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Research Article

Assessment of Knowledge and Beliefs toward Osteoporosis among Iraqi Perimenopausal Women

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Abstract

Background: Osteoporosis is becoming more common, especially among women. Prevention through educational initiatives is the best way to lower disease burden. ***Objective***: To estimate perimenopausal women's knowledge and attitudes concerning osteoporosis and their relation to specific sociodemographic characteristics. ***Methods***: 391 perimenopausal women who were utilizing the outpatient clinic facilities at the hospitals in Al-Najaf City participated in a cross-sectional study. Starting in May 2022, data was gathered throughout six months. Data were gathered using a questionnaire that asked about sociodemographic factors, the Osteoporosis Knowledge Assessment Tool, and the Osteoporosis Health Belief Scale. ***Results***: In this study, a substantial proportion of the participants have poor knowledge (61.89%), while average and good knowledge encompass 31.97% and 6.10% of the participants, respectively. The mean score for osteoporosis knowledge was 7.18±3.49. About osteoporosis health beliefs, the best belief of women is in perceiving the benefits of calcium intake; the mean score was 20.32±4.69. A significant positive correlation (p<0.001) was found between knowledge and exercise benefits, calcium intake benefits, perceived severity, and health motivation. Whereas, a significant negative correlation (p<0.001) was found between knowledge and barriers to calcium intake and barrier to exercise. ***Conclusion***: The participants have below-average knowledge and beliefs regarding osteoporosis. Knowledge of osteoporosis correlates positively with health beliefs, including perceived susceptibility, health motivation, the benefit of calcium intake, and the benefit of exercise, whereas it correlates negatively with barriers to calcium and barriers to exercise.

Keywords: Beliefs, Knowledge, Osteoporosis, Perimenopause women.

تقييم المعرفة والمعتقدات تجاه هشاشة العظام لدى النساء العراقيات في فترة ما قبل انقطاع الطمث

الخلاصة

الخلفية: أصبحت هشاشة العظام أكثر شيوعا، خاصة بين النساء. الوقاية من خلال المبادرات التعليمية هي أفضل طريقة لتخفيف عبء المرض. **الهدف**: تقدير معرفة ومواقف النساء في فترة ما قبل انقطاع الطمث فيما يتعلق بهشاشة العظام وعلاقتها بخصائص اجتماعية ديموغرافية محددة. **الطريقة**: شاركت 391 امرأة في فترة ما قبل انقطاع الطمث ممن يراجعن العيادات الخارجية في مستشفيات مدينة النجف في دراسة مقطعية. بدءا من مايو 2022 ، تم جمع البيانات طوال فترة ستة أشهر باستخدام استبيان يسأل عن العوامل الاجتماعية والديموغرافية، وأداة تقييم المعرفة بهشاشة العظام، ومقياس المعتقدات الصحية لهشاشة العظام. **النتائج**: في هذه الدراسة ، كانت نسبة كبيرة من المشاركين لديهم معرفة ضعيفة (61.89٪)، في حين أن المعرفة المتوسطة والجيدة تشمل 31.97٪ و 6.10٪ من المشاركين، على التوالي. كان متوسط درجة معرفة هشاشة العظام 7.18±3.49. حول المعتقدات الصحية لهشاشة العظام ، فإن أفضل اعتقاد للمرأة هو إدراك فوائد تناول الكالسيوم. وكان متوسط النتيجة 20.32±4.69. تم تسجيل علاقة إيجابية كبيرة بين فوائد المعرفة والتمرين، وفوائد تناول الكالسيوم، والشدة المتصورة، والدافع الصحي. كما تم العثور على علاقة سلبية كبيرة بين المعرفة والحواجز التي تحول دون تناول الكالسيوم وحاجز ممارسة الرياضة. **الأستنتاج**: لدى المشاركات معرفة ومعتقدات أقل من المتوسط فيما يتعلق بهشاشة العظام. ترتبط معرفة هشاشة العظام ارتباطا إيجابيا بالمعتقدات الصحية، بما في ذلك الحساسية المتصورة، والدافع الصحي، وفائدة تناول الكالسيوم، وفائدة الرياضة، في حين أنها ترتبط سلبا بالحواجز التي تحول دون استخدام الكالسيوم والحواجز التي تحول دون ممارسة الرياضة.

