Assessment of Health Follow up and Weight Control for Women with Osteoporosis in Baqubah City

تقييم المتابعة الصحية والسيطرة على الوزن للنساء المصابات بهشاشة العظام في مدينة بعقوبة

Manal Y. Mohammed, MscN*

Hala S. Abdulwahed, PhD**

***Academic Nurse, Ministry of Health, Diyala Health Directorate, Baladroze General Hospital, Iraq.**

E:mail: manal.younies9512@gmail.com .

****Professor, Community Health Nursing Department, College of Nursing, University of Baghdad, Iraq. E:mail: hala_63@conursing.uobaghdad.edu.iq**

المستخلص

الاهداف: تقييم المتابعة الصحية والسيطرة على الوزن للنساء المصابات بهشاشة العظام ومعرفة العلاقة بين متابعتهم الصحية والسيطرة على وزنهم وعلاقيتها بخصائصهن الاجتماعية -الديموغرافية.

منهجية البحث: أجريت دراسة وصفية على النساء المصابات بهشاشة العظام للفترة من 26 أيلول 2020 إلى 20 حزيران 2021. عينة غير احتمالية (ملائمة) من (70) امرأة مصابة بهشاشة العظام تم اختيارها من (5) عيادات خاصة للمفاصل والكسور في بعقوبة مدينة. تم تصميم الاستبيان من خلال مراجعة شاملة للأدبيات ويتكون من ثلاثة أجزاء: الجزء الأول يتضمن الخصائص الديموغرافية الاجتماعية للمرأة ، والجزء الثاني يتضمن عناصر عن متابعة صحة المرأة ، والجزء الثالث يتضمن عناصر عن التحكم في وزن المرأة. تم استخدام تقنية المقابلة لجمع البيانات. تم تحديد مصداقية الاستبيان وصدقه من خلال دراسة تجريبية ولجنة مكونة من (9) خبراء. تم تحليل البيانات من خلال استخدام طرق التحليل الإحصائي الوصفي والاستنتاجي.

النتائج : بينت نتائج الدراسة أن غالبية أفراد عينة الدراسة من ضمن الفئة العمرية (40-49) سنة ، متزوجات وربات بيوت ، ذوات تعليم متدني ، ذوات دخل شهري اسري منخفض ، ويعيشون في الريف. معظم هؤلاء النساء بين المستوى العادل والمستوى الجيد من المتابعة الصحية ومستوى عادل من التحكم في الوزن.

الاستنتاج: خلصت الدراسة إلى أن النساء المصابات بهشاشة العظام بحاجة إلى مزيد من الالتزام بالمتابعة الصحية والتحكم في الوزن. العمر هو السمة الوحيدة للخصائص الديموغرافية للمرأة التي لها علاقة بمتابعتها الصحية والتحكم في الوزن.

التوصيات: أوصت الدراسة بإجراء برامج التثقيف الصحي حول التحكم في الوزن لتقديمها للنساء المصابات بهشاشة العظام ، ويمكن أن تلعب وسائل الإعلام دورًا أساسيًا في زيادة وعي المرأة بالمتابعة الصحية والتحكم في الوزن.

الكلمات المفتاحية: التقييم، المتابعة الصحية، السيطرة على الوزن، هشاشة العظام، النساء.

Abstract

Objective(s): assessment of the health follow up and weight control for women with osteoporosis and find out the relationship between their health follow up and weight control and their socio-demographic characteristics.

Methodology: A descriptive study was conducted on women with osteoporosis for the period of September, 26th 2020 to Jun, 20th 2021. Non- probability (convenient) sample of (70) women with osteoporosis selected from (5) Private Clinics for Joints and Fractures in Baqubah City. A questionnaire was designed though extensive review of literatures and it consists of three parts: the first part includes women's socio demographic characteristics, the second part includes items on women's health follow up , and the third part includes items on women's weight control. Interview technique was used for data collection. The reliability and validity of the questionnaire was determined through a pilot study and a panel of (9) experts. The data was analyzed through the use of descriptive and inferential statistical analysis approaches.

Results: The results of the study show that the majority of the study sample are within the age group of (40-49) years , married and housewives, low educated, with low family monthly income, and living in the rural area. most of these women are between fair level and a good level of health follow-up and fair level of weight control.

