Scholars Journal of Applied Medical Sciences (SJAMS)
Abbreviated Key Title: Sch. J. App. Med. Sci.
ISSN 2320-6691 (Online)
ISSN 2347-954X (Print)

A Unit of Scholars Academic and Scientific Society, India
www.saspublishers.com

Surgery

Body Mass Index on Musculoskeletal Pain And Physical Activity Among Elderly

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Original Research Article

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Article History
Received: 11.01.2018
Accepted: 20.01.2018
Published: 30.01.2018

DOI:
10.36347/sjams.2018.v06i01.019

Abstract: The rate of obesity has increased in over the years and has become one of the leading causes of morbidity and mortality in Malaysia. It can be said that overweight and obesity are a current trend in our public health problem. Therefore, it increases the risk factor for other problems such as musculoskeletal pain and low physical activity which lead to poor quality of life. This was a cross-sectional by applying of simple random sampling method. There were 372 participants involved in this study and majority of them (51.9%) were overweight. For gender, about 63.7% were female and 36.3% were male. Mostly of the participants were between 60 to 64 years old range (53.2%). Based on the findings, the result showed that there was significant association between age, gender and BMI on the level of musculoskeletal pain. On the other hand, only age showed that there was significant difference on level of physical activity. Majority of the respondent who had overweight BMI experienced musculoskeletal pain. Thus, the healthcare provider especially nurse should plan effective interventions to overcome these problems so that our elderly population willhave better quality of life.

Keywords: BMI, Elderly, Musculoskeletal Pain, Physical Activity.

INTRODUCTION

Body mass index (BMI) is one of the important parameter in the anthropometry measurement. BMI is calculated as measured body weight (kg) divided by measured height (m) squared. The BMI is classified accordingly to their specific range for example underweight (<18.5), normal (18.5-24.9), overweight (25.0-29.9) and obese (>30.0), furthermore an increase in adipose tissue mass will cause an elevated in BMI [1].

A study showed that approximately 65% of respondent aged 20 years and older was either overweight or obese [2]. On the other hand, the incidence of obesity also rises in United States [3].

In Malaysia, the rate of obesity has increased in over the years and has become one of the leading causes of morbidity and mortality in the country and it is also rapidly becoming the norm of our modern society [4]. Therefore, it can be said that overweight and obesity are a current trend in our public health problem. This was supported by a study done on elderly taxi drivers in Malaysia which found that 47.5% were pre-obese, 24.0% were obese class 1 [5].

A study discovered that overweight and obese patients are at a higher risk for musculoskeletal pain [2]. A cross-sectional study found that there was an association between obesity and pain in older adults [6]. From their study, there were positive associations of BMI with knee, hip, and back pain and lower limb joint pain have been reported in older adults [6].

Furthermore, they have reported in older adults, increased in BMI also was associated with reduced physical function [7]. Not only the above problem but also, they have mentioned foot pain and disability was the most common problem related to increase BMI.

Elevated BMI coupled with musculoskeletal pain and functional limitations, produces major effect especially in health-related quality of life. Weight loss reduces joint forces thereby reducing painful stimuli and potentially lowering fear of physical activity among elderly [1]. The problem of elevated body weight and BMI has become an important issue studied by researchers around the world and most of the world's population live in countries where overweight and obesity kills more people [1]. Therefore, it increases the risk factor for non-communicable diseases such as musculoskeletal disorders, cardiovascular disease and diabetes [8]. World Health Organizations suggest that an adult to engage in regular physical activity for 150 minutes per week [1].

Elevated in BMI are considered as major public health treats not only in global, but also in our national state. Within a decade, the prevalence of overweight among the Malaysian elderly population has doubled [9]. Thus, it can be concluded that that approximately 30% of Malaysian elderly Malaysian are overweight. In addition, regarding with abdominal obesity, they found that the prevalence was highest in the 50-59 years age group [10].

In Western societies, musculoskeletal pain is one of the most common reasons or seeking medical advice [11]. In addition, Norwegian who took sick leave for longer than four days mostly because of musculoskeletal problem [12]. Furthermore, there was no such study done on the local area, therefore the researcher wanted to do a survey on the relation of elderly people's body weight, their musculoskeletal pain and physical activity.

MATERIALS AND METHODS

A cross-sectional study was conducted by using self-administered questionnaire. Participants were included if they met the inclusion criteria. This study was carried out at the recreational area of Kuantan city, Malaysia where the research able to get the elderly population.

The inclusion criteria were Kuantanese, elderly who was 60 years and above and able to speak and write either in Malay or English. Those participants who had a fracture for the past 6 months and disabled people were excluded due to their inability to be independent in activities. The eligible participants were identified by selecting a group of participants for study from a population according to the inclusion criteria. Therefore, to able to gets studied participants, the research used simple random sampling method. A recommended sample size of 380 participants after calculated by Raosoft formula would be enough with the margin of error was 5%, the confidence interval was 95%, and 50% of distribution level [13].