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INTRODUCTION

Osteoporosis is a disorder characterized by low bone mass and microarchitectural bone tissue degradation. It enhanced bone fragility and, as a result, fracture susceptibility [1]. Osteoporosis is a major public health issue worldwide [2]. The socioeconomic burden of osteoporosis is increasing substantially as the world's population ages [2,3]. A meta-analysis of research found that the prevalence of osteoporosis among the elderly was 21.7%, with osteoporosis being roughly three times greater in elderly women than in elderly males (35.3% versus 12.5%) [4]. More than 8.9 million osteoporotic fractures have been documented worldwide [2]. Statistics show that one in every five adult men and one in every two adult women may get a fragility fracture over their lifetime [4]. Premenopausal women had a prevalence of osteoporosis and osteopenia of 26.7% and 3.3%, respectively, according to a recent study in Iraq, while postmenopausal women had a prevalence of 34.2% and 52.5%, respectively [5]. In women, estrogen deprivation accelerates osteoporosis after menopause. Furthermore, estrogen promotes osteogenesis and helps maintain a good calcium balance. After menopause, bone loss accelerates at a rate of 2%–5% each year, which may persist for the next decade [6]. Lifestyle adjustments, including getting enough calcium and vitamin D and exercising regularly, can help to slow or stop the course of osteoporosis [1,7]. Furthermore, osteoporosis drugs can help prevent fractures and reduce bone loss [1,7]. The most cost-effective technique for osteoporosis prevention is to prioritize education [8,9]. Unfortunately, in poorer countries, low knowledge rates and a lack of awareness of osteoporosis symptoms and risk factors continue to be observed [10–13]. Understanding what women know about the disease and how much preventive activity they engage in is critical for developing therapies [14]. There is little evidence available to us about perimenopausal women's awareness and beliefs about osteoporosis in Iraq. As a result, the purpose of this study is to analyze perimenopausal women's osteoporosis knowledge and beliefs, as well as their associated factors, and to determine whether knowledge correlates with their health beliefs.

METHODS

Study design and setting

An analytical cross-sectional study was conducted among perimenopausal women visiting outpatient clinic units for preventive or therapeutic reasons, at Al-Sadder teaching hospital in Al-Najaf City during the period from 1st of May to 1st of November 2022.

Study population and sampling technique

The study included a sample of 391 women who attended outpatient clinics for health problems or were in a company with a relative who visited an outpatient clinic. A nonprobability-purposive sampling technique was used to select the participants. The study included perimenopausal women ≥ 35 years old. Menopause and women with osteoporosis that were confirmed by clinical examination and diagnostic tests were excluded.

Sample size

Minimal sample size was estimated to be 385 considering a confidence interval of 95%, precision of 5%, and the prevalence of good osteoporosis knowledge was assumed to be 50% for ensuring an adequate sample.

Study instruments

Data were gathered through interviews with participants using a questionnaire that included three parts: the first included socio-demographic characteristics such as age, residence, marital status, educational level, occupation, income, previous personal history of fracture, family history of osteoporosis, and bone fracture. The second element of the study involves estimating osteoporosis knowledge using a self-reported osteoporosis knowledge assessment tool (OKAT) questionnaire [15]. The OKAT is a valid and reliable questionnaire for assessing osteoporosis knowledge [16]. Winzenberg and colleagues created it in 2003 as a twenty-item questionnaire with "yes," "no," and "I don't know" responses for each issue. OKAT is organized around three primary themes: awareness of osteoporosis symptoms and fracture risk; awareness of osteoporosis preventative factors such as nutrition and exercise; and awareness of treatment cost. The third section of the questionnaire assesses women's beliefs about osteoporosis using the osteoporosis health belief scale (OHBS), which Kim and co-authors designed to examine osteoporosis health beliefs. Its goal is to measure people's views on calcium consumption and exercise behaviors. The tool includes seven subscales to assess perceived osteoporosis susceptibility, osteoporosis severity, exercise advantages, calcium intake benefits, exercise obstacles, calcium intake barriers, and health motivation [17].