Conclusions: The study concluded that women of osteoporosis need to be more complied with health follow up and weight control. Age is the only trait of women's demographic characteristics that has a relationship with their health follow up and weight control.

Recommendations: The study recommend for the conduction of Health education programs about weight control to presented for women with osteoporosis , and mass media can play an essential role in raising women's awareness about health follow up and weight control**.**

Keywords: Assessment, Health Follow up, Weight control, Women, Osteoporosis.

Introduction

Osteoporosis is a chronic status distinguished by the decrease of bone mineral concentration and partial architectonic degradation. Above the age of 50, one out of every three women and one out of every five men are influenced by this disease. Approximate the prevalence of 6.3 per cent in women aged 50 to 54, increasing to 47.2 per cent in women aged 80 to 84 years old. Experts also coined the word "fracture series" or "osteoporotic profession" to describe how unhandled osteoporosis increases the likelihood of more fragility fracture [(1)].

It is a growing health problem as the world's population grows. Many therapies that demonstrated effectiveness for limiting fracture risk are available, and preventative measures for limiting fall have been established. Many physicians, however, are unaware that a fragility fracture may be used to diagnose osteoporosis. As a consequence, osteoporosis in the elderly is rarely diagnosed and treatment following a fracture [(2)].

The American College of Physicians (ACP) recently released recommendations for the prevention of fractures in patients with low bone density or osteoporosis. ACP recommends that clinicians should submit pharmacological treatment to minimize the risk of spine and hip fractures in women with osteoporosis. "Clinicians should provide pharmacologic treatment with alendronate, Risedronate, Zolendronic acid, or Denosumab to minimize the risk of hip and vertebral fractures in women who have osteoporosis according to ACP [(3)].

Vitamin D supplementation alone does not reduce the incidence of fractures, according to a meta-analysis. Another meta-analysis, on the other hand, found a reduction in fracture risk at both vertebral and non-vertebral sites. However, calcitriol has been shown to reduce bone loss in osteoporosis patients. In postmenopausal osteoporotic women, the recommended daily intake of calcium and vitamin D is 1200 mg (total consumption through diet and supplements) and 800 international units (IU), respectively. In premenopausal osteoporotic women, these quantities can be modified to 1000 mg and 60 IU, among postmenopausal women respectively [(4)].

Physical activity, nutritional intervention, drugs, and surgery are among the options for decreasing weight. Behavioral adjustment through physical exercise and nutrition intervention is the most important of these strategies. Age, sex, socioeconomic status, chronic disease, and weight status are directly related to behavior adjustment. Individuals who are overweight or obese and have a negative perception of their weight are more likely to engage in unhealthy weight-control activities. As a result, proper weight perception is critical for good weight control behavior [(5)].

Overweight and obesity are defined by the World Health Organization (WHO) as an abnormal or excessive fat accumulation that might harm one's health. Obesity, as measured by BMI, is linked to an increased risk of fracture at some locations, according to studies comparing the incidence of fractures in obese and non-obese people [(6)].

Methodology

This chapter displays the adopted study method to which the study objectives were achieved that include the study design, study sample, the study instruments, the validity of the study, reliability of the study, rating and scoring of the study, data collection, data analysis and ethical considerations.

Study Design: A descriptive evaluative study design was conducted to assess the health follow up and weight control for women with osteoporosis in Baqubah City, for the period from September 26th, 2020 to 20th Jun 2021.

Study Sample: Non- probability (convenient) sample of (70) women with osteoporosis are selected from (5) private clinics for joints and fractures in Baqubah City.

The Study Instruments: The instrument was constructed and adopted in a form of a questionnaire through the instruction of the supervisor depending on an intensive review of any relevant literature and studies. The

final study instrument consisted of three parts.

Part I: Socio Demographic Characteristics: The socio demographic characteristic of women which include: Age, marital status, educational level, monthly income and place of residence.

Part II: Health Follow up

This part includes (8) items concerning the health follow up for women with osteoporosis.

Part III: Weight Control

This part include (5) items concerning weight control for women with osteoporosis.

Validity of the Study: The content validity of the study tool is determined through the panel of (10) experts to inspect the clarity, suitability, and adequacy of the tool to achieve the objectives of the study.

Reliability of the Study: Internal consistency reliability of the study tool is determined through the use of split-half technique and the computation of Cronbach alpha correlation coefficient on responses of (10) women with osteoporosis. The correlation coefficient is (r=0.89) which indicates that the questionnaire is an adequately reliable measure.

