffering from hyperparathyroidism.

With respect to other systemic diseases, the most prominent disease was Chronic Rheumatic disease and represented by 25.5% followed by kidney disorders (21.8%), Malabasorption (12.7%), percentages of Cushing syndrome (7.3%) and congenital skeletal disorders (5.5%).

It is well known that late menarche and early menopausal ages are risk factors associated with osteoporosis. Findings of the current study on female physiological changes (table 3.6) shows that around 50% of the female study population were with apparently late onset of puberty (13 years and above), however, menopausal age seems to be within the normal range.

Table 3.6 Age at onset of puberty and menopausal age among females of study population

Age at puberty		Menopausal age	
Age/y	No. (%)	Age/y	No. (%)
10	03 (3.1%)	40-42	09(9.4%)
11	12 (12.5%)	43-45	24(25.0%)
12	24 (25.0%)	46-48	24(25.0%)
13	12 (12.5%)	49-51	15(15.6%)
14	15 (15.6%)	52-54	12(12.5%)
15	12 (12.5%)	<55	12(12.5%)
16	12 (12.5%)		
17	06 (6.3%)		
Total	96	Total	96

Other female related factors which might affect the health status of females suffering from fractures were also included in the study and included missing periods, pregnancy status, breast feeding and estrogen uptake were also studied. Our findings in this respect shows that 18.8% of the females included in the study experienced missing periods for at least 12 months, 9.4% were pregnant at the time of study, 6.3% breast feeding mothers and 25% were reported to use estrogen (table 3.7).

Table 3.7 Missing periods, pregnancy and breast feeding status and estrogen uptake among female group of study population

Status	Missing periods	Pregnancy Status	Breast feeding	Estrogen uptake
	No.(%)	No.(%)	No. (%)	No. (%)
Yes	**18(18.8%)**	09(9.4%)	06(6.3%)	24(25.0%)
No	**75(78.1%)**	87(90.6%)	90(93.7%)	69(71.9%)
Unknown	**03(3.1%)**	------	------	03(3.1%)
Total	**96(100%)**	**96(100%)**	**96(100%)**	**96(100%)**

Lack of physical activities impose a threat for development of osteoporosis and hence affect fracture rates. The findings of the current study clearly indicate lack of proper physical activities at various studied age intervals, especially with advanced ages (table 3.8).

Table 3.8 Physical activities (exercise) among study population

Physical activity status	Up to age of 25 years	25-52 years of age	<52 years of age
	No.(%)	No.(%)	No. (%)
No practice	**12(7.3%)**	**10(12.7%)**	**20(23.6%)**
> 3h/w	**24(14.5%)**	**16(18.2%)**	**26(30.3%)**
3h/w	**75(45.5%)**	**32(40.0%)**	**13(16.3%)**
Sportive	**54(32.7%)**	**24(29.1%)**	**24(29.6%)**
Total	**165(100%)**	**82(100%)**	**83(100%)**

Diary products are known for their rich contents of calcium and are considered as a major component of our daily diets. Calcium deficiency is a major risk factor for osteoporosis which is reflected on susceptibility to

fractures. Our results indicate that over 60% of the population study used milk and milk products in their diets 1-3 times per week. We also found the percentages of 18.2, 9.1 and 27.3% of the study population did not use hard cheese (Jebneh), soft cheese (laban and labaneh) and milk, respectively (table 3.9).

Table 3.9 Use of calcium rich diets among study population

Consumption Frequency/ week	Calcium Rich Food Diets/ No. (%)		
	Hard Cheese	Soft Cheese	Milk
1	42(25.5%)	49(29.1%)	30(18.2%)
2	36(21.8%)	33(20%)	39(23.6%)
3	24(14.5%)	30(18.2%)	21(12.7%)
4	15(9.1%)	21(12.7%)	15(9.1%)
5	9(5.5%)	9(5.5%)	6(3.6%)
6	6(3.6%)	3(1.8%)	6(3.6%)
7	3(1.8%)	6(3.6%)	3(1.8%)
None	30(18.2%)	15(9.1%)	45(27.3%)
Total	165(100%)	165(100%)	165(100%)

Data presented in table 3.10 shows frequency of milk consumption among study population. Our findings strongly indicate that milk consumption is below the internationally recommended levels (300ml/day), as around 73% of the study population reported a consumption of 150ml or less at the age of less than 25 years. It was also found that 49% and 60% of them reported a consumption of 150ml or less

at the age of 25-50 and > 55 years of age (table 3.10). It is also clear that less milk was consumed with increasing age.

