ASSESSMENT OF KNOWLEDGE, BELIEF AND SELF-EFFICACY REGARDING OSTEOPOROSIS AMONG FEMALE ACADEMICIAN IN MALAYSIA

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Abstract: Osteoporosis does not only causes increase economic burden, it also leads to social, physical and psychological consequences. The incidence of osteoporosis has been increasing particularly due to increase in life expectancy of general population which affects women to a greater extent than men. Despite of availability treatment for osteoporosis, prevention is still preferable to combat this disease. A good knowledge and awareness of a disease are pre-requisites for the success of preventive measures, modifications in life styles and treatment adherence. This cross-sectional study was conducted with the purpose of assessing the level of knowledge, belief and self-efficacy regarding osteoporosis among female academician in a public university in Malaysia. Total 212 respondents were agreed to participate. Data was collection by a structured questionnaire consisting of Osteoporosis Knowledge Test (OKT); Osteoporosis Health Belief Scale (OHBS); Osteoporosis Self-Efficacy Scale (OSES). Participants had low level of knowledge on osteoporosis; low level of belief of susceptibility but higher self-efficacy. Public wakefulness of osteoporosis remains low, health education is effective in improving awareness among female which can be one of the best choices for increasing knowledge of osteoporosis and inducing behavioral change in the period of peak bone density.

Keywords: Osteoporosis, Knowledge, Belief, Self-efficacy, Malaysia.

I. INTRODUCTION

Osteoporosis is a chronic disorder of bone which is characterized by low bone mineral density, distortion of bone architecture. It causes severe pain and fragility fracture due to low bone mass. Globally it is an alarming health issue due severe economic burden leads to social, physical and mental trauma [1]. Annually worldwide 8.9 million fractures occur, resulting in an osteoporotic fragility fracture in every 3 seconds [2]. Fragility fracture increasing rapidly in developing and Asian countries including Malaysia [3].

Osteoporosis is common in both gender, but 80% cases affects women[4]. So, primary prevention strategies should target women [5]. Women employees who are involved with sedentary work for long term especially is very prone to develop low peak bone mass which is independent risk factor for osteoporosis. This current study was conducted with the purpose of assessing the level of knowledge, belief and self-efficacy regarding osteoporosis.

II. METHODS AND MATERIALS

A cross sectional study was conducted among female academician (age 25-55 years) in a public university in Malaysia. A multistage random sampling was used. Total 212 respondents were agreed to participate and response rate was 42%. A structured questionnaire was used for data collection (November 2016 – January 2017) which was consists of three scales; Osteoporosis Knowledge Test (OKT); Osteoporosis Health Belief Scale (OHBS); Osteoporosis Self-Efficacy Scale

(OSES). Permission of modification was taken from the original author [6-7] and pre-test was done to validate by factor analysis (Eigen value OKT=4.6; OHBS=4.09; OSES=4.06) and Cronbach's alpha coefficient (OKT=0.95; OHBS=0.91; OSES=0.85). Data analysis was conducted using Statistical Package for Social Sciences (version 20). This research project has been granted ethical approval from the Ethical Review Board of Universiti Putra Malaysia. Informed consent obtained from each respondent prior to data collection.

III. RESULTS

A. Osteoporosis Knowledge Test:

Table I, the participant was to decide if the statement would affect a person's chance of becoming at risk factors for osteoporosis. Table II represents three items for the osteoporosis knowledge test which were also common in both nutrition and exercise subscale regarding osteoporosis screening, treatment, and bone development.

Table I: OSTEOPOROSIS KNOWLEDGE TEST FOR RISK FACTORS (N = 212)

Items	More Likely ML (%)	Neutral NT (%)	Less Likely LL (%)	Don't Know DK (%)
Eating a diet LOW in dairy products	**(81.1)**	8.1	7.1	3.7
Being woman with fair skin (less melanin pigmentation)	(22.2)	**38.4**	14.6	24.8
Being overweight	**38.9**	32.4	(9.5)	19.2
Having an eating disorder	(6.3)	23.5	16.9	**53.3**
Having ovaries surgically removed	(15.2)	**34.3**	17.8	32.7
Taking cortisone (steroids: Prednisone) for long time	**(47.0)**	9.1	15.4	28.5
Being menopausal	(23.6)	14.4	12.8	**49.2**
Having a mother or grandmother who has osteoporosis	(8.7)	10.9	10.7	**69.7**
Note: Correct responses are in parentheses. Most frequent responses are bolded.				