Rating and Scoring: The responses for these questions are scored and rated on two levels dichotomous scale; (2) points for (Yes) and (1) point for (NO). The Scores of responses are categorized according to the following:

(11-14.66) = poor level of health follows up and weight control, (14.67-18.33) = fair level of health follows up and weight control and (18.34-22) = good level of health follow up and weight control.

Cutoff point $\frac{1+2}{2}$= 1.5

MS < 1.5 means as low.
MS = 1.5 means as moderate.
MS > 1.5 means as high.

Data Collection: Data were collected through the use of the study tool (questionnaire). The researcher used the interview technique, pen and paper to collect information after agreeing with doctors of private clinics to conduct an interview with women with osteoporosis , data collection process begun from February 20th, 2021 to April 27th, 2021.

Data Analysis: The data of the present study is analyzed through using the Statistical Package of Social Sciences (SPSS), version (23). The researchers used descriptive and inferential data analysis to analyze the results.

Implication of the study

In an effort to address the gap in the management of osteoporosis, ensure that patients are assessed for the risk of low bone density and the risk of fractures due to lack of weight control or lack of interest in their health follow-up, and present the responsible health institutions to provide preventive and curative management of osteoporosis.

Ethical Considerations: Ethical approval has been granted from the Scientific Research Ethical Committee at the College of the Nursing University of Baghdad before the initial conduct of the original study, also permission has been obtained from physicians at private clinics for joints and fractures in Baqubah city for data collection. To participate in the study, the women with osteoporosis have been assigned a consent agreement. They have been introduced with the study objectives and they are presented with the opportunity of being aware of the study affairs. They also have the full right to withdraw from participation in the study

Results

Table (1): Distribution of Socio-demographic Characteristic for the Study Sample (N: 70)

Characteristics	Frequency	Percent
Age (Years):		
30-39	19	27.16
40-49	20	28.57
50-59	12	17.14
60-69	15	21.42
70-79	4	5.71
Marital Status:		
Married	45	64.3
Single	5	7.1
Divorced	3	4.3
Separated	0	0.0
Widowed	17	24.3
Education:		
Unable to read and write	10	14.3
Able to read and write	18	25.7
Elementary school graduate	18	25.7
Middle school graduate	13	18.6
High school graduate	1	1.4
College graduate	10	14.3
Postgraduate	0	0.0
Occupation:		
Employed	8	11.4
Self-employed	1	1.4
Retired	3	4.3
Housewife	58	82.9
Family Monthly Income:		
Less than 301 thousand dinar	5	7.1

301- 600 thousand dinar	32	45.7
601- 900 thousand dinar	27	38.6
901- 1,200,000 dinar	6	8.6
1,201,000 – 1,500,000 dinar	0	0.0
More than 1,500,000 dinar	0	0.0
Residency:		
Urban	33	47.1
Rural	37	52.9

Results, out of this table, depict that most of the women in the present study are (40-49) years old (28,57%), married (64.3%), able to read and write (25.7%) and elementary school graduates (25.7%), housewife (82.9%), have an income of (301-600) thousand dinar (45.7%) and living in the rural area (52.9%).

Table (2): Overall Assessment of Women's with Osteoporosis Health Follow-up

Poor (8-10.66)	Fair (10.67-13.33)	Good (13.34-16)
8(11.43%)	**33(47.14%)**	**29(41.43%)**

Results, out of this table, present that most of these women have a fair level of health follow-up (47.14%).

Table (3): Mean of Scores on Items of Women's Health Follow-up

Health Follow-up				
Items	**Yes**	**NO**	**MS**	**Assessment**
1. I see the specialist physician regularly and periodically.	**45**	**25**	**1.64**	**High**
2. I follow the instructions of the specialist regarding the lifestyle.	**47**	**23**	**1.67**	**High**
3. Expose to sunlight for 10-15 minutes a day, or (30) minutes between days At least in light clothing.	**61**	**9**	**1.87**	**High**
4. I take the medications for the disease recommended by the specialist.	**70**	**0**	**2.0**	**High**
5. I take vitamin D supplements as per the prescription of the doctor.	**34**	**36**	**1.49**	**Low**
6. I avoid taking other medicines without consulting a physician.	**22**	**48**	**1.31**	**Low**
7. I check my bone density periodically.	**42**	**28**	**1.6**	**High**
8. I regularly check my calcium and vitamin D levels.	**26**	**44**	**1.37**	**Low**

MS: Mean of Scores, High: MS > 1.5, Low: MS < 1.5

Results, out of this table, indicate that the mean of scores on items of health follow-up is high on items 1, 2, 3, 4, and 7 and low on items 5, 6, and 8.