Table 3.10 Milk consumption by study population at various age intervals

Consumed amounts	Daily Milk Consumption		
	Age < 25	25-50 /y	> 50 /y
300 ml / day	12(7.3%)	9(10.9%)	5(5.5%)
150 ml /day	33(20%)	33(40%)	28(34.5%)
150 ml/ week	42(25.5%)	15(18.2%)	23(27.3%)
>150ml/ week	75(45.5%)	25(30.9%)	27(32.7%)
None	3(1.8%)	--------	------
Total	165(100%)	82(100%)	83(100%)

The findings on other related health factors including smoking status, alcohol use and soft drinks showed that 36.4% of the study population were smokers, 3.6% were reported to use alcohol, around 50% consume 400ml or less of tea, around 27% drink around 40ml of coffee per day and 29.1% were reported to drink around 150ml of cold soft drinks.

With respect to health feelings and capability to handle daily life activities, only 3.6% were reported to have a sick feeling and were unable to handle their daily life activities. It was also found that around 26% of them were reported to feel tiered all times. The rest of them were reported to feel healthy.

CHAPTER IV
DISCUSSION

Osteoporosis is a major cause of illness and death in the elder and characterized by low bone mass leading to an increased risk of fracture particularly of the spine, hip and wrist (John A., 1996). In Palestine no previous studies were carried out on the status of the disease nor associated risk factors. The current study aimed at evaluating the status of the disease and search for possible risk factors among the inhabitance of Jenin district in the northern part of Palestine.

Our findings regarding the frequency of fractures at the various sites among the study population showed the spinal (21.8%), hip (16.4%) and wrist 14.5% were the most commonly frequent sites (table 3.1). This finding is in agreement with previous reports where spin, hip and wrist were in particular the most common fracture sites (John A., 1996; Composten E. and Clifford J., 1999; Cooper C., Compsten E.G., Melton, L.J., 1992). It is also well documented that vertebral fracture highly doubled the risk of another spinal fracture and hip fractures are often representing symptom of age-related osteoporosis. Other bones like proximal humeral, pelvic, distal tibia and ribs are also susceptible to osteoporosis fracture.

Our findings with respect to height loss (trabiculated bone) among study population clearly shows a trend towards shortening with increased age as a noticeable increase in the frequency of those among the height groups 161-166 and less with increased age was observed. On the other

hand a decrease frequency in the height of those 167 or more was observed (table 3.2). The more likely explanation for this is spinal compression. Our findings are in agreement with the findings of Ma'lof G., 2002 who reported that Lebanese males became shorter after the age of 35-40 years and the European males became shorter later after the age of 40.

Loss of weight is also seems to be associated with osteoporosis and this is mainly due to loss of bone mass after fracture and with increased age. In our population weight loss was observed among the weight group 73-78kg (21.8% at age 25; 5.5% at time of study). Generally speaking no clear weight loss was observed among other weight groups (see table 3.3).

Family history of bone fractures among the family members (sibs and parents) of study populations strongly indicates that a relatively high frequency of bone fractures were observed among family members (see table 3.4), which indicates the involvement of genetic factors in osteoporosis occurrence. This finding is consistent with the studies of (Pacific I., 1996; National Osteoporosis Foundation, 1998) in which family history of osteoporosis disease is considered as a significant factor for bone mass formation as it appears that around 80% of bone mass is determined by genetic factors (Karl O., 1997). An interesting finding in our population was the occurrence of more spine and hip fractures among females compared to males, while the situation is reversed concerning wrist. Our findings in this respect were in agreement with reports on the

high incidence of spine and hip fractures in females (Cooper C., Compsten E.,G. Melton, L.J., 1992; Karl O., 1997). It is also important to note that daughters of mothers with osteoporosis exhibit lower bone mass than aged-matched daughters of mothers without osteoporosis (Karl O., 1997). Further studies are required to reveal the reason behind such observation. Fractures among second cousin relatives of the study population were also observed which again emphasizes the role of genetic factors in development of osteoporosis.

