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# Knowledge, Attitude and Practices towards Osteoporosis Prevention among Adults in Kuala Lumpur, Malaysia

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## ABSTRACT

**Introduction**: Osteoporosis is a major health problem worldwide. In Asia, few studies have measured knowledge, attitude and practices (KAP) of osteoporosis. This study aimed to determine the KAP of osteoporosis, including the main factors influencing attitude towards osteoporosis, and the relationship between osteoporosis knowledge, attitude, and practices among adults in Kuala Lumpur, Malaysia. **Methods**: A cross-sectional study via a self-administrated KAP questionnaire was carried out among 232 respondents aged 21 to 50 years in Kuala Lumpur. Random sampling was applied to select five districts in Kuala Lumpur, while convenient sampling was used for recruitment of apparently healthy subjects from community and institutional settings. The data were analysed using Mann-Whitney, Kruskal-Wallis, Chi-Square, Spearman Correlation and multiple logistic regression tests. **Results**: The findings indicate a moderate level of knowledge and attitude towards osteoporosis prevention with median scores of 51.6% and 68.6%, respectively. Osteoporosis knowledge varied significantly with gender, educational level and household income ($p<0.05$). Furthermore, attitude was significantly different in relation to educational level and household income. Based on the multiple logistic regression test, relatives and friends appeared to be the most significant factor influencing attitude (R=0.319, $p<0.0001$). Poor dietary and lifestyles practices were indicated, and a significant relationship was found between practice of weight-bearing activities and educational level ($p<0.05$). A significant correlation was found ($\rho=0.348$, $p<0.0001$) between knowledge and attitude, while no relationship was noted between knowledge and practice of weight-bearing activities or attitude and practice of weight-bearing activities. **Conclusion**: Knowledge played a significant role in affecting attitudes towards osteoporosis. However, understanding of osteoporosis is still at a moderate level. Friends and family were the most influential factor.

**Key words**: Adults, attitude, knowledge, osteoporosis, practices

## INTRODUCTION

An increasingly aging population means that osteoporosis affects millions of people in the world, particularly in Asia and Latin America (Hossien, Tork & El-Sabeely, 2014; Kaur, 2013). Osteoporosis is defined by the National Institutes of Health (NIH) (2009) as a skeletal disease characterised by loss of bone mass, deterioration of bone structure, and micro-architectural deterioration of bone tissue, leading to bone fragility and fractures. It commonly occurs in the hip, spine, and wrist (World Health Organization (WHO), 1994] and is known as a "silent killer," as there may be no symptoms for the loss of bone mass.

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The disease progresses slowly and may only be realised after the occurrence of bone fractures (National Osteoporosis Foundation, 2007). Osteoporosis can be caused by modifiable risk factors such as a sedentary lifestyle and an imbalanced diet, as well as non-modifiable risk factors such as sex, ageing and family history (Kaur, 2013).

Osteoporosis has become a major public health problem. Poor knowledge and practices related to osteoporosis have been noted worldwide (De Silva *et al.*, 2014). Treatments are more prevalent than prevention in incidences of osteoporosis. These treatments may be harmful, especially when the disease is treated with drugs. Dietary calcium intake worldwide remains low. In Malaysia, there is a lack of recent studies on calcium consumption. The recommendation for calcium intake for Malaysia is 1000 mg/day (NCCFN, 2017).

Osteoporosis is commonly believed to be a problem only among the elderly. In reality, causes of osteoporosis include both internal and external forces in adulthood (Stetzer, 2011). Knowledge of osteoporosis contributes to the success of preventive efforts and may relate to dietary as well as lifestyle practices (Patil-Sapna *et al*., 2010). Studies on knowledge and practices related to osteoporosis have revealed that poor osteoporosis knowledge may be associated with the low intake of dietary calcium as well as lifestyle practices (Barzanji, Alamri & Mohamed, 2013; El-Sayed & Abdel Megeid, 2013). Previous studies report a positive attitude towards osteoporosis in some countries (Puttapitakpong *et al*., 2014; Alshammari, 2014; Fayazi *et al*., (2013). A number of studies also reveal that the dietary and lifestyle practices towards osteoporosis prevention remain low, even though there is a positive attitude among the populations studied (Puttapitakpong *et al*., 2014). A small proportion of the population meets the daily recommendation of calcium intake to prevent osteoporosis. It has been found that many people have unhealthy lifestyle practices such as smoking and drinking of alcohol, which can cause osteoporosis (Puttapitakpong *et al*., 2014).