Data were collected between December 2015 and February 2016 using self-administer questionnaire. There were three parts in the questionnaire: Part A, Part B and Part C. Part A consisted of socio-demographic data of participants. In the part B included questions about physical function of participants which was adapted from International Physical Activity Questionnaire (IPAQ) [14]. The questions asked about the time the participant spent being physically active in the last 7 days. The scoring for this questionnaire was expressed as MET-min per week: MET level x minutes of activity/day x days per week. There were two levels of physical activity suggested for classifying the participant. The levels were poor level of physical activity and good level of physical activity. The poor level of physical activity was counted as less than 600 MET while good level of physical activity was counted as 601 and above MET score.

The part C contained 18 questions about the assessment of participants' musculoskeletal pain which was adapted from Orebro Musculoskeletal Pain Screening Questionnaire (OMPQ) [15]. The questionnaires were using ten-point Likert scale ranging from 0 (strongly disagree) to 10 (strongly agree). The score of 105 and below classified as low risk, score of 106 to 130 was classified as moderate risk and score of 131 and above was classified as high risk.

The researcher obtained ethical approval from the studied setting prior to actual study. All participants were given written informed consent prior to enrolment. Additionally, the consent form specified that patients could withdraw from the study at any time. All gathered information from the participants was kept confidential throughout the research process.

Data were analysed using the Statistical Package for Social Sciences (SPSS), version 20.0. Descriptive statistics which was categorical variables were expressed as absolute frequencies and percentages. Inferential statistics such as Chi square test was used to see the association between BMI on musculoskeletal pain and physical activity. The p value of less than 0.05 was set at statistical significance in this study.

RESULTS

Sociodemographic characteristic

A total of 372 participants were participated in this study. The participants were predominantly female (n=237, 63.7%) with age 60 to 64. Most participants were married n=366, 98.4%) and unemployed (n=229, 61.6%). Regards to their education, majority of them are having primary education level (n=134, 36%) as shown in table 1.

Table-1: Socio-demographic data of participants (n=372)

Variables	Frequency (n)	Percentage (%)
Age		
60-64	198	53.2
65-69	98	26.3
>70	76	20.4
Gender		
Male	135	36.3
Female	237	63.7
Marital status		
Single	3	0.8
Married	366	98.4
Divorced	3	0.8
Education level		
Primary	134	36.0
Secondary	109	29.3
Tertiary	129	34.7
Occupation		
Employed	143	38.4
Unemployed	229	61.6

All participants were categorized based on their BMI status. The total of participants (n=193, 51.9%) were in the overweight group while the other (n= 95, 25.5%) were in the normal group. On the other hand, the other participants (n=48, 12.9%) were in the underweight group while the rest (n=36, 9.7%) were in the obese group.

BMI status and level of musculoskeletal pain

The relationship between BMI and musculoskeletal pain was analysed by using Chi square test. Statistical differences were demonstrated on the frequency and percentage of four group of BMI and the level of musculoskeletal pain.

From 372 of the participants, normal (n=56, 58.9%) and underweight (n=28, 58.3%) BMI were most of the low risk category for musculoskeletal pain. Meanwhile, there were (n=103, 53.42) from overweight group and (n=22, 61.1) from the obese group were the majority in the moderate risk for musculoskeletal pain as shown in table 2. Therefore, significant difference was found in the BMI relationship indicator of the level of musculoskeletal pain.

BMI status and level of physical activity

In the BMI status and level of physical activity, there was significant association were observed with p value of 0.04 as shown in table 2. However, low score on the indicator of poor physical activity suggest that most of the participants still having poor physical activity.

Socio-demographic characteristics on musculoskeletal pain and physical activity

Socio-demographic characteristics were divided into 5 domains. In the age domain, significant differences were observed for both musculoskeletal and physical activity. In the gender domain, significant differences were observed only in the level of musculoskeletal pain. Furthermore, in the marital status domain, education level domain and occupation, no significant differences were observed for both musculoskeletal pain and physical activity as shown in table 2.