Secondary osteoporosis may develop under the influence of nutritional, hormonal, hereditary, rheumatological disease, hematological disease and drugs. Secondary osteoporosis was also considered in the present study. The effects of many diseases or syndromes are documented in (table 3.5). In our study population the majority of those with fractures were reported to suffer from rheumatological disease (25.5%) as well as kidney related diseases (21.8%). Such finding is also in agreement with previous reports (Karl O., 1997). Hormonal complications were represented with a very small percentage in our study population. In general one can conclude that the majority of the enrolled patients were not suffering from secondary osteoporosis which is known to contribute significantly in the acceleration of bone loss. Such finding is consistent with that of (Harper K.D., Weber T.J., 1998).

The effects of physiological changes on the female bone mass were also considered in the present study (table 3.6). Late menarche and early menopausal onset is considered as a risk factor for osteoporosis. In our female study population around 40% were reported to have an early menarche 12 years or less. It is expected that this group is at high risk of osteoporosis because of both impaired acquisition of peak bone mass and accelerated bone loss (American College of Rheumatology Task Force on Osteoporosis Guidelines., 1996). On the other hand early menopausal age was reported among 34.4% of female study population (45 or less). This situation imposes a threat and a risk of osteoporosis among this group. During menopause, estrogen deprivation enhances the rate of bone dissolution, although bone formation is accelerated in an attempt to match this increased rate of resorption and the net is loss of bone.

Other female related factors (missing periods, breast feeding, pregnancy, and estrogen uptake) were studied. The finding of 18.8% of the female population with missing period is an indication of hormonal imbalance and mainly is concerned with estrogen. Thus, this group will be also at risk of osteoporosis as discussed earlier about the role of estrogen. Pregnancy status, number of bore children, breast feeding are also risk factors of osteoporosis for married women. It is of great importance to note that around 60% of reported fracture cases were among women.

This finding is in agreement with reports from the USA that fractures among females were more common compared to males (McGarry K.A., Kiel D.P., 2000). Physiological variations in both genders may account for this discrepancy in prevalence rates of fractures in both sexes.

Physical activities are expected to increase activity of bone marrow and hence increases and build bone mass and strength (Chow R., Harrison J.E., Notarius C., 1987; Leigig G., Helmut W.M., Sauer P., Wuster C., Wuster J., Wuster J., Lojen M., *et al.,* 1990). Studies by (Cummings S.R., Kelsey J.I., Nevitt Mc., 1985) suggested that physical activities protect against hip fracture in older women by improving muscle strength, balance, mobility and overall physical functions. It was also reported that osteoblasts are sensitive to mechanical stress, the skeleton needs continuous physical stimulation, otherwise, bone loss ensues. Our findings with respect to practice of physical activities indicate lack of proper activities among study population. Such situation increase risk of osteoporosis among our population.

Recommended daily calcium intake is 1200 to 1500 mg. for the postmenopausal woman and 1000mg/day for normal individuals (Tilyard M.W., Spears G.F., Thomson J., Dovey S., 1992). Combined calcium and vitamin D supplementation have

been shown to decrease the risk of fractures and increase total body bone marrow mineral density in elderly men and women (Reid I.R., Ames R.W., Evans M.C., et al., 1995; Dawson-Hughes B., Harris S.S., Krall E.A., *et al.,* 1998). It is also well documented that low calcium intake is associated with accelerating bone loss (Reid I.R., Ames R.W., Evans M.C., *et al.,* 1995).