Table II: OSTEOPOROSIS KNOWLEDGE TEST FOR SCREENING, TREATMENT, AND BONE DEVELOPMENT (N = 212)

Items	Childhood	Adolescent	Young adulthood	Don't know
When is the best time to build strong bones?	19.2	**(39.5)**	24.1	17.2
Osteoporosis can be diagnosed by	**73.2**	5.1	9.8	11.9
	There is nothing you can do about it	You can take medication to treat	You must be careful lifting objects	Don't know
Once you have osteoporosis	2.1	21.2	13.0	**63.7**
Note: Correct responses are in parentheses. Most frequent responses are bolded.				

Table III presents the responses for osteoporosis knowledge of exercise. Correctly, participants identified jogging/running for exercise (39.8 %) and aerobic dancing (44.2 %) as physical activity which reduces chances of osteoporosis. Table IV presents the responses for osteoporosis knowledge of nutritional factors.

TABLE III: OSTEOPOROSIS KNOWLEDGE TEST FOR EXERCISE (N = 212)

Items	Answer option (one best answer from the 4 choices)			
How many days a week do you think a person should exercise to strengthen the bones?	3 days a week	4 days a week	5 or more days a week	Don't Know
	27.2	12.8	(44.3)	15.7
What is the least amount of time a person should exercise on each occasion to strengthen the bones?	Less than 15 minutes	20 to 30 minutes	More than 45 minutes	Don't Know
	16.5	(55.6)	23.2	4.7
Exercise makes bones strong, but exercise must be fast enough to produce fast breathing.	Just a little faster	So, fast that talking is not possible	Much faster, but talking is possible	Don't Know
	47.2	27.7	(11.5)	13.6

Which of the following exercises reduce a person's chance of getting osteoporosis?	Swimming	Walking briskly	Stretching	Don't know
	38.2	(29.8)	27.9	4.1
Which of the following exercises reduce a person's chance of getting osteoporosis?	Bicycling	Yoga	Lifting weights	Don't know
	61.2	12.6	(16.9)	9.3
Which of the following exercises reduce a person's chance of getting osteoporosis?	Jogging or running	Golfing using golf cart	Gardening	Don't know
	(39.8)	25.4	21.6	13.2
Which of the following exercises reduce a person's chance of getting osteoporosis?	Bowling	Doing laundry	Aerobic dancing	Don't know
	22.7	19.5	(44.2)	13.6
Note: Correct responses are in parentheses. Most frequent responses are bolded.				

TABLE IV: OSTEOPOROSIS KNOWLEDGE TEST FOR NUTRITION (N = 212)

Items	Answer option (one best answer from the 4 choices)			
Which of the following is the best source of calcium?	Apple	Cheese	Cucumber	Don't Know
	13.8	(71.6)	1.9	12.7
Which of the following is the best source of calcium?	Peanut Butter	Chicken	Canned Sardines	Don't Know
	14.9	69.6	(12.3)	3.2
Which of the following is the best source of calcium?	Corn	Broccoli	Grapes	Don't Know
	32.1	(47.2)	15.2	5.5
Which of the following is the best source of calcium?	Yogurt	Strawberries	Cabbage	Don't know
	(67.4)	17.9	13.5	1.2
Which of the following is the best source of calcium?	Ice cream	Raisins	Water melon	Don't know
	(41.2)	18.7	20.6	19.5
Which of the following is the recommended amount of calcium intake for an adult?	600-800 mg daily	1000-1200 mg daily	1400-1600 mg daily	Don't know
	40.1	(13.2)	16.6	30.1
How much milk must an adult drink to meet the recommended amount of calcium?	1 glass daily	2 glasses daily	3 or more glasses daily	Don't know
	37.4	45.6	(12.3)	4.9
Which of the following is the best reason for taking a calcium supplement?	If a person doesn't eat breakfast	If a person does not get enough calcium from diet	If a person is over 45 years old	Don't know
	12.3	(55.3)	18.9	13.5
Which vitamin is required for the absorption of calcium?	Vitamin A	Vitamin C	Vitamin D	Don't know
	14.2	19.8	(17.4)	48.6
Which is the best source of the vitamin required for the absorption of calcium?	Carrots	Oranges	Sunlight	Don't know
	18.1	11.4	(67.9)	2.6
Which is the best food source of the vitamin required for the absorption of calcium?	Spinach	Cheese	Egg yolks	Don't know
	4.9	71.2	(17.8)	6.1
Which of the following is the recommended amount of the vitamin required for the absorption of calcium for an adult, 50 years old and older?	800-1000 IU daily	1200-1400 IU daily	1600-1800 IU daily	Don't know
	(4.8)	7.5	11.9	77.4
Note: Correct responses are in parentheses. Most frequent responses are bolded.				