Recently, there has been a steady increase in the number of studies evaluating knowledge, attitude and practices towards osteoporosis in different countries (Al-Otaibi, 2015; Alshammari, 2014; De Silva *et al*., 2014; El-Said Hossien *et al*., 2014; Fayazi *et al*. (2013). However, the target group in these studies involved women who were suffering from osteoporosis or at the risk of having osteoporosis, including female adolescents (El-Said Hossien *et al*., 2014), medical students (De Silva *et al*., 2014) and health care physicians and pediatricians (Saeedi *et al*., 2014). Only a few studies have been carried out among adults in Asian countries on knowledge, attitude, and practices related to osteoporosis. To date, there has been no published study on the knowledge, attitude, and practices related to osteoporosis among Malaysian adults. The present study was carried out to determine levels of osteoporosis knowledge and attitudes, and to assess the dietary and lifestyle practices related to osteoporosis among adults. Furthermore, the most significant factor influencing attitude towards osteoporosis among adults in Kuala Lumpur was determined and the relationships between knowledge, attitudes, and practices related to osteoporosis were also studied.

## METHODS

### Research design

A cross-sectional study was carried out in five out of eleven districts in Kuala Lumpur, namely Titiwangsa, Batu, Kepong, Segambut and Cheras selected through simple random sampling in 2015. Convenient sampling was used for recruitment of apparently healthy subjects from community and institutional settings.

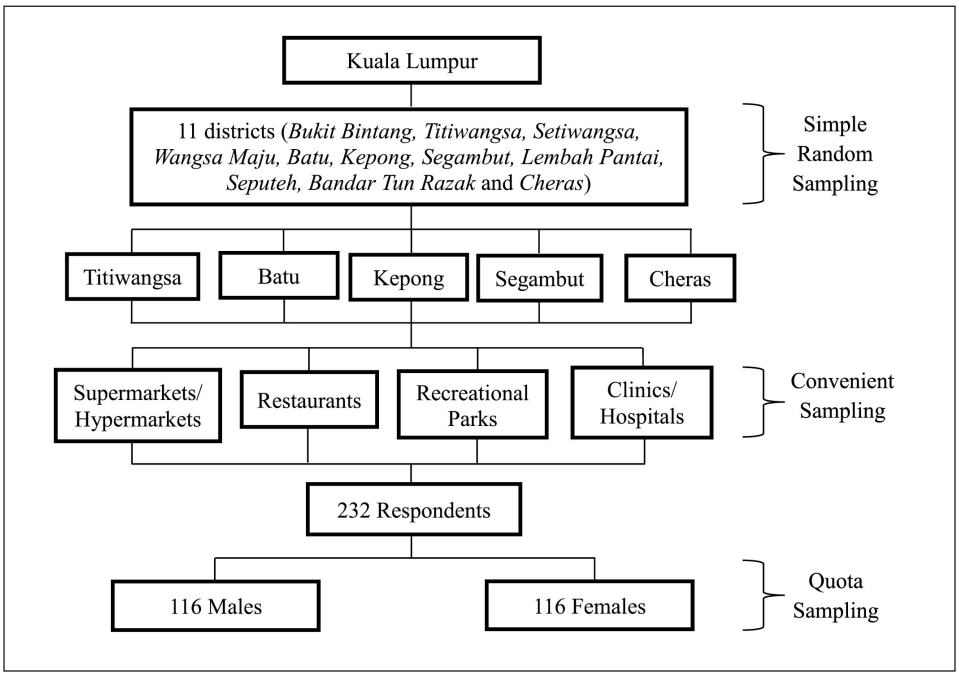


**Figure 1.** Sampling frame of the study

Sample size was calculated based on a confidence level of 95% and precision was assumed to be 0.5. Thus, a total of 232 adults, comprising 116 males and 116 females, were recruited as shown in Figure 1.