Although, milk and diary products are considered as major commodities in our diets, the findings of our study indicates limited use of such nutrients. This is evident from the findings of 18.2%, 9.1% and 27.3% of the study population who were reported not feeding on hard cheese, soft cheese and milk, respectively (table 3.9). For those who use such commodities, it was found that their use is very limited and below body requirements especially with respect of calcium (Tilyard M.W., Spears G.F., Thomson J., Dovey S., 1992).

Milk intake by adolescents has been shown to improve bone mineralization (Karl O., 1997). Calcium alone may be insufficient to combat osteoporosis, but other nutrients, besides calcium, are essential for bone health. Adolescents must maintain dietary balance including, mainly, proteins, other caloric sources, phosphorus and calcium.

With respect to milk intake in our population study (table 3.10), one can easily deduce, looking at daily milk consumption for the age group less than 25 years, that milk intake is very limited at this critical stage of the life of human beings. Such finding strongly indicates that absence of balanced diets was a risk factor among our study population for development of osteoporosis. Improper milk intake by other age groups was also observed.

The current study also included several other factors that are either directly or indirectly involved as a risk factor of osteoporosis. The smoking status of the study population showed that 36.4% were smokers. Both hormonal imbalance and smoking were reported to cause early menopausal onset, thus one should think of smoking being a risk factor in our population (Maya Khori, 2002; Pocock N.A., Eisman J.A., Kelly P.J., *et al.,* 1989). Alcohol usage was very limited in our study population and this is an expected observation as alcohol is not socially as well as from religious point of view acceptable. Studies by (Pocock NA, Eisman J.A., Kelly P.J., *et al.,* 1989) indicates that alcohol can inhibit the proliferation of osteoclasts, thereby impairing bone formation. Soft drinks are known for their effects on the absorption of minerals by the gut. Studies by (Pocock NA, Eisman J.A., Kelly P.J., *et al.,* 1989) shows that caffeine intake

inhibits calcium absorption from the intestine especially at the postmenopausal period in women. This is expected to affect availability of required bone mineralization, which will affect both bone density as well as its strength.

Recommendations and concluding remarks

The following recommendations may be very necessary to follow in order to avoid the risk of bones fracture caused by low bone density which is related to the osteoporosis disease. Prevention measures are always the first step in therapy.

It might be of some interest to recommend the followings:

1- It is of great importance that the Ministry of Health and other non-governmental health related bodies to pay more attention to the problem of osteoporosis and this can be achieved through identification of families at risk and designing of special educational programs for this group.

2- Follow up of affected patients through special health care programs that ensure good treatment and education related to osteoporosis.

3- More care and attention should be targeted towards women approaching menopausal age with respect of preventive measures of developing osteoporosis e.g., estrogen hormone therapy...

4- Educational programs to bring more attention to this problem are required and this can be done through the Ministry of Education.

5- The Ministry of Health should find a way to identify cases with osteoporosis and plan follow up and treatment strategies for this group as this will be less costly on the long run.

6- Recommending bone mineral density to all women of 65 years old and older regardless of additional risk factors.

7- Advising all patients to obtain an adequate dietary intake of calcium (at least 1,200 mg per day), including supplements if necessary.

8- Recommending regular weight – bearing and muscle – strengthening exercise to reduce the risk of falls and fractures.

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بسم الله الرحمن الرحيم

يقوم أحد طلاب الدراسات العليا "الماجستر" في برنامج الصحة العامة في جامعة النجاح الوطنية بعمل دراسة حول مرض هشاشة العظام في محافظة جنين، ولهذا نرجوا منكم المساعده والإجابة على الاسئلة بكل جدية ولكم جزيل الشكر.

1- معلومات عامة :

مكان الاقامة : ☐ قرية ☐ مدينة ☐ مخيم

الجلس : ☐ ذكر ☐ انثى

العمر : .....

الوضع الاقتصادي : ☐ عالي ☐ متوسط ☐ منخفض

ب- معلومات طبية :

1- *كم كان طولك عندما كان عمرك 25 سنة ؟*

1- ..... 2- لا اعلم

2- *كم يبلغ طولك الان ؟* .....

3- *كم كان وزنك عندما كان عمرك 25 عاما ؟*

1- ..... 2- لا اعلم

4- *كم يبلغ وزنك الان ؟* .....