Table (4): Overall Assessment of Women's with Osteoporosis Weight Control

Poor (5-6.66)	Fair (6.67-8.33)	Good (8.34-10)
12(17.14%)	52(74.29%)	6(8.57%)

Results, out of this table, present that most of these women have fair level of weight control (74.29%).

Table (5): Mean of Scores on Items of Women's Weight Control

Weight Control				
Items	**Yes**	**No**	**MS**	**Assessment**
1. Exercise 2-3 times a week.	**2**	**68**	**1.03**	**Low**
2. I avoid eating foods that contain large amounts of fat.	**54**	**16**	**1.77**	**High**
3. I eat foods that contain few calories.	**29**	**41**	**1.41**	**Low**
4. Sit for less than 6 hours a day.	**66**	**4**	**1.94**	**High**
5. I am constantly monitoring and measuring my weight.	**17**	**53**	**1.24**	**Low**

MS: Mean of Scores, High: MS > 1.5, Low: MS < 1.5

Results, out of this table, indicate that the mean of scores on items of weight control is low on items 1, 3, and 5 and high on items 2 and 4.

Table (6): Stepwise Multiple Linear Regression for the Relationship between Women's Socio-demographic Characteristics and their Health Follow up and Weight Control

Model	Sum of Squares	Degree of Freedom	Mean Square	F-Statistics	Significance
Regression	883.868	1	883.868	39.365	0.000[b]
Residual	1526.832	68	22.453		
Total	2410.700	69			

Results, out of this table, show that women's age has a highly significant relationship with their health follow up and weight control.

Discussion

Data analysis of the findings revealed that most women are at the age of (40-49) year. Age is an important non-modifiable risk factor for osteoporosis.

Most women's bone mass remains stable until menopause, when the loss of estrogen in conjunction with aging is associated with a decline in bone mineral density [7].

A study reported that BMD declined significantly in postmenopausal women in the 45–50 year age range, after which there was no substantial reduction in BMD in further age groups[8]. Another study reported that women with osteoporosis usually are at early menopause[9].

a cross-sectional analysis of gender differences and socioeconomic factors related to osteoporosis in the Greater São Paulo, Southeastern Brazil, depicted that the vast majority of women (90.9 percent) were in menopause, and age is the key risk factor for low bone mass [10].

Concerning women's marital status and occupation, most of them are married and housewives.

Women during pregnancy are exposed to physiological changes that make them more likely to have osteoporosis.

This finding is supported by a study reported that (80.5%) of the participants were married, and (89.2%) were housewives [11].

Regarding women's education, most of them are just able to read write, and elementary school graduates.

The level of education greatly affects the extent to which women know about osteoporosis and how to care for them. This finding is supported by a study reported that osteoporosis was more prevalent in women who had a low household income and had a low level of education [12].

Another study reported that low education was more highly associated with osteoporosis prevalence in women than in men[13].

Cultural and educational barriers make women in Arab countries more vulnerable to osteoporosis [14] .

Concerning women's family monthly income, most of them are with low family monthly income (301,000-600,000) thousand/month. The economic status of women is one of the necessary factors that affect nutrition and exercising for osteoporosis.

This finding is consistent with study reported that women with a personal annual income of less than $20,000 had lower hip and spine bone mineral density than their higher-income counterparts[15].

There is a positive association between socio economic status and bone mineral density, such as higher utilization rates in higher income women [16] .

Women's residency show that more than half of them live in rural areas and the remaining are living in urban areas. Living in rural areas is more likely to develop osteoporosis due to their low education and lack of health services.

The finding is consistent with study stated that site of residence was a significant predictor of T score [17].

Health follow-up is necessary for women with osteoporosis and is considered part of self-care. The findings concerning this issue show that most of them are between fair level and a good level of health follow-up (Table 2). Most of them follow the instructions of their physician; take the medications for the disease as recommended; check bone density periodically and expose to sunlight for 10-15 minutes a day or (30) minutes per day (Table 3). This finding is sustained by study reported that any follow-up, bone mineral density testing for postmenopausal women should be done on the same machine and at the same time of year[18].