This study was approved by the Institute for Health Behavioral Research (IHBR) and Medical Research & Ethics Committee (MREC) under the Ministry of Health Malaysia with the registration number being NMRR-15-778-25417 (IIR). Consent forms were also signed and collected from all study participants.

**Research instrument**

A self-administered questionnaire was used as the research instrument in the present study. This questionnaire had five sections: socio-demographic profile, information on health status, osteoporosis knowledge, attitude towards osteoporosis, and diet/life style practices. The scores on knowledge and attitude towards osteoporosis were summed up and categorised into low (less than or equal to 50%), moderate (51 to 69%) and high (70% and above) (Khan *et al.*, 2014). The reliability of the questionnaire was tested through a pilot test to determine the consistency of rating and correlation between each individual test items in the questionnaire (Labbe, 2011). Using inter-item reliability, the consistency of the items was tested and the overall Cronbach's alpha of the items in the questionnaire was found to be greater than 0.7, which indicates good reliability. Construct validity is used to determine whether the research design measures what is required to measure correctly and the veracity of the research results (Joppe, 2000). The questionnaire for the present study was a modification of published questionnaires of related studies (Mercola, 2014; Yanto, 2014; El-Sayed & Abdel Megeid, 2013; Khan, 2012; Global Adult

Tobacco Survey Collaborative Group, 2011). Revisions were made based on the results of a pilot test and feedback from a group of reviewers in the field of nutrition.

**Data analysis**

The data were analysed using SPSS version 20. The Kolmogorov-Smirnov Test was used to determine the normality of the data. Descriptive tests were used to analyse the socio-demographic profiles, osteoporosis knowledge, attitudes, and practice scores of the respondents. Mann-Whitney and Kruskal-Wallis tests were used to compare the median of osteoporosis knowledge and attitude, while the chi-square test was used to determine the distribution of practice of weight-bearing activity and to examine the relationship between attitude and practice of weight-bearing activity towards osteoporosis. Correlation was determined between the strength of the relationship between osteoporosis knowledge and attitude. Multiple logistic regression identified the most significant factors influencing attitude towards osteoporosis among adults in Kuala Lumpur.

## RESULTS

**Socio-demographic data**

A majority of respondents were single. The education profile shows that most of the respondents were degree holders. In terms of occupation, many respondents were service and sales workers. Furthermore, most respondents had a monthly income of RM 1500 to RM 2999, and only a minority of the respondents had a total household income of more than RM 8000 in a month as shown in Table 1. Osteoporosis awareness of the adults in Kuala Lumpur was high, as a majority of the respondents (74.1%) had heard about osteoporosis, while 24.6% of respondents had not heard about osteoporosis and 2.3% were confused about osteoporosis. The most popular source of information about osteoporosis was television (30.7%), followed by the internet (23.7%) and newspapers (20.4%).

**Knowledge and attitude towards osteoporosis**

A majority of the respondents scored low levels, and only 12.5% had a high level of osteoporosis knowledge. The overall results indicate that the respondents' osteoporosis knowledge was considerably moderate, as the median score was 51.6% as shown in Table 2. The present study indicates that most respondents (78.9%) knew about the symptoms of osteoporosis and about calcium-rich foods, and were also aware that an individual should exercise three or more days a week for about 20 to 30 minutes in order to prevent osteoporosis. However, the majority (75.8%) were not aware that osteoporosis can indirectly cause death, that fizzy beverages or coffee can be harmful to the bones, and that vitamin D is recommended for osteoporosis prevention. Most respondents were also unaware of the recommended amount of calcium intake for an adult or the best way to prevent osteoporosis. As shown in Table 2, almost half (49.6%) had a high attitude which means a good or positive attitude based on attitude score (%), whereas low implies bad/negative attitudes towards osteoporosis prevention. Overall, the attitude of the respondents towards osteoporosis was considerably moderate as the median score was 68.6%. It was found that relatives, friends, and education ($R=0.294$, $p<0.001$) had a significant effect on influencing their attitude towards osteoporosis prevention. Of these two factors, relatives and friends was the factor ($R=0.319$, $p<0.001$) that significantly influenced attitude towards osteoporosis among adults in Kuala Lumpur.