OKAT and OHBS score calculation

For OKAT items, answers (yes, I don't know, and no) will be used with an item score of '1' for the correct response and '0' for the incorrect response, then summation of the degree of question answers for each participant and giving score as follows: poor knowledge (<8), average knowledge (8–12), and good knowledge (>12). In the OHBS, items are rated on a 5-point Likert scale from strong disagreement (1) to strong agreement (5). Scores on each subscale range from 6 to 30, with a total score range of 42 to 210. For the majority of the subscales, higher values indicate highly healthy beliefs. Higher scores on the two subscales about barriers, on the other hand, imply more negative health beliefs.

Pilot study

A pilot study was carried out before starting the collection of data for one week before collecting the data. To test the questionnaire for any modification, any difficulties and to detect the time needed for the collection of data. The pilot study sample was 20 participants, they were excluded from the study sample and the questionnaire was clear, and did not need any modification.

Ethical consideration

Informed consent will be obtained from participants after discussing the goal of the current research and before they answer the interviewer. The official agreement will be obtained from the ethical committee of the clinical studies in the Faculty of Medicine/ University of Kufa (Reference#: MEC-30).

Statistical analysis

Data entry and analysis were done by using SPSS version 26, a computer software (statistical package for social sciences). Figures and tables were used for the illustration of data. Categorical variables were presented as frequencies and percentages. Continued variables were presented in means and standard deviations. Data of OKAT and OHBS scores were tested for normality using Shapiro–Wilk test, nonparametric and parametric statistical tests were used as appropriate, Chi-square test was used to test the association between knowledge levels and different variables, Spearman's Rho correlation was used to test the association between knowledge levels and different variables, Spearman's Rho correlation was used to test the correlation between knowledge and health beliefs. A p-value < 0.05 was considered statistically significant.

RESULTS

The study sample included 391 women selected from outpatient clinics in AL-Najaf City. Their ages varied from 35 to 50, with a mean of 41.07±4.67 years. Nearly half of the respondents (47.6%) were aged between 35 and 39 years. Most of them were married (67.0%), more than three-quarters of participants (77.0%) live in urban areas, and about half of them were highly educated (46.3%). Further, sociodemographic characteristics are shown in Table 1. Concerning previous personal and family history of fracture and family history of osteoporosis, more than quarter of participants have a previous personal history of bone fracture (27.0%), more than one-third (42.5%) had a family history of previous bone fracture, while a quarter (25.5%) had a family history of osteoporosis, as illustrated in Table 2. More than half of the participants have poor knowledge (61.89%), while the average and good knowledge encompasses (31.97%), and (6.1%), of the participants, respectively (Figure 1).

Table 1: Sociodemographic variables of the participants (n=391)

Variable	n(%)
Age group (years)	
35-39	186(47.6)
40-44	81(20.7)
45-49	113(28.9)
≥ 50	11(2.8)
Residence	
Urban	301(77.0)
Rural	90(23.0)
Marital status	
Single	64(16.4)
Married	262(67.0)
Divorced	46(11.7)
Widow	19(4.9)
Education	
Illiterate	59(15.5)
Primary	81(20.6)
Secondary	69(17.6)
College and above	182(46.3)
Occupation	
Employed	169(43.2)
Housewife	133(34.0)
Free job	89(22.8)
Income	
Insufficient	134(34.3)
Sufficient	201(51.4)
Sufficient and can save	56(14.3)
Age (year) (mean±SD)	41.07±4.667

Association between demographic variables of the women with a level of osteoporosis knowledge is shown in Table 3.

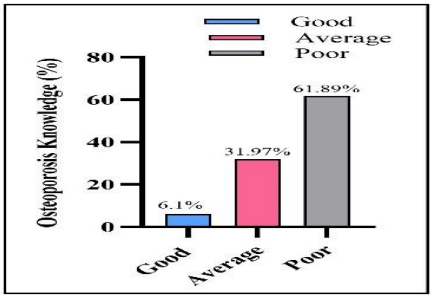

Figure 1: knowledge about osteoporosis among of the participated women.