B. Osteoporosis Health Belief Scale:

Table V presents the response results to each statement comprising the Osteoporosis Health Belief Scale. The answers provided by the highest proportion of respondents are bolded for each of the statements.

TABLE V: OSTEOPOROSIS HEALTH BELIEF SCALE RESPONSE BY SUBSCALE CATEGORY (N=212)

		Level of Agreement (%)				
Statement		SD	D	N	A	SA
Susceptibility	chances of getting osteoporosis high	28.2	22.6	**31.2**	14.4	3.4
	body build likely to get osteoporosis	23.7	33.7	**27.5**	12.9	2.1
	extremely likely to get osteoporosis	30.3	**32.2**	28.5	6.9	2.1
	good chance will get osteoporosis	23.9	**33.2**	28.3	12.5	2.1
	more likely than average person to get osteoporosis	30.1	**36.2**	21.2	10.2	2.1
	family history makes it more likely will get osteoporosis	**35.4**	34.1	18.9	9.8	1.8
Seriousness	thought of having osteoporosis scares me	13.9	18.6	21.5	**33.5**	12.5
	if had osteoporosis would be crippled	20.2	**36.1**	25.9	14.4	3.0
	feeling about self would change if got osteoporosis	18.4	26.1	22.9	**27.8**	4.5
	would be costly if got osteoporosis	8.6	16.0	28.7	**35.5**	11.2
	when think about osteoporosis, get depressed	**31.8**	29.3	23.1	11.7	4.2
	would be serious if got osteoporosis	7.3	12.9	16.8	**45.3**	17.4
Benefits Exercise	regular exercise prevents problems of osteoporosis	4.7	7.8	14.3	**45.8**	27.1
	feel better when exercise to prevent osteoporosis	5.6	5.8	23.0	**41.7**	24.0
	regular exercise helps build strong bones	4.9	6.2	7.4	**43.1**	38.4
	exercise for osteoporosis also improves body looks	6.1	4.9	9.8	38.5	**40.4**
	regular exercise cuts down chances of broken bones	4.9	9.2	14.8	**44.8**	26.3
	feel good about self when exercise to prevent osteoporosis	4.2	5.6	20.8	**41.4**	27.9
Benefits Calcium Intake	taking enough calcium prevents risk of osteoporosis	3.9	9.1	17.0	**47.3**	22.6
	have lots to gain taking enough calcium to prevent osteoporosis	4.7	6.3	16.8	**47.3**	24.2
	taking enough calcium prevents painful osteoporosis	4.5	7.6	24.6	**45.5**	17.8
	wouldn't worry as much about osteoporosis if enough calcium	4.2	11.1	25.8	**43.6**	15.4
	taking enough calcium cuts chance of broken bones	3.5	6.8	15.2	**51.5**	22.9
	feel good about self when enough calcium to prevent osteoporosis	4.4	6.8	25.8	**44.7**	18.2
Barriers Exercise	feel like not strong enough to exercise regularly	**40.3**	28.7	10.6	12.2	8.2
	have no place where can exercise	**59.5**	25.6	7.1	5.7	2.1
	spouse/family discourage from exercising	**65.5**	18.4	7.1	5.9	2.1
	exercising regularly is new habit - hard to do	**35.5**	25.9	15.8	18.6	4.2
	exercising regularly makes uncomfortable	**45.6**	31.7	14.6	6.2	1.8
	exercising regularly upsets everyday routine	**40.0**	29.4	12.9	15.3	2.3
Barriers Calcium Intake	calcium rich foods cost too much	29.7	**34.1**	23.9	9.3	3.0
	calcium rich food doesn't agree with me	37.6	**33.7**	17.4	8.7	2.5
	do not like calcium rich foods	**40.5**	33.7	16.2	7.8	1.8
	eating calcium rich foods diet change-hard to do	30.2	**36.6**	19.2	11.5	2.4
	to eat more calcium foods, have to give up other I like	26.5	**36.2**	18.4	16.7	2.0
	calcium rich foods have too much cholesterol	17.6	33.1	**39.1**	7.8	2.1