**Osteoporosis practices**

Based on the food frequency questionnaire, green leafy vegetables had the highest

**Table 1.** Demographic characteristics of the respondents

| *Characteristics* | *Number of respondents (n=232)* | *Percentage (%)* |
|---|---|---|
| Age | | |
| 21 – 25 | 50 | 21.6 |
| 26 – 30 | 65 | 28.0 |
| 31 – 35 | 34 | 14.7 |
| 36 – 40 | 30 | 12.9 |
| 41 – 45 | 29 | 12.5 |
| 46 – 50 | 24 | 10.3 |
| Gender | | |
| Male | 116 | 50.0 |
| Female | 116 | 50.0 |
| Race | | |
| Malay | 77 | 33.2 |
| Chinese | 81 | 34.9 |
| Indian | 74 | 31.9 |
| Single | 124 | 53.4 |
| Married | 42 | 18.1 |
| Married with children | 66 | 28.4 |
| Education Level | | |
| PMR/ SPM or lower | 72 | 31.0 |
| Diploma/ STPM | 62 | 26.7 |
| Degree | 76 | 32.8 |
| Master/ PhD | 15 | 6.5 |
| Others | 7 | 3.0 |
| Occupation | | |
| Manager | 27 | 11.6 |
| Professional | 46 | 19.8 |
| Technician andassociate professional | 33 | 14.2 |
| Service and sales worker | 52 | 22.4 |
| Self-employed or own business | 27 | 11.6 |
| Not working or housewife | 20 | 8.6 |
| Student | 25 | 10.8 |
| Others | 2 | 0.9 |
| Household Income | | |
| Less than RM 1499 | 22 | 9.5 |
| RM 1500 – RM 2999 | 49 | 21.1 |
| RM 3000 – RM 3999 | 30 | 12.9 |
| RM 4000 – RM 4999 | 29 | 12.5 |
| RM 5000 – RM 5999 | 39 | 16.8 |
| RM 6000 – RM 6999 | 23 | 9.9 |
| RM 7000 – RM 7999 | 20 | 8.6 |
| More than RM 8000 | 20 | 8.6 |

**Table 2.** Level of osteoporosis knowledge and attitude towards osteoporosis

| *Aspect* | *Number of Respondents (n = 232)* | *Percentage (%)* | *Median (25th, 75th percentile)* |
|---|---|---|---|
| Osteoporosis Knowledge | | | |
| Low (0 – 48.4%) | 112 | 48.3 | 51.6 |
| Moderate (51.6 – 67.7%) | 91 | 39.2 | (41.9, 64.5) |
| High (71.0 – 87.1%) | 29 | 12.5 | |
| Attitude towards Osteoporosis | | | |
| Low (44.3 – 50.0%) | 10 | 4.3 | 68.6 |
| Moderate (51.4 – 68.6%) | 107 | 46.1 | (62.9, 74.3) |
| High ( 70.0 – 87.1%) | 115 | 49.6 | |

Low: 0 – 50%; Moderate: 51 – 69%; High: 70% and above

FFQ score (75.6%) among all selected foods, under the category of moderate consumption. The consumption of garlic and eggs was considered as moderate, as the total FFQ scores were 69.0% and 65.3%, respectively. The consumption of milk and dairy products, soybean products, canned salmon and sardines, broccoli, cabbage, okra, cucumber and celery, dates, dried apricots, grapefruit, oranges and tangerines, prunes, mulberries, kiwi, guava, almonds, calcium-fortified breakfast cereals, fortified orange juice, chocolate and cocoa products, cola beverages and coffee was low (<60%). All the selected food items in this FFQ section, except for coffee and cola beverages, were calcium-rich foods. The consumption of calcium-rich foods among the adult population was low, as shown by the score obtained (<60%) for most of the food items.