5- *هل سبق و أن عانى أي من الأقارب من افراد العائله من اي مشاكل في هشاشة العظام؟*

☐ نعم ☐ لا ☐ لا اعلم

6- *هل كانت امك تعاني من اي من الكسور أو الام العظام التاليه عندما كان عمرها 45 سنة ؟*

ا- فقرات الظهر :	☐ نعم	☐ لا	☐ لا اعلم
ب- عظم الورك :	☐ نعم	☐ لا	☐ لا اعلم
ج- عظم القفص الصدري :	☐ نعم	☐ لا	☐ لا اعلم
د- عظام الذراع :	☐ نعم	☐ لا	☐ لا اعلم
ه- غير ذلك :	☐ نعم	☐ لا	☐ لا اعلم

- هل كانت تعاني اختك من اي من الكسور العظام التالية :

ا- فقرات الظهر :	☐ نعم	☐ لا	☐ لا اعلم
ب- عظم الورك :	☐ نعم	☐ لا	☐ لا اعلم
ج- عظم القفص الصدري :	☐ نعم	☐ لا	☐ لا اعلم
د- عظام الذراع :	☐ نعم	☐ لا	☐ لا اعلم
ه- غير ذلك :	☐ نعم	☐ لا	☐ لا اعلم

و- ليس لي اخوات

- هل كان ابوك يعاني من اي من الكسور العظام التالية عندما كان عمره 45 سنة ؟

ا- فقرات الظهر :	☐ نعم	☐ لا	☐ لا اعلم
ب- عظم الورك :	☐ نعم	☐ لا	☐ لا اعلم
ج- عظم القفص الصدري :	☐ نعم	☐ لا	☐ لا اعلم
د- عظام الذراع :	☐ نعم	☐ لا	☐ لا اعلم
ه- غير ذلك :	☐ نعم	☐ لا	☐ لا اعلم

- هل كان أخوك يعاني من اي من الكسور العظام التالية ؟

ا- فقرات الظهر :	☐ نعم	☐ لا	☐ لا اعلم
ب- عظم الورك :	☐ نعم	☐ لا	☐ لا اعلم
ج- عظم القفص الصدري :	☐ نعم	☐ لا	☐ لا اعلم
د- عظام الذراع :	☐ نعم	☐ لا	☐ لا اعلم
ه- غير ذلك :	☐ نعم	☐ لا	☐ لا اعلم

7- *هل تعرضت للنوم في الفراش بشكل متواصل لفترة تجاوزت الشهرين ؟*
☐نعم ☐ لا ☐ لا اعلم

- اذا كان الجواب نعم :
☐ قبل سن 25 ☐ بعد 25 وكان ليس في السنة الماضية
☐ السنةالماضية ☐ لا اعلم

7- هل استخدمت عقار " الكورتيزون " سواء كان على شكل ابر او حبوب لفترة تزيد عن 3 اشهر
☐ نعم ☐ لا ☐ لا اعلم

ج- اسئلة خاصة بالاناث :

8- *كم كان عمرك عندما بدأت لديك الدورة الشهرية ؟* .....

9- *كم كان عمرك عندما انتهت لديك الدورة الشهرية ؟*.....

10- *هل فقدت الدورة الشهرية اكثر من 12 شهر لاسباب ليس لها لعاقة بالحمل او انقطاع الطمث الدائم ؟*
☐ نعم ☐ لا ☐ لا اعلم

11- *هل انت حامل ؟*
☐ نعم ☐ لا ☐ لا اعلم

12- *هل انت مرضعة ؟*
☐ نعم ☐ لا
اذا كان الجواب نعم ، كم طفلا ارضعت لفترة تجاوزت الثلاثة اشهر ؟ .....اطفال

13- *هل حدث وان اخذت الهرمون الانثوي خلال او بعد الدورة الشهرية ؟*
☐ نعم ☐ لا ☐ لا اعلم

د- طبيعة الحياة :