Women's weight control is impartial. These women do not exercise; they eat foods with high calories; they don't constantly monitor their weight.

It is necessary to maintain a reasonable body weight to balance bone health and other metabolic disorders [19].

A Study reported that overweight and obesity were highly prevalent among osteoporosis fracture patients, and particularly females, who had a higher BMI than their male counterparts [20].

Another study found that (52.6%) of patients with osteoporosis had normal body mass index, while (11.9%) were obese (30+) [21] .

There are data indicated that women with high body mass index are protected from osteoporosis, increasing evidence seems to show conflicting results regarding this issue, suggesting that obesity might actually interfere with bone health [22].

In the current study, osteoporotic women's age affects their health follow up and weight control.

The age of women with osteoporosis is directly related to the risk of falling that affect their physical activity and weight control and the older the women are, the less commitment to healthy behaviors and exercise, as well as their exposure to other diseases that negatively affect their condition.

A pooled analysis of four studies in North America, Europe, and Australia, reported that fracture risks were greater in older patients. On average, for every 1-year increase in age, a patient's risk for osteoporosis related fractures increased 3.6% [23].

Conclusion

The study concluded that women of osteoporosis need to be more complied with health follow up and weight control. Age is the only trait of women's demographic characteristics that has a relationship with health follow up and weight control.

Recommendations

Health education programs about weight control need to be designed and presented for women with osteoporosis, and mass media can play an essential role in raising women's awareness about health follow up and weight control.

References

1. Walters, S., Khan, T., Ong, T., & Sahota, O. (2017). Fracture liaison services: improving outcomes for patients with osteoporosis. Clinical interventions in aging, 12, 117–127. doi:10.2147/CIA.S85551.
2. Warriner, A. H., Outman, R. C., Saag, K. G., Berry, S. D., Colón-Emeric, C., Flood, K. L., Lyles, K. W., Tanner, S. B., Watts, N. B., & Curtis, J. R. (2009). Management of osteoporosis among home health and long-term care patients with a prior fracture. Southern medical journal, 102(4), 397–404. doi: 10.1097/SMJ.0b013e31819bc1d3.
3. Kanis, J. A., Cooper, C., Rizzoli, R., & Reginster, J. Y. (2018). Review of the guideline of the American College of Physicians on the treatment of osteoporosis. Osteoporosis International, 29(7), 1505-1510.doi: 10.1007/s00198-018-4504-y.
4. Tabatabaei-Malazy, O., Salari, P., Khashayar, P., & Larijani, B. (2017). New horizons in treatment of osteoporosis. DARU Journal of Pharmaceutical Sciences, 25(1), 1-16. Doi: 10.1186/s40199-017-0167-z.
5. Hwang, J. H., Ryu, D. H., & Park, S. W. (2015). Interaction effect between weight perception and comorbidities on weight control behavior in overweight and obese adults: Is there a sex difference?. Journal of Korean medical science, 30(8), 1017. doi:10.3346/ jkms.2015.30.8.1017.
6. Fassio, A., Idolazzi, L., Rossini, M., Gatti, D., Adami, G., Giollo, A., & Viapiana, O. (2018). The obesity paradox and osteoporosis. Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 23(3), 293-302. doi: 10.1007/s40519-018-0505-2.
7. McLendon, A. N., & Woodis, C. B. (2014). A review of osteoporosis management in younger premenopausal women. Women's Health, 10(1), 59-77. doi: 10.2217/WHE.13.73.

