



## Adherence and Utilisation

# Knowledge and health literacy are not associated with osteoporotic medication adherence, however income is, in Arab postmenopausal women



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## ABSTRACT

**Objective:** To investigate the association between adherence with oral bisphosphonate treatment, income, health literacy, knowledge, and receiving instructions from a pharmacist or doctor, among Arab postmenopausal women diagnosed with osteoporosis in Israel.

**Methods:** Arab osteoporotic women treated with oral bisphosphonates were interviewed (303 women). The questionnaire included socio-demographic characteristics, knowledge about osteoporosis and health literacy. Adherence was measured by the Medication Possession Ratio (MPR) according to the number of prescription refills registered in the database of Clalit Health Services.

**Results:** Forty-one percent of the women were adherent according to the MPR. The main predictor of adherence in a multivariate logistic regression was income. Health literacy and knowledge were not associated with adherence after adjustment for income. Neither was the health care provider's counseling regarding the medication.

**Conclusions:** Lower income seems to be a barrier to adherence with osteoporotic medication, over and above other known barriers. Policy makers should take into account that medication funding may be a barrier to treatment. Practical implications Income may be a major barrier to adherence with osteoporosis medication and calls for attention of practitioner.

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## 1. Introduction

Osteoporosis is a chronic condition that causes the bones to become fragile, brittle, thin, weak, and therefore more likely to fracture [1]. The prevalence of osteoporosis increases with age [2]. No objective figures have been published regarding the prevalence of osteoporosis in Israel. The estimated prevalence is 28% in those 65 years and older [3]. During 1997–1998, 24% of the Jewish women reported having being diagnosed with osteoporosis compared to only 8% of the Arab women [4].

New medications for the treatment of osteoporosis have been introduced in recent years [5]. Oral bisphosphonates are currently the first-line therapy for postmenopausal osteoporosis [6]. Bisphosphonates must be taken with plain water (tablets 6–8 oz; oral solution follow with 2 oz) after an overnight fast, at least 30 min before the first food, beverage, or other medication of the day. Patients should be instructed to stay upright (not to lie down) for at least 30 min and until after the first food of the day, to reduce esophageal irritation. However, bisphosphonates are costly, and may be associated with significant side effects [7].

Poor medication adherence is a key limiting factor in the prevention and treatment of chronic conditions [8]. Achieving adherence is even more difficult for a nearly asymptomatic condition such as osteoporosis, where the perceived risks are low and the “costs” – both monetary and non-monetary – are high [9].

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Bisphosphonate adherence rates are low, with weekly dose adherence rates better than daily dose rates but still suboptimal [10,11].

Good adherence rates of 55.3% for weekly bisphosphonate users were found in the USA [12] and only 37% had good adherence rates among the daily dose-only group in Israel [9]. A study in Israel, found that 23% of the women discontinued the osteoporotic medication during the initial six months [13]. Therefore, it seems that adherence with this medication is far from optimal.

The World Health Organization has categorized potential reasons for medication non-adherence in general into 5 groups that include the patient, condition, type of therapy, socioeconomic status, and health system-related factors. Patient factors include such things as age, health literacy, patient's knowledge, nonwhite race and forgetfulness. Therapy related factors include the complexity of the regimen and medication side effects. Socioeconomic factors include education, income and the cost of the medication [14–16].

A large range of factors have been suggested to have an effect on adherence with medication for osteoporosis. As patients often have no symptoms until they suffer a fracture, they do not feel that the treatment is worth taking or do not believe they are at risk. Patients also find the strict dosing instructions for bisphosphonates difficult to follow, fasting and posture requirements can be inconvenient and often not feasible in the daily routine [17].

Patients' knowledge is not always adequate and this may be a barrier to adherence. Therefore patient education is an important element to achieve adherence. Counseling about medication is a very useful method to increase knowledge and therefore adherence. Healthcare providers serve as a major source of information for patients regarding the disease and treatment and therefore are an essential element in achieving adherence [18]. As instructions for taking the medication are difficult to follow many patients have difficulty understanding their doctors' instructions. Even immediately after leaving the physician's office or the hospital, patients may recall no more than 50% of the important information just given to them [19].