Their self-reported claims indicated that 81% participated in daily weight-bearing activities. However, the level of weight-bearing activities was low, as many of them did not report exercising for a period of more than 90 min in a week. Results showed that badminton was the most common activity practised by the respondents. However, it is not the best weight-bearing activity to prevent osteoporosis compared to exercise such as brisk walking. Though many respondents reported walking briskly, they spent less than 30 min in a week for brisk walking (27.2%). The present study revealed that 25.0% respondents maintained that they jogged for 30 to 90 min a week, while 22.8% said they jogged for less than 30 min a week. Overall, the practice of weight-bearing activities was low among adults in Kuala Lumpur.

**Comparison of socio-demographic factors on knowledge, attitude, and practice**

In terms of osteoporosis knowledge, significant differences ($p$<0.05) were found across gender, education level, and household income (Table 3). No significant difference ($p$>0.05) was identified for attitudes towards osteoporosis in terms of gender and race, while attitude towards osteoporosis was significantly different across the education level and household income (p<0.05), as shown in Table 4. The practice of weight-bearing activities was only found to be significant across the education level with no significant difference between gender, ethnicity, and household income as shown in Table 5.

**Relationship between knowledge, attitude, and practice of weight-bearing activities towards osteoporosis**

There was a significant correlation between knowledge and attitude towards

**Table 3.** Comparison of osteoporosis knowledge and socio-demographic factors

| *Characteristics* | *Osteoporosis Knowledge Score (%)* | *Sig.* |
|---|---|---|
| | *Median (25th, 75th percentile)* | |
| Gender | | p = 0.002* |
| Male | 48.4 (38.7, 64.5) | |
| Female | 54.8 (45.2, 64.5) | |
| Races | | p = 0.136 |
| Malay | 54.8(41.9, 67.7) | |
| Chinese | 48.4 (40.3, 62.9) | |
| Indian | 51.6(45.2, 62.1) | |
| Educational level | | p = 0.000** |
| Low | [c]45.2 (35.5, 49.2) | |
| Moderate | [b]54.8 (45.2, 64.5) | |
| High | [a]64.5 (58.1, 77.4) | |
| Household income | | |
| Low | 48.4 (35.5, 54.8) | p = 0.000** |
| Moderate | [b]48.4 (41.9, 61.3) | |
| High | [a]61.3 (48.4, 71.0) | |

*$p < 0.05$ indicates significant difference by Mann-Whitney Test.**$p < 0.05$ indicates significant difference by Kruskal-Wallis Test.
Letters with superscript [a], [b] and [c] indicate a significant difference in the median score of osteoporosis knowledge by Kruskal-Wallis Test

**Table 4.** Gender differences on attitude towards osteoporosis

| *Characteristics* | *Osteoporosis attitude score (%)* | *Sig.* |
|---|---|---|
| | *Median (25th, 75th percentile)* | |
| Gender | | p = 0.751 |
| Male | 68.6 (62.9, 74.3) | |
| Female | 70.0 (62.9, 74.3) | |
| Races | | p = 0.708 |
| Malay | 70.0 (64.3, 74.3) | |
| Chinese | 70.0 (61.4, 74.3) | |
| Indian | 67.9 (62.9, 74.3) | |
| Educational level | | p = 0.007** |
| Low | [ab]67.1 (61.1, 72.9) | |
| Moderate | [b]70.0 (62.9, 74.3) | |
| High | [a]77.1 (65.7, 81.4) | |
| Household income | | p = 0.010* |
| Low | [b]67.1 (61.8, 71.4) | |
| Moderate | [a]70.0 (62.9, 74.3) | |
| High | [ab]71.4 (62.9, 77.1) | |

*$p < 0.05$ indicates significant difference by Mann-Whitney Test.**$p < 0.05$ indicates significant difference by Kruskal-Wallis Test.
Letters with superscript [a], [b] and [c] indicate a significant difference in the median score of osteoporosis knowledge by Kruskal-Wallis Test