Table-2: Association of socio-demographic data on musculoskeletal pain (n=372)

Variables	Musculoskeletal Pain			x^2	P value
	Low n(%)	Moderate n(%)	High n(%)		
Age					
60-64	128 (64.6)	70 (35.4)	0 (0)	9.843	**0.007**
65-69	30 (30.6)	62 (63.3)	6 (6.1)		
>70	28 (36.8)	48 (63.2)	0 (0)		
Gender			0 (0)		
Male	57 (42.2)	78 (57.8)	6 (2.5)	5.004	**0.04**
Female	129 (54.4)	102 (43.0)			
			0 (0)		
Marital status			6 (1.6)		
Single	3 (100)	0 (0)	0 (0)		
Married	181 (49.5)	179 (48.9)		6.042	0.196
Divorced	2 (66.7)	1 (33.3)	0 (0)		
			4 (4.2)		
BMI			1 (0.5)		
Underweight	28 (58.3)	20 (41.7)	1 (2.8)	15.904	**0.014**
Normal	56 (58.9)	35 (36.8)			
Overweight	89 (46.1)	103 (53.42)	3 (2.2)		
Obese	13 (36.1)	22 (61.1)	1 (0.9)		
			2 (1.6)		
Education level					
Primary	62 (46.3)	69 (51.5)	3 (2.1)	5.222	0.064
Secondary	49 (45.0)	59 (54.1)	3 (1.3)		
Tertiary	75 (58.1)	52 (40.3)			
Occupation					
Employed	61 (42.7)	79 (55.2)		3.330	0.493
Unemployed	125 (54.6)	101 (44.1)			

DISCUSSION

Based on gender, male and female was relatively unequal in number since the female participants dominate in this study. There were also findings that demonstrated the same result in which the number of female was higher [16].

Almost 100% of the participants were married since they get married at their adult age. Previous research showed that, the elderly who get already married was 92% [17]. In addition, there were also studies supported that their elderly participants were above 90% who were married [18].

Majority of the participants was unemployed since most of them already retired while those who were employed were those who were self-working. Furthermore, there were many elderly participants who were facing the problems of overweight in this study. This finding was parallel with other research which stated that almost half of the participants were pre-obese and was classified into overweight [5]. These finding were also consistent with research by Moreira-Silva et al. [19] which has suggested that a higher proportion of overweight was seen among participants. The possible explanation for this would be the metabolism rate decrease with age. Therefore, it was difficult for the elderly to maintain an ideal BMI.

Most of the studied participants who were having higher BMI or overweight tended to experience higher risk of musculoskeletal pain compared to others. Based on previous researches regarding, the results show that majority has complaint of musculoskeletal pain in regards with higher BMI [20]. The result was also parallel to Moreira-Silva et al. [19] which figure out the more frequently complaint of musculoskeletal pain related to those who were either overweight or obese as compared to normal BMI.

Compared to previous research worldwide, obesity is also a risk factor for musculoskeletal pain. In addition, overweight was significantly associated with incidence of severe knee pain in 2012 [21]. BMI was consistently associated with chronic pain in the low back especially among women. In the general elderly population, the effect of excess body weight was a modifiable risk factor for chronic pain or musculoskeletal pain [11]. Therefore, it underlines the importance of promoting preventive and avoiding measures to aim at reducing the number and percentage of overweight and obese elderly.

There was a relationship between participants' BMI and level of physical activity. Furthermore, they were having poor physical activity. Generally, the finding was contrast with the previous research which found that no association between BMI and total physical activity [22]. Majority of the participants claimed to practice a good lifestyle with exercise and also involved in physical activity [23]. Kamada et al. also claimed that physical activity was not associated with BMI [24].

Irrespective of the baseline BMI, reducing sedentary lifestyle is a protective measure especially for people with poor physical activity. Exercise for 1 hour or more can help in reducing 20% of the risk to get musculoskeletal pain [25]. Physical activity may compensate to some extent for the adverse effect of excess body mass on risk of musculoskeletal pain. Another study showed that consistent physical activity was associated with a reduced risk in getting the disease [25]. The protective effect of physical activity was consistent in both overweight and normal weight subjects [25]. Aerobic exercise was associated with a reduction in blood pressure for both normal weight and overweight participants [23]. Independent of the baseline of BMI, the protective effect of physical activity was consistent in both overweight and normal weight subjects.

CONCLUSION

Findings from this study suggested that nurses should play their significant role in performing the comprehensive health assessment for elderly population. This task can be done through the implementation of Health Promotion Program or to formulate well-designed training program to avoid overweight. Furthermore, nurses must provide an essential knowledge and practice to be able to assess the public health status especially elderly on planning the appropriate intervention immediately.

The level of awareness regarding their BMI should signal for urgent action to be taken. Early detection and management of elevated BMI and seriousness of musculoskeletal pain is important to promote better quality of life among elderly. Finally, the researcher would like to recommend for future study on anthropometry measurement in order to comprehensively understand the mechanism of musculoskeletal pain and physical activity of elderly population.

ACKNOWLEDGEMENT

We would like to express our sincere appreciation to all studied participants who participated in this study. Sincere thanks to International Islamic University Malaysia (IIUM) for funding this study (RIGS16-140-0304).

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