8. Kadam, N. S., Chiplonkar, S. A., Khadilkar, A. V., & Khadilkar, V. V. (2018). Prevalence of Osteoporosis in Apparently Healthy Adults above 40 Years of Age in Pune City, India. Indian journal of endocrinology and metabolism, 22(1), 67–73. doi:10.4103/ijem.IJEM_438_17.
9. Beserra Da Silva, R., Costa-Paiva, L., Siani Morais, S., Mezzalira, R., Oliveira Ferreira, N. D., & Mendes Pinto-Neto, A. (2010). Predictors of falls in women with and without osteoporosis. journal of orthopaedic & sports physical therapy, 40(9), 582-588. doi:10.2519/jospt.2010.3239
10. Pinheiro, M. M., dos Reis Neto, E. T., Machado, F. S., Omura, F., Yang, J. H., Szejnfeld, J., & Szejnfeld, V. L. (2010). Risk factors for osteoporotic fractures and low bone density in pre and postmenopausal women. Revista de saude publica, 44(3), 479-485. doi: 10.1590/S0034-89102010000300011.
11. Fatima, M., Nawaz, H., Kassi, M., Rehman, R., Kasi, P. M., Kassi, M. & Baloch, S. N. (2009). Determining the risk factors and prevalence of osteoporosis using quantitative ultrasonography in Pakistani adult women. Singapore medical journal, 50(1), 20.
12. Noh, J. W., Park, H., Kim, M., & Kwon, Y. D. (2018). Gender differences and socioeconomic factors related to osteoporosis: a cross-sectional analysis of nationally representative data. Journal of Women's Health, 27(2), 196-202. 8 . https://doi.org/10.1089/jwh.2016.6244 .
13. Sweileh, W. M., Al-Jabi, S. W., Zyoud, S. H., Sawalha, A. F., & Ghanim, M. A. (2014). Osteoporosis is a neglected health priority in Arab World: a comparative bibliometric analysis. Springer Plus, 3(427), 5-7. https://doi.org/10.1186/2193-1801-3-427 .
14. Kim, J., Lee, J., Shin, J. Y., & Park, B. J. (2015). Socioeconomic disparities in osteoporosis prevalence: different results in the overall Korean adult population and single-person households. Journal of preventive medicine and public health, 48(2), 84–93.doi: 10.3961/jpmph.14.047.
15. Demeter, S., Leslie, W. D., Lix, L., MacWilliam, L., Finlayson, G. S., & Reed, M. (2007). The effect of socioeconomic status on bone density testing in a public health-care system. Osteoporosis international, 18(2), 153-158. https://doi.org/10.1007/s00198-006-0212-0 .
16. Du, Y., Zhao, L. J., Xu, Q., Wu, K. H., & Deng, H. W. (2017). Socioeconomic status and bone mineral density in adults by race/ethnicity and gender: the Louisiana osteoporosis study. Osteoporosis International, 28(5), 1699-1709. doi: 10.1007/s00198-017-3951-1.
17. Kenny, A. M., Smith, J., Noteroglu, E., Waynik, I. Y., Ellis, C., Kleppinger, A., & Walsh, S. (2009). Osteoporosis risk in frail older adults in assisted living. Journal of the American Geriatrics Society, 57(1), 76-81. doi:10.1111/j.1532-5415.2008.02072.x.
18. Tella, S. H., & Gallagher, J. C. (2014). Prevention and treatment of postmenopausal osteoporosis. The Journal of steroid biochemistry and molecular biology, 142, 155-170. doi:10.1016/j.jsbmb.2013.09.008.
19. Alseddeeqi, E., Bashir, N., AlAli, KF., Ahmed, LA. (2020). Characteristics of patients with low-trauma vertebral fractures in the United Arab Emirates: a descriptive multi-center analysis. Endocr J, 67(7). 785- 791. doi:10.1507/endocrj.EJ20-0013.
20. Al-nuaimi, A. M. K., Hussain, S. A., & Alkazzaz, A. (2014). Effect of Body Mass Index and Physical Activities on Risk of Osteoporosis in Babylon Iraq. Medical Journal of Babylon, 11(1), 173-187.

21. Sheng, Z., Xu, K., Ou, Y., Dai, R., Luo, X., Liu, S., ... & Liao, E. (2011). Relationship of body composition with prevalence of osteoporosis in central south Chinese postmenopausal women. Clinical endocrinology, 74(3), 319-324. doi:10.1111/j.1365-2265.2010.03941.x.
22. Migliaccio, S., Greco, E. A., Fornari, R., Donini, L. M., & Lenzi, A. (2011). Is obesity in women protective against osteoporosis?. Diabetes, metabolic syndrome and obesity: targets and therapy, 4, 273- 282. https://doi.org/10.2147/DMSO.S11920.
23. Boonen, S., Klemes, A. B., Zhou, X., & Lindsay, R. (2010). Assessment of the relationship between age and the effect of risedronate treatment in women with postmenopausal osteoporosis: a pooled analysis of four studies. Journal of the American Geriatrics Society, 58(4), 658-663. doi:10.1111/j.15325415.2010.02763.x.