**Table 5.** Practice of weight-bearing activities towards osteoporosis between gender, race and educational level

| *Characteristics* | *Practise of weight bearing* | | *Pearson Chi-square* | |
|---|---|---|---|---|
| | *Yes* | *No* | $\chi 2$ | *p value* |
| Gender | | | 0.112 | 0.738 |
| Male | 95 | 21 | | |
| Female | 93 | 23 | | |
| Races | | | 0.945 | 0.623 |
| Malay | 65 | 12 | | |
| Chinese | 65 | 16 | | |
| Indian | 58 | 16 | | |
| Educational level | | | 7.254 | 0.027* |
| Low | 57 | 21 | | |
| Moderate | 116 | 23 | | |
| High | 15 | 0 | | |

*$p < 0.05$ indicates significant difference by Chi-Square Test.

osteoporosis (rho=0.348, $p<0.0001$). However, no significant relationship was found between knowledge and practice of weight-bearing activities towards osteoporosis. There was no significant relationship between attitude and practice of weight-bearing activities towards osteoporosis ($p>0.05$).

## DISCUSSION

In this study, television was recognised as the primary source of information for osteoporosis, similar to results reported by Safizadeh, Aminizadeh & Safizadeh (2015) and Barzanji *et al. (*2013). A moderate level of osteoporosis knowledge was found, contradicting studies conducted by De Silva *et al.* (2014), Barzanji *et al*. (2013), Fenech *et al.* (2011) and Riaz *et al.*(2008) who reported a low level of osteoporosis knowledge among the studied population. The difference in results can be explained as the populations involved in previous studies were new medical entrants and unemployed with limited knowledge on osteoporosis. The present study results also contradict those of Puttapitakpong *et al.*(2014), Khan *et al.*(2014) and Saeedi *et al.*(2014) who reported high levels of osteoporosis knowledge among the studied populations. This may be because the populations involved in those studies were highly-educated and had been exposed to osteoporosis knowledge for a long period of time. Some respondents were also unable to recognise that smoking, small body frame, heredity, menopause, medications, and medical problems can also cause a loss of bone density, leading to osteoporosis. However, our findings are in agreement with another study conducted by El-Sayed & Abdul Megeid (2013).

The findings in the present study are similar to that of Puttapitakpong *et al*. (2014), who reported that most Thai women aged 20 to 35 (53.3%) had a positive attitude towards osteoporosis prevention. Alshammari (2014) also revealed that about 80.2% of the women in Saudi Arabia and 78.6% of the Iranian adults, respectively, had demonstrated a positive attitude. Another study done in Malaysia among undergraduate students also reported similar findings, in which about 77.1% of the students had a positive attitude (Wan Jamil *et al.*, 2010).

Many studies have claimed a high positive attitude towards osteoporosis

(Puttapitakong *et al.,* 2014; Alshammari, 2014). According to Khan *et al.* (2014), a low and negative attitude and perceived susceptibility of osteoporosis in the community may be associated with a lack of perceived awareness of osteoporosis.

However, self-efficacy and self-motivation, which are not studied in the present study, can also affect attitudes towards osteoporosis (Ford *et al.,* 2011). Self-efficacy is the determination that an individual has to start osteoporosis prevention (Khorsandi, Hasazadeh & Ghobadzadeh, 2012). It is always associated with attitude, as it contributes to motivation and positive thinking to implement the changes. On the other hand, individuals will have a positive attitude to prevent osteoporosis when they have the motivation to create and implement the proper changes in lifestyles or physical activities (Jeihooni *et al.,* 2014). Self-motivation has also been pointed out for its important role in working together with self-regulation in order to show a positive attitude towards osteoporosis prevention (Trudel & Murray, 2012)

A low score for dietary practice was found in this study, consistent with the findings of De Silva *et al.* (2014) who reported low dietary practices among female medical school entrants in Sri Lanka. Similarly, Naghashpour *et al.* (2014) and Fayazi *et al.* (2013) also reported low calcium consumption among female students. The low consumption of calcium-rich foods can be related to lack of knowledge of the sources of calcium and the daily calcium recommendation for an adult.