Table 2: Distribution of participants according to the personal history of fracture and family history of fracture and osteoporosis (n=391)

Variable	n(%)
Previous personal history of fracture	
Yes	105(27.0)
No	286(73.0)
Family history of bone fracture	
Yes	166(42.5)
No	225(57.5)
Family history of osteoporosis	
Yes	100(25.5)
No	291(74.5)

It was reported a significant difference in the level of knowledge regarding to the age groups, the highest level of good and average knowledge was recorded among the group aged 35-39 years with the percentage of (9.1%) and (37.1%) respectively, (p<0.05).

Regarding marital status, single women had the highest level of good and average knowledge (10.9%) and (45.3%) respectively, statistical analysis showed a highly significant difference in the level of knowledge about osteoporosis between different marital status, (p<0.05).

Table 3: Association of osteoporosis knowledge with the socio-demographic characteristics for the participants.

Variable	Good knowledge *n*(%)	Average knowledge *n*(%)	Poor knowledge *n*(%)	Total	*p*-value
Age group (year)					
35-39	17(9.1)	69(37.1)	100(53.8)	186(100.0)	0.041
40-44	4(4.9)	20(24.7)	57(70.4)	81(100.0)	
45-49	3(2.7)	32(28.3)	78(69.0)	113(100.0)	
≥ 50	0(0.0)	4(36.4)	7(63.6)	11(100.0)	
Residence					
Urban	24(8.0)	111(36.9)	166(55.1)	301(100.0)	0.001
Rural	0(0.0)	14(16.5)	76(84.4)	90(100.0)	
Marital status					
Single	7(10.9)	29(45.3)	28(43.8)	64(100.0)	0.008
Married	15(5.7)	84(32.1)	163(62.2)	262(100.0)	
Divorced	1(2.2)	9(19.6)	36(78.3)	46(100.0)	
Widow	1(5.3)	3(15.8)	15(78.9)	19(100.0)	
Education					
Illiterate	0(0.0)	7(11.9)	52(88.1)	59(100.0)	0.001
Primary	0(0.0)	9(11.1)	72(88.9)	81(100.0)	
Secondary	2(2.9)	11 (15.9)	56(81.2)	69(100.0)	
College and above	22(12.1)	98 (53.8)	62(34.1)	182(100.0)	
Occupation					
Employed	21(12.4)	90(53.3)	58(34.3)	169(100.0)	0.001
Housewife	0(0.0)	20(15.0)	113(85.0)	133(100.0)	
Free job	3(3.4)	15(16.9)	71(79.8)	89(100.0)	
Income					
Insufficient	1(0.7)	21(15.7)	112(83.6)	134(100.0)	0.001
Sufficient	15(7.5)	79(39.3)	107(53.2)	201(100.0)	
Sufficient and can save	8(14.3)	25(44.6)	23(41.1)	56(100.0)	

Association between previous personal and family history of fracture and family history of osteoporosis is shown in Table 4. The statistical analysis showed a significant association between level of knowledge and family history of osteoporosis, participants with a family history of osteoporosis have higher knowledge, (11.0%) and (43.0%) levels of good and average knowledge, respectively, whereas participants without family history of osteoporosis have (4.5%) and (28.2%) levels of good and average knowledge in the same order, this difference was a statistically significant (p<0.05). The mean score of the OKAT was 7.18±3.49 out of the total score (20). For the OHBS, the best belief of women is about the perceived benefits of calcium intake as its mean score was 20.32±4.69, followed by the perceived Severity, the mean score of 19.93±5.16 (Table 5). Table 6 illustrated the relationships between Knowledge with Health beliefs. A statistically significant negative correlation was recorded between knowledge and barriers to calcium intake and exercise (r= -0.27, r= -27) respectively, (p<0.001).

Table 4: knowledge about osteoporosis regarding to the personal and family history of fracture and osteoporosis among participants (n=391)

Variable	Good knowledge *n*(%)	Average knowledge *n*(%)	Poor knowledge *n*(%)	Total	*p*-value
Personal history of fracture					
Yes	2(1.9)	42(40.0)	61(58.1)	105(100.0)	0.024
No	22(7.7)	83(29.0)	181(63.3)	286(100.0)	
Family history of bone fracture					
Yes	9(5.4)	61(63.7)	96(57.8)	166(100.0)	0.215
No	15(6.7)	64(28.4)	146 (64.9)	225(100.0)	
Family history of osteoporosis					
Yes	11(11.0)	43(43.0)	46(46.0)	100(100.0)	0.001
No	13(4.5)	82(28.2)	196(67.4)	291(100.0)	
Total	24(100.0)	125 (100.0)	242(100.0)	391(100.0)	

The higher perceived osteoporosis susceptibility is associated with lower levels of knowledge (p<0.001, r=0.25). whereas a significant positive correlation (p<0.001) was shown between knowledge of the benefits of exercise and calcium intake, perceived severity, and health motivation (r=0.36), (r=0.19), (r=0.01), and (r=0.30), respectively (Table 6).

