

# Osteoporosis: demographic factors

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Osteoporosis: Demographic Factors INTRODUCTION In human body, osteoblasts and osteoclasts play a crucial role in bone development. In specific, bone formation is supported by osteoblasts and old bones are replaced by osteoclasts. However, it is observed that a number of older men and particularly, women are suffering from one of the most distressing diseases, Osteoporosis that results in malfunction of these two cells in later stages of life. In the United Kingdom, osteoporosis has affected more than seven million people; while ten millions have become victims of osteoporosis disorder in the United States. World Health Organization stated that every third women above forty years of age in the United Kingdom is suffering from osteoporosis. (WHO, 2003) Now the essay will discuss some symptoms and accepted definitions of Osteoporosis.

#### DEFINITION & SYMPTOMS

Fractures can easily developed in bones that are affected by osteoporosis. Some of the experts have noted that a reduction is observed in the bone mineral density that causes osteoporosis due to disruption in bone framework and alteration in different variety of proteins and collagens. (Nelson, 2006) In terms of definition, “ bone mineral density 2. 5 standard deviations below peak bone mass as measured by DXA, includes the presence of a fragility fracture is termed as ‘ Osteoporosis’.” In other words, development of porous and spongy bone is the result of osteoporosis. (Hughes, 207) Besides all these symptoms and definitions, experts have specified that age factor is the major connection in osteoporosis that increases the effect of other risk factors associated with osteoporosis. In this regard, risk factors discussed in following sections of the essay are unique and distinct in properties; however, all are related with age factor.

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## DEMOGRAPHIC FACTORS

Experts (WHO, 2003) have specified that number of older people suffering from osteoporosis will continue to increase with increment in world population. In specific, eighty percent of abovementioned sufferers are women, and particularly women older than fifty years of age. Besides different risk factors, ethnicity plays a significant role in the development of osteoporosis. Although people of all ethnic backgrounds confront significant risks; however, it is noted that White and Asian racial groups are at greater risks, as compared with other racial backgrounds. (Meunier, 1998) Besides Asian and White people, twenty percent of non-Hispanic Caucasian women above fifty years of age confront osteoporosis annually. On the other hand, eight percent of non-Hispanic Caucasian men above fifty years of age confront the same disorder as well. (Newman, 2007)

Furthermore, six percent of non-Hispanic Black women suffer from osteoporosis, followed by four percent of men from non-Hispanic Black racial background confronting the same disease. African-American women are also catching osteoporosis, which is increasing at an alarming rate.

Approximately, ten percent of African-American women above fifty years of age suffer, while three percent of men confront the same. (Newman, 2007)

After detailed analysis and comparison, Hispanic women are at greater risk, as compared with other ethnic groups. Experts predicted that cost for the treatment of fractures and breakages related to osteoporosis and low bone mass will reach to two billion dollars in the year 2025. (Marcus, 2008)

## AIMS

Examination of relationship between Osteoporosis and Ageing Factor in Humans

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## OBJECTIVES

Effective Understanding of Osteoporosis and its Impact in different Demographic regions

Analysis of Hormonal, Genetic, and Environmental Factors with their Relevance with Ageing Factor

Identification and Evaluation of Evidence related to Osteoporosis

## RISK FACTORS

Medical experts have identified and associated a number of risk factors with osteoporosis; however, individual practices play a significant role in the development of osteoporosis.

## HORMONAL FACTORS

### Hyperthyroidism

Bone metabolism plays a crucial role in the occurrence of osteoporosis in humans. In this regard, it is observed that increment in bone reabsorption results in osteoporosis, which is caused by excessive increment in thyroid hormones that are related with the movements of osteoclasts, as well as, osteoblasts in later stages of human life. (Kessler, 2000) In this regard, studies are being carried out and it is noted that treatment of thyroid hormone disorders has shown reduction in bone fractures. However, it should be noted that this factor is related with age as well, as such occurrences are observed in later stages of life.

### Sex hormones

In addition, when women confront osteoporosis after their menopause/s, it is termed as ' Postmenopausal Osteoporosis'. (Amonkar, 2002) On the other hand, hormonal disorders along with chronic diseases due to intense medications also play a crucial role in the development of osteoporosis.

