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Assessment of risk factors for breast and ovarian cancer in UMS students

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Abstract: *Cancer is a major public health problem and the third leading cause of death in Malaysia . Breast and ovarian cancers are the first and fourth most common cancer among women in Peninsular Malaysia. Our aim is to assess the risk factors in healthy young adult female students from UMS and will act as an input for further prevention of breast and ovarian cancer.*

Total 278 Medical and Nursing students from Faculty of Medicine and Health Sciences were participate in this study. Assessing the hereditary risk factor, total 12.34% gives positive result for history of breast tumour in first degree relatives and for ovarian tumour total 1.8% gives positive results in first degree relatives. An overall mutation frequency of 2.3%, in woman who had at least one first-degree relative with breast cancer diagnosed at age <50 years (Hartge et al. (1999) . The lifetime risk of breast cancer among female mutation carriers was 82% and lifetime risks of ovarian cancer were 54% for BRCA1 *and 23% for* BRCA2 *mutation carriers. . Risk-reducing options are available to women with a strong family history of breast and ovarian cancer. These options include high-risk screening, chemoprevention, and prophylactic surgery. In our study, 63.7% is not meeting with WHO recommendation for Metabolic Equivalent Task (MET) and remaining 36.3% meets WHO recommendation. By using International Physical Activity Questionnaire (IPQA)Score protocol,only 2.6 % of Medical students showed Health Enhancing Physical Activity (HEPA) active,36.4 % showed minimally active and 60.9% showed inactive. Among nursing students only 5.5% showed HEPA active, 35.4% showed minimally active and 59.1% are inactive. Primary prevention through behavioural and life style modification is a cost-effective means of preventing the large burden cancer has on societies world-wide .*

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I. Introduction

Cancer is a major public health problem in Malaysia including Sabah. Malignant neoplasm is the third leading cause of death in Malaysia . Breast cancer was the most common cancer in females and also the first most common cancer among population regardless of sex in Malaysia (1). The International Agency for Research in Cancer (GLOBOCAN) 2012 estimated the age-standardised rate(ASR) of breast cancer in Malaysia as 38.7 per 100,000 with 5410 new cases in 2012 (2) . Overall, Malaysian women have poor survival from breast cancer and it is estimated that half of the deaths due to breast cancer could be prevented. Malaysian women occur breast carcinoma at earlier age compared to women in Western countries. However Malaysian women present at later stages compared to women in Western countries and Singapore(3-5)

According to the National Cancer Registry, ovarian cancer is the fourth most common cancer among women in Peninsular Malaysia, making up five per cent of all female cancer cases. Ovary Cancer Incidence is 7 per 100,000 population (CR) and Age-standardized rate is 7.6% (ASR), by sex, Peninsular Malaysia 2006 (6)

Approximately 7% of breast carcinomas and 10% of ovarian carcinomas result from alterations in genes that are passed down from either the mother or father .The majority (approximately 84%) of hereditary breast carcinomas result from inherited mutations in two genes, *BRCA1* and *BRCA2* [5]. . For such women, evaluation of family history is an important screening tool to identify the possibility of hereditary breast and ovarian cancer risk .(7)

II. Literature Review

Carcinoma of the breast is the most common non-skin malignancy in women and is second only to lung cancer as a cause of cancer deaths. More women are diagnosed with breast cancer than any other cancer. This year, an estimated 252,710 women in the United States will be diagnosed with invasive breast cancer, and 63,410 women will be diagnosed with in situ breast cancer. An estimated 2,470 men in the United States will be diagnosed with breast cancer.

It is estimated that 41,070 people (40,610 women and 460 men) will die from breast cancer this year.(*Statistics adapted from the American Cancer Society's publication,* Cancer Facts & Figures 2017, *and the National Cancer Institute Surveillance Epidemiology and End Results (SEER) database.)*

Most breast cancers are sporadic, meaning they develop from damage to a person's genes that occurs by chance after they are born. There is no risk of passing this gene on to a person's children. Inherited breast cancers are less common, making up 5% to 10% of cancers. Inherited breast cancer occurs when genetic mutations are passed down within a family from one generation to the next Many of those mutations are in tumor suppression genes, such as *BRCA1* or *BRCA2*. These genes normally keep cells from growing out of control and turning into cancer. But when these cells have a mutation, they can grow out of control.

A risk factor is anything that increases a person's chance of developing cancer. Risk factors consistently associated with a higher breast cancer risk are called "established" risk factors. Established risk factors include getting older, having regular menstrual periods earlier,going through menopause later in life, having a first child late in life, not having any children,having a mother or sister with breast cancer, past exposure of breasts to ionizing radiation, orhaving certain types of benign breast disease. But these factors explain only about 25 to 50% of breast cancer cases.(10-11)

The following factors may raise a woman's risk of developing breast cancer.

Age. The risk of developing breast cancer increases as a woman ages, with most cancers developing in women older than 50.

Personal history of breast cancer. A woman who has had breast cancer in 1 breast has a higher risk of developing a new cancer in either breast.

Family history of breast cancer. Breast cancer may run in the family if your family has 1 or more of the following characteristics:

First-degree relatives, such as mothers, sisters, and children, who have been diagnosed with breast cancer or ovarian cancer, especially before age 50. If 2 first-degree relatives developed breast cancer, the risk is 5 times the average risk.Many close relatives who have been diagnosed with breast cancer or ovarian cancer, especially before age 50.

Inherited risk/Genetic predisposition. There are several inherited genes linked with an increased risk of breast cancer, as well as other types of cancer. *BRCA1* or *BRCA2* are the most common known mutations. Mutations in these genes are linked to an increased risk of breast and ovarian cancers, as well as other types of cancer

Personal history of ovarian cancer. *BRCA1* and *BRCA2* gene mutations greatly increase the risk of **both ovarian and breast cancers**. Therefore, women diagnosed with hereditary ovarian cancer caused by a *BRCA* gene mutation have an increased risk of breast cancer as well. Women with breast cancer who did not inherit a *BRCA1* or *BRCA2* mutation are generally not at increased risk of ovarian cancer.

Estrogen and progesterone exposure.

Women who began menstruating before ages 11 or 12 or went through menopause after age 55 have a somewhat higher risk of breast cancer. This is because their breast cells have been exposed to estrogen and progesterone for a longer time.

Women who had their first pregnancy after age 35 or who have never had a full-term pregnancy have a higher risk of breast cancer. Pregnancy may help protect against breast cancer because it pushes breast cells into their final phase of maturation.

Hormone replacement therapy after menopause. Using hormone therapy with both estrogen and progestin after menopause, often called postmenopausal hormone therapy or replacement, within the past 5 years or for several years increases a woman's risk of breast cancer

Oral contraceptives or birth control pills. Some studies suggest that oral contraceptives slightly increase the risk of breast cancer, while others have shown no link between the use of oral contraceptives to prevent pregnancy and development of breast cancer.

Race and ethnicity. Breast cancer is