DISCUSSION

Osteoporosis prevention through an educational program is the most effective strategy to lower the risk of future bone fractures.

Table 5: Descriptive statistics of osteoporosis and health beliefs score

Scale (total score)	Mean±SD
Knowledge (20)	7.18±3.49
Perceived Susceptibility (30)	15.96±5.98
Perceived Severity (30)	19.93±5.16
Perceived Benefits of exercises (30)	19.86±5.89
Perceived Benefits of calcium intake (30)	20.32±4.69
Perceived Barriers of exercises (30)	18.98±5.81
Perceived Barriers of calcium intake (30)	17.06±3.67
Motivation (30)	20.15±4.60
All items	132.28±18.22

Table 6: Relationships between osteoporosis knowledge and health beliefs

Knowledge	Health Belief						
	Perceived Susceptibility	Perceived Severity	Benefit of Exercise	Benefit of Calcium intake	Barrier to calcium intake	Barrier to Exercise	Health Motivation
Spearman's Rho	0.25	0.01	0.36	0.19	-0.27	-0.27	0.30
p-value	<0.001	0.836	<0.001	<0.001	<0.001	<0.001	<0.001

Nonetheless, before any educational program is implemented, knowledge must be evaluated so that the program may be adapted to the individual needs of the population. Current findings revealed poor osteoporosis knowledge among women; this result is compatible with other studies conducted in north Iraq, Saudi Arabia, Lebanon, and Egypt [11-13,18] that reported poor knowledge regarding osteoporosis among participants. In contrast, other studies conducted in Syria, and Malaysia found participants had an average osteoporosis knowledge score [19,20], These disparities between studies could be attributed to the use of different tools for assessing osteoporosis knowledge, in addition to the studies conducted among different populations. Considering the association between osteoporosis knowledge and sociodemographic characteristics of the participants, statistically significant differences in the knowledge score were found between different age groups of women (p=0.041), the youngest group (35–39 years) being the most knowledgeable. This finding is analogous to that of another research conducted in Egypt by Mortada *et al*. (2020) [18], whereas Al Adwani *et al*. (2019) showed that age is not a significant factor for osteoporosis knowledge [21]. The current result could be due to the fact that younger participants have more interest in gaining knowledge and are active information seekers. Currently, graduated participants have a statistically significant higher proportion of good and average knowledge than other educational levels (p=0.001). The direct relation between education and osteoporosis knowledge in this study is not surprising, as it was identified by previous studies that identified education as a significant factor for osteoporosis knowledge [18,20,21]. Although Alshareef *et al*. [13] found that educational level is not a significant factor in osteoporosis knowledge, educational status was identified as the most powerful influencing factor for knowledge level across all knowledge domains; subjects with higher educational status may have a greater opportunity to obtain knowledge from health-related internet sites, social media, and books [22]. Employed participants had a significantly higher proportion of good awareness, as compared with housewives and free-job women (p=0.001). This finding disagrees with a previous study [20]. The current result can be explained by the fact that the working women mostly had a high level of education, so their knowledge level is expected to be higher. In this study, the level of knowledge about osteoporosis was significantly associated with residence and financial status (p=0.001). Respondents from urban areas and those with sufficient and able-to-save income reported higher knowledge scores. Many studies have demonstrated differences in osteoporosis knowledge between urban and rural residents [13,18,23]. This finding could be due to women of higher income, and urban residents might have greater access to health information through healthcare providers or the internet. The present study revealed a significant difference in the level of knowledge about osteoporosis among different marital statuses (p= 0.008); single women had the highest level of good knowledge. This could be since single women have fewer responsibilities; hence, they have more time to learn and develop their knowledge. This result is inconsistent with the results of other studies that found a non-significant difference in osteoporosis knowledge regarding marital status [13,18,20]. An