Health Motivation	eat well balanced diet	9.8	23.7	28.8	**30.2**	7.4
	look for new information related to health	8.8	18.8	29.9	**33.8**	8.6
	keeping health is very important for me	4.2	6.9	15.4	**49.9**	23.5
	try to discover health problems early	4.2	8.7	27.3	**45.3**	14.5
	have regular health check-up even when not sick	12.2	**29.2**	26.3	23.1	9.2
	follow recommendations to keep me healthy	5.7	9.7	31.4	**42.4**	10.7
Note: Most frequent responses are bolded.						
SD= Strongly Disagree; D= Disagree; N=Neutral; A=Agree; SA=Strongly Agree						

C. Osteoporosis self-efficacy scale:

Table VI presents the response results to each statement comprising the Osteoporosis Self-Efficacy Scale. Participants expressed a high self-efficacy for both exercise experiences and calcium intake experiences.

TABLE VI: OSTEOPOROSIS SELF-EFFICACY SCALE (N= 212)

	Level of Agreement				
Statement	**SD (%)**	**D (%)**	**N (%)**	**A (%)**	**SA (%)**
Osteoporosis Self-Efficacy Exercise Scale					
begin a new or different exercise program	6.1	9.5	16.3	**43.7**	24.4
change your exercise habits	5.3	10.1	16.1	**47.8**	20.6
put forth the effort required to exercise	4.0	6.4	14.9	**48.9**	25.7
do exercises even if they are difficult	5.6	8.0	15.6	**45.8**	25.1
maintain a regular exercise program	4.2	7.9	17.8	**38.9**	31.2
exercise for the appropriate length of time	5.2	7.8	13.7	**48.5**	24.8
do exercises even if they are tiring	7.2	12.7	14.5	**36.4**	29.2
stick to your exercise program	3.6	11.8	18.2	**41.9**	24.5
exercise at least three times a week	8.2	8.7	9.7	**55.6**	17.8
do the type of exercises that you are supposed to do	4.9	7.0	13.1	**48.3**	26.7
Osteoporosis Self-Efficacy Calcium Scale					
begin to eat more calcium rich foods	8.4	7.8	18.7	**43.6**	21.5
increase your calcium intake	2.9	6.4	15.9	**52.6**	22.2
consume adequate amounts of calcium rich foods	3.1	9.8	11.2	**61.2**	14.7
eat calcium rich foods on a regular basis	4.8	7.4	9.5	**59.8**	18.5
change your diet to include more calcium rich foods	3.7	7.5	17.3	**51.8**	19.7
eat calcium rich foods as often as you are supposed to do	2.8	8.1	21.2	**48.5**	19.3
select appropriate foods to increase your calcium intake	2.9	7.4	17.2	**53.2**	19.2
stick to a diet which gives an adequate amount of calcium	3.2	8.0	22.3	**48.4**	18.0
obtain foods that give an adequate amount of calcium	3.6	7.3	14.9	**54.1**	20.1
remember to eat calcium rich foods	9.0	9.1	21.4	**42.7**	17.8
take calcium supplements if you don't get enough calcium from you diet	2.3	8.9	17.4	**49.8**	21.6
Note: Most frequent responses are bolded.					
SD= Strongly Disagree; D= Disagree; N=Neutral; A=Agree; SA=Strongly Agree					

IV. DISCUSSION

In this current study, participants had low level of knowledge on osteoporosis; other studies have also found a low level of osteoporosis knowledge in women; for example, Etemadifar et al. (2013)[8] stated, mean OKT scores were 63.0%. Participants also perceived a low susceptibility to osteoporosis which may possible due to the lack of knowledge regarding osteoporosis; in addition, considering the low personal and family history of osteoporosis, it was expected that

our study respondents did not perceive themselves to be at risk. Doheny et al. (2007)[9] reported similar perceived osteoporosis susceptibility scores which was low; hence women generally do not perceive themselves to be susceptible to osteoporosis. But this study found higher self-efficacy perhaps reflecting a greater degree of confidence regarding changing dietary habits and exercise behaviours; which is consistent with Evenson & Sanders, (2016) [10].

V. CONCLUSION

Without a clear understanding of risk of osteoporosis, women cannot begin to protect themselves from fracture. Although osteoporosis is a preventable disease affecting millions of people, public awareness remains low; therefore the finding of this current study is a mile stone for both Malaysia and globally.

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