In terms of practices on weight bearing activities, the findings were similar to findings by Alshammari (2014), who reported low scores for practices related to osteoporosis and found that only 42.8% of women in Saudi Arabia successfully exercised. The findings of the present study are also in agreement with those of De Silva *et al.* (2014), who reported low levels of osteoporosis prevention activities, with only 13.6% women in Sri Lanka engaging in the recommended exercises.

Low practice of weight-bearing activities may also be related to a busy lifestyle. The respondents involved in the present study were adults aged 21 to 50, and a majority were working individuals busy with their working life. Lack of time has become a reason for the short duration of exercise. Additionally, a lack of knowledge about weight-bearing activities can also explain the low practice of weight-bearing activities among the studied population. Body mobility impairments and diseases can contribute to lower practices of weight-bearing activities as well.

The findings across gender, education level and household income in the present study are similar to those of Khan *et al.* (2014), Yeap, Goh & Das Gupta (2010) and Kim *et al.* (2015). Our study findings that socio-demographic factors do not have a significant effect on attitude to osteoporosis is supported by several studies (Barzanji *et al.*, 2013; Khan *et al.,* 2014; Puttapitakpong *et al.,* 2014; Alshammari, 2014; Kim *et al.*, 2015). In terms of weight bearing activities, the present findings are in contrast to a previous study (Khan *et al.*, 2014) which reported no significant difference between educational level and physical activities towards osteoporosis prevention. This may be because attitude and other factors can also cause the low practice of physical activities among a highly-educated population. The findings are also in contrast to those of Barzanji *et al.* (2013) who stated that men were more physically active than women in exercising for more than 90 min. The active involvement of men in weight-bearing activities may be related to employment status, as some women were not working or were housewives. In addition, the findings are in contrast to those of Kim *et al.* (2015) who claimed that a low level of household income was

significantly associated with low practices towards osteoporosis prevention. As limited data has been obtained, further studies must be done to determine comparable findings.

The findings of the present study are similar to a study done by Puttapitakpong *et al.* (2014) and Alshammari (2014), in which a significant correlation was found between knowledge and attitude towards osteoporosis. Puttapitakpong *et al.* (2014) demonstrated that highly educated women with adequate osteoporosis knowledge tend to have a positive attitude towards osteoporosis. In a study done by Alshammari (2014), osteoporosis knowledge among working women was significantly correlated to attitude. Khan *et al.* (2014) reported a significant weak positive correlation between knowledge and attitude among university students in Malaysia.

The results show that osteoporosis knowledge is significantly correlated with attitude. This indicates that attention and preventive measures are concerned with osteoporosis, as supported by Alshammari (2014). According to Albarracin, Johnson & Zanna (2014), knowledge may activate attitude and bias processing. It can also influence individuals who have information on attitude to be more recognisable towards the application of attitude to a persuasive message. Knowledge may also affect one's willingness to apply the attitude on the issue faced. This might relate to the significant correlation between knowledge and attitude towards osteoporosis observed in the present study.

A majority of the respondents were young adults who possessed confidence in their ability to perform weight-bearing activities daily. The high level of practice of weight-bearing activities towards osteoporosis has been speculated to be unrelated to the level of osteoporosis knowledge, but might be related to other factors such as weight loss and social acceptability.

The findings obtained in the present study are consistent with those of Khan *et al.* (2014) which found no significant relationship between attitude and practice of weight-bearing activities towards osteoporosis. It may be concluded that attitude has no significant effect on the practice of weight-bearing activities among adults in Kuala Lumpur. There are other physiological and environmental factors that can influence healthy lifestyles towards practising weight-bearing activities to prevent osteoporosis.

## CONCLUSION

The present study shows a moderate level of knowledge on osteoporosis among adults in Kuala Lumpur. Knowledge plays a significant role in affecting attitudes towards osteoporosis. Relatives and friends significantly affect attitude towards osteoporosis. Public health strategies which aim at improving the calcium intake of adults and changing lifestyle practices, such as increasing the physical weight-bearing activities, should be developed.

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