individual's action is determined by a complex interaction of knowledge and health beliefs, in addition to socioeconomic determinants [24]. In this study, participants perceived a low susceptibility to osteoporosis. This result is compatible with the findings of other studies that identified low levels of perceived osteoporosis susceptibility among healthy women [18,20,23,25]. Participants in this study do not recognize themselves as susceptible to osteoporosis due to a shortage of osteoporosis knowledge among them. A statistically significant positive relationship was found between knowledge and perceived susceptibility to osteoporosis (r=0.25, p<0.001), so enhancing awareness toward osteoporosis risk factors is of greater importance in increasing perceived susceptibility to osteoporosis in women, which could help in the prevention of osteoporosis. Respondents in this study demonstrated a moderate perceived seriousness score. Other studies conducted in Malaysia, Africa, Egypt, and the United States reported close results [20,23,25,26]. In contrast, another study conducted in Peru among female community leaders reported a low perceived seriousness of osteoporosis, equal to 13.3±3.1 [27]. The findings of this study demonstrated a non-significant relationship between the perceived seriousness of osteoporosis and knowledge (r=0.01, p=0.836), this is comparable to that reported by Chan *et al*. (2019) [20], whereas it's contrary to the findings of Mortada *et al*. (2020) [18], who demonstrated a statistically significant positive correlation between perceived seriousness and knowledge toward osteoporosis. Women in the current study perceived nutritional calcium intake, and exercise as beneficial for osteoporosis prevention. Similarly, close perceived calcium and exercise beneficiary scores were reported by other studies [20,23,25,27]. Current results showed a significant positive relationship between the perceived benefits of calcium intake (r=0.19, p<0.001), and the benefits of exercise with knowledge score (r=0.36, p<0.001). This is in agreement with the findings of other researchers [20,25,26]. In contrast, Mortada *et al*. reported a non-significant correlation between knowledge and perceiving the benefits of calcium intake and exercise [18]. The mean score for perceived barriers to calcium intake and exercise among our participants was average. Likewise, previous studies demonstrated a moderate perception of barriers to calcium intake and exercise among participants [20,25]. Contradictory to this, other studies indicated a low perception of barriers to calcium intake and exercise [23,26,27]. Statistical analysis revealed a significant negative correlation between perceived barriers to calcium intake and exercise and knowledge score (r= - 0.27, p<0.001), this result is compatible with the findings of others [20,25,]. Although Murtada *et al*. reported a non-significant negative relationship between knowledge and barriers to calcium intake, surprisingly, they found a highly significant positive correlation between barriers to exercise and an increasing knowledge score [18]. A high level of health motivation is a critical initiation for the integration of an osteoporosis prevention program. Fortunately, women in this study felt high health motivation. The results also showed that knowledge score was significantly positively correlated with health motivations (r= 0.30, p<0.001, these results were consistent with those shown by earlier studies [20,23,25,26]. Reasonably, health beliefs are dependent on an individual's perception of a medical problem. Though an increase in the level of knowledge could improve perception, an individual's perception of his or her health status influences his or her health behaviors, so improving health beliefs is likely to be effective in modifying the person's lifestyle [28]. This was supported by the present results, which show that women's knowledge of osteoporosis is significantly correlated with all osteoporosis health beliefs. The most important limitation of this study is the nonprobability sampling technique, which limited the generalization of the findings. Another limitation is the cross-sectional design of this study, which allows only testing the association and not causality between knowledge, beliefs, and their associated factors. However, to our knowledge, this is the first study done in Iraq that used a valid and reliable tool to estimate the level of knowledge and beliefs toward osteoporosis in women.

Conclusion

The findings of this study indicated that participants had inadequate knowledge and average beliefs concerning osteoporosis. Age, gender, marital status, education, occupation, housing, and socioeconomic situation all play a role in overall osteoporosis knowledge. Knowledge about osteoporosis is positively related to perceived vulnerability, the advantages of both calcium intake and activity, and health motivation, but it is adversely related to both calcium and exercise barriers. As a result, osteoporosis education programs for the general public are advised.

Conflicts of interest

There are no conflicts of interest.

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Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

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