Therefore, factors that may influence knowledge and understanding of the importance of the medication and the actual behaviors needed are important to identify. Low health literacy may be a barrier in fully comprehending and acting upon medical advice, using standard patient education methods [19]. Previous studies have shown that low health literacy may affect adherence with recommended medical treatments, such as taking medications [20,21].

Studies have consistently shown that higher levels of knowledge are associated with increased awareness of osteoporosis and its risk, as well as with improved lifestyle behaviors [22]. In Israel, Jewish osteoporotic women have been shown to have higher levels of knowledge regarding osteoporosis compared to osteoporotic Arab women [23].

In Israel, all persons are covered by a comprehensive basic health insurance. In addition, to the basic package, people can purchase complementary insurance if they want to. Around 75% of the population purchases complementary medical insurance [24].

Medication is provided for a subsidized cost. The complementary medical insurance gives a 50% discount on the weekly bisphosphonate purchase [7]. The price the women had to pay for the weekly bisphosphonate medication at the period this study was conducted was around 25\$ per month, and 15\$ for the daily bisphosphonate, per woman who does not have an extended medical insurance.

As adherence with osteoporotic medication seems to be low in other studies and especially in the minority population of Arab women, the objectives of this study were to identify the factors (knowledge, health literacy, counseling and income) that are

associated with adherence with bisphosphonate medication, among the minority of Arab postmenopausal osteoporotic women in Israel.

## 2. Methods

### 2.1. Design and setting

The study consists of a cross-sectional telephone survey targeting Israeli Arab postmenopausal women over the age of 60, diagnosed with osteoporosis and insured by Clalit Healthcare Services. Clalit Healthcare Services is the largest healthcare service and insures about 60% of the Israeli population. Only women that were registered as being treated with weekly bisphosphonates were included in the study sample, most women are prescribed the weekly and not the daily medication. The study was conducted in the spring of 2010. The interviews were conducted by the first author in Arabic during week days at all times of the day and evening for maximal response rates. Each woman was contacted by phone and asked if she is willing to answer the questionnaire. The woman was told that it is an anonymous questionnaire and the information would be used only for research purposes. The study objectives were explained and she was told that she could stop the interview at any time. The study received the approval of the Clalit Healthcare Services ethics committee.

### 2.2. Participants

All osteoporotic women, eligible for the study, from three clinics of Clalit Health Services in a large northern town in Israel were extracted from the database, this included 638 women. A total of 303 women were interviewed. Out of the 335 who were not included in the study, 7 women died, another 133 women could not be reached due to inaccurate phone numbers, or no available phone number, 95 did not answer the phone after at least three phone calls, 27 refused to participate, 36 could not participate due to health conditions, 37 women claimed that they did not receive medication because they are not osteoporotic or that they received only calcium supplement, these women did not answer the questionnaire. Hence, the participation rate of those eligible was 65.7%.

### 2.3. Questionnaire and variables

The questionnaire included four parts:

1. Osteoporosis Knowledge Questionnaire (OKQ): a 12 item instrument with true, false and do not know responses, was drafted based on the Australian Osteoporosis Knowledge Assessment Tool (OKAT) [25,26]. The analysis was performed by scoring 1 for a correct response and 0 for an incorrect or do not know response. The total score ranged from 0 to 12. The maximal possible score was 12, which indicated excellent knowledge concerning the risk factors of osteoporosis and the prevention of it. The questionnaire included questions about the symptoms of the disease, the epidemiology of the disease, risk factors and preventative factors, and about the treatment. Up to four correct answers out of the 12 items was defined as low knowledge level, 5–8 correct answers was defined as medium knowledge level and above nine correct answers was defined as high knowledge level [26]. In the regression we entered knowledge as a categorical variable divided into three groups.
2. Health literacy (HL) questionnaire: a 14 item instrument was developed based on Ishikawa's questionnaire [27]. Each item was rated on a four point scale, ranging from 1 (never) to 4

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