14- *هل تمارس" الرياضة " المشي ركوب الدراجة ، كرة السلة ، التنس ....."خلال :*

أقل من 25:	☐ لا	☐ قليل	☐ 3 ساعات لكل اسبوع	☐ رياضي
الفترة بين 25 و52	☐ لا	☐ قليل	☐ 3 ساعات لكل اسبوع	☐ رياضي
غير ذلك : :	☐ لا	☐ قليل	☐ 3 ساعات لكل اسبوع	☐ رياضي

15- *كم تمضي من الوقت في المشي او ركوب الدراجة خارج البيت كل يوم ؟*
☐ لا ☐ احيانا ولكن اقل من نصف ساعة ☐ نصف ساعة ☐ اكثر من ساعة

16-*ما هي طبيعة عملك ؟*
☐ مكتبي ☐يتطلب حركه مثل مزارع ☐ غير ذلك

17- *هل اكلت خلال ايام الاسبوع الماضي من الوجبات التالية التي تحوي عنصر الحليب :*
الجبنة المالحة.....ايام في الاسبوع
الجبنة الحلوة ..... ايام في لااسبوع
الحليب ..... ايام في لااسبوع
غير ذلك " مثل البوظة " ..... ايام في لااسبوع

18- *خلال الفترات العمرية التالية : حدد كمية الحليب التي كنت تناولها في تلك الفترة :*
1- عندما كنت شابا فوق 25 عاما شربت الحليب
☐ ثالثة كؤوس او اكثر يوميا ☐ كل يوم بكمية تراوح بين 1-2 كاس في اليوم
☐ كل اسبوع وليس كل يوم ☐ اقل من مرة في الاسبوع
2- عندما كان عمرك بين 25 و50 :شربت الحليب :
☐ ثالثة كؤوس او اكثر يوميا ☐ كل يوم بكمية تراوح بين 1-2 كاس في اليوم
☐ كل اسبوع وليس كل يوم ☐ اقل من مرة في الاسبوع
3- عندما كان عمري فوق 50 عاما شربت الحليب :
☐ ثالثة كؤوس او اكثر يوميا ☐ كل يوم بكمية تراوح بين 1-2 كاس في اليوم
☐ كل اسبوع وليس كل يوم ☐ اقل من مرة في الاسبوع

19- هل انت مدخن ؟ ☐ كنت مدخنا والان لا ☐ لست مدخنا

☐ نعم الان

20- اذا كنت مدخنا منتظما :

كم كان عمرك عندما بدأت بالتدخين ؟.....

كم عدد السجائر التي تدخنها في اليوم او كنت تدخلها عندما كنت مدخنا ؟.....

اذا توقفت عن التدخين، كم كان عمرك عندما اقلعت عنه ؟.....

21- هل تتناول الكحول ؟

☐ نعم ☐ لا

22- فيما يتعلق بالمشروبات التي تحتوي مادة " الكافايين " شاي قهوة مشروبات غازية (تمكافيه او ما شابه ذلك" كم كاس من هذه المشروبات تتناول يوميا؟

قهوة .....شاي .....مشروبات غازية .....مشروبات باردة.....

23- كيف تصف وضعك الصحي في هذه الفترة ؟

☐ جيد جدا ☐ جيد ☐ مقبول ☐ ليس على ما يرام ☐ سيئ

د- هل تعاني من احد الامراض التالية :

- تضخم في الغدة الدرقية : ☐ نعم ☐ لا

- ضمور في الغدة الدرقية : ☐ نعم ☐ لا

- تضخم في الغدة جار الدرقية : ☐ نعم ☐ لا

- مرض الغدة فوق الكلوية: ☐ نعم ☐ لا

امراض الكلى: ☐ نعم ☐ لا

امراض مزمنة: ☐ نعم ☐ لا

سوء الامتصاص : ☐ نعم ☐ لا

امراض مزمنة في المفاصل: ☐ نعم ☐ لا

امراض خلقية في الهيكل العظمي : ☐ نعم ☐ الحوض ☐ الرسغ ☐ القفص الصدري

كسر سابق في : ☐ فقرات الظهر

☐ غير ذلك

مع تحيات الطالبة اسلام الصباوي