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(Miller, 2007) In specific, women confront faster bone loss, as compared with men, due to their menopause that is considered one of the major risk factors associated with disease of osteoporosis. (Nelson, 2006) It is noted that osteoporosis can develop due to low levels of estrogen and testosterone in women and men respectively, which can be prevented after medical advices. (Daniels, 2004) In women, estrogen levels fall down during the menstrual period, which is termed as Amenorrhea. In addition, extreme energetic training and exercise, especially in sports increases chances of development of Amenorrhea, and thus, osteoporosis. However, it is likely that such hormonal changes would be confronted in older age, as compared to early period that does not cause osteoporosis. (Amonkar, 2002)

Experts noted that bone density can be maintained effectively by estrogens that play an imperative role in such process. In this regard, a number of experts have related deficiencies of estrogens to the occurrence of osteoporosis, as such deficiency often results in various bone fractures in menopausal women. In the year 2003, experts notified that a majority of women are now going for hormone therapy that plays a crucial role in treating osteoporosis. In this regard, it is noted that phytoestrogens are very beneficial for menopausal women due to its natural benefits. (Nelson, 2006) In specific, one of the natural forms of estrogen is phytoestrogens that help menopausal women in the prevention and treatment of osteoporosis. In addition, a number of studies have related consumption of estrogens in the human body with bone health in menopausal women.

## GENETIC FACTORS

### VDR

In the United States, recent researchers indicated that vitamin D receptor, <https://assignbuster.com/osteoporosis-demographic-factors/>

also known as VDR plays an imperative role in bone mineral density. (Marcus, 2008) One of the major components in this association is polymorphisms of VDR whose length when restricted results in higher rate of bone loss in the human body, and thus, promotes occurrence of osteoporosis. In another study, relationship of polymorphisms of VDR gene was evaluated with rate of bone loss for a 4-year period, and it was observed that VDR had an impact on rate of bone loss along with other factors of dietary habits. (Marcus, 2008) Still, recent researchers are endeavoring to prove such relation, but, it is still imperative that comprehensive research should be carried to confirm such relation of VDR and osteoporosis.

#### Gender

As earlier discussed in the essay, gender is one of the major risk factors that increase the chances of development of osteoporosis, as studies have indicated that women in older ages are more likely to suffer from osteoporosis, as compared to men that are unlikely to confront such disorder. (Demay, 2008) One of the main causes of developing osteoporosis in women is less bone tissues due to chronic alterations during menopausal changes. (Marcus, 2008) In addition, they suffer from greater bone loss as well due to the abovementioned reason in later stages of life. In women, maintenance of bone density is an important process that is done effectively by estrogens. However, menopause results in rapid reduction of estrogen levels that accelerates the process of bone loss in older women. (Jennings, 2001) Experts have specified that older women face approximately four percent of bone density loss annually until ten years after menopausal duration. Some cases have reported loss of more than thirty percent of bone density due to osteoporosis. (Brown, 2000)

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## Aging and Telomere

The most imperative risk factor that cannot be avoided by experts is age factor, which plays a crucial role in the development of osteoporosis.

Scientific studies have noted that osteoporosis is likely to develop in older people, and more likely the one becomes older. It is specified that bones become weaker, as well as, thinner during later stages of life, which cause osteoporosis. (Siris, 2003) In addition, combination of old age and menopausal effects put women at the greatest risk of developing osteoporosis. (Hirschhorn, 2008) One of the most imperative causes of confronting osteoporosis in older people is that older people suffer from shortened telomeres, which is a genetic risk factor associated with the selected disease. In cultured human cells, cellular replicative agedness results in shortening of telomeres. In specific, telomere can be observed at the end of chromosomes that is responsible for protection of abovementioned end, in case of any destructive elements. (Meunier, 1998) (Hornsby, 2006)

Abovementioned graph explain the comparison of older men and women with their relation with bone mass density and period when they reach fracture zone. In addition, a region of repetitive DNA in chromosomes is known as telomere, which plays an important role during the division of human cells by replicating the DNA. (Gaby, 1995) In this regard, studies have indicated that aging of bone usually results due to the shortening of telomere that occurs, as the person gets older, which is one of the major factors of association of telomere with osteoporosis. (Hornsby, 2006) Some of the other studies have associated length of telomere with bone mineral and mass density, which gets affected by their shortening as age increases. <https://assignbuster.com/osteoporosis-demographic-factors/>

Some experts have noted that length of telomere can be considered as an indicator of bone aging. (Gisselsson, 2004) In this regard, when telomeres shorten, bone ages, and thus, results in osteoporosis. In African-American region, a study was carried out by the World Health Organization (WHO, 2003) that provided results linking shortening of telomeres with bone aging, which results in weakening of bones, and therefore, osteoporosis. (Hornsby, 2006) Although a number of researches have been carried out to understand, identify, and analyze the association of shortened telomeres with osteoporosis, further research is needed to acquire concrete evidence related to shortening of telomere and occurring osteoporosis.

#### Celiac Disease

Another inherited genetic disorder that is associated with gluten intolerance. In specific, lining of the small intestine damages by immune systems of people confronting Celiac disease in later stage of their lives. On the other hand, small intestine plays an imperative role for absorption of nutrients required for proper functioning of the human body, and attacking on small intestine increases the chances of getting osteoporosis. (Orwoll, 2003)

#### Osteogenesis Imperfecta

One of the unavoidable genetic disorders that cause bone fractures and breakages is Osteogenesis Imperfecta. (Lane, 2001) As the term says, bones and muscles of people confronting this genetic disorder are more likely to have weaken and loose muscles and joints, spine curvature, and irregularity of long bones. Such genetic disorder worsens as the age increases. Bones in affected people are not developed appropriately during earlier stages of life, and thus, it results in greater risks of suffering from osteoporosis in older stages. (Lane, 2001)

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## Ethnicity

Another unavoidable environmental risk factor in any case, which has been associated with osteoporosis, is Ethnicity. (Hughes, 2007) As earlier mentioned in the essay, older Caucasian and Asian women are the major victims of this disorder. Studies have considered African-American, as well as, Hispanic women as predicted sufferers; however, they confront lower risks, as compared with former ones. (Kessler, 2000) In addition, it is possible that a hip fracture in African-American women will result in death; however, White women are less likely to die due to such fracture. Another cause of higher prevalence of osteoporosis in African-American women is greater occurrence of some other diseases, such as sickle cell anemia, lupus, and huntington disease in African-American population, as compared with other ethnic population that are less likely to confront such diseases. (Kessler, 2000)

In other words, risks of developing osteoporosis increases due to such prevalence. Moreover, the Recommended Dietary Allowance specifies a standard consumption of calcium; however, African-American older women are not able to consume even fifty percent of required calcium, which results in frequent bone loss and incapacity to prevent such loss. (Fordham, 2004) As earlier mentioned, calcium plays a pivotal role in the development of bone density, which slows down due to inadequate supply of calcium to the body in older people. Lactose intolerance is one of the other causes that put African-American population at greater risk of getting osteoporosis. Experts (Allain, 2004) noted that calcium intake is obstructed by intolerance of lactose in older life period, which plays a vital role in process of bone density. Furthermore, ethnicity plays a crucial role; however, age factor does play an

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imperative role in occurrence of osteoporosis in abovementioned ethnic nations.

#### ENVIRONMENTAL FACTORS

Studies have indicated that consumption of carbonated beverages and processed foods during early stages of life plays a crucial role in the development of abovementioned disease in later stages of life. (Jennings, 2001) Healthy lifestyle is very significant for every person, as it decides the level of suffering and pleasure in later period of life; however, it is never late to change your practices, in order to avoid any risk factors associated with the disease. In this regard, body for effective building of bones should acquire proper nutrients and natural food in a stronger manner. (OA, 2009)

#### Anorexia nervosa

Another avoidable and treatable risk factor associated with selected disease is anorexia nervosa that is a state of low body fat in older women, which can result in increment of osteoporosis related chances. As discussed, Anorexia nervosa is an environmental risk factor that may result in osteoporosis in women, but is related to age factor specifically. It is observed that a number of older women confront fear of gaining weight that is mostly unreasonable and psychological, which increases the chances of getting osteoporosis.

(Arden, 2006)

#### Alcohol intake

A majority of scientific studies have specified that bone loss and fractures increase with increment in extreme consumption of alcohol, as well as, increment in age. (Miller, 2007) In specific, maintenance of balance of calcium is very important for proper bone formation, which is interfered by inappropriate alcohol intake, and results in worsening of such maintenance

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in older stages. (Alexander, 2006) In addition, parathyroid hormone levels increase as well that result in the reduction of reserves of calcium in human body. In this regard, older men and women both confront heavy risks due to extreme alcohol intake, as it results in deficiency in hormone levels. (Marcus, 2008)

### Breast Cancer

For several reasons, risks of getting osteoporosis have increased in women suffering from breast cancer. As earlier mentioned, estrogen levels play a significant role in the formation of bone density; (Adams, 1999) however; estrogen levels are decreased during chemotherapy sessions with loss of ovarian function that disrupts hormone levels in the older body. (Notelovitz, 2003)

### CONCLUSION

Conclusively, osteoporosis has become one of the devastating diseases that have deteriorated lives of millions of people in different parts of the globe, specifically, people with old ages. In other words, chances of confronting osteoporosis increase by every year passed in the life. In this regard, women are the major victims of osteoporosis due to their quick bone resorption, and in some cases, gradual bone replacement in the body in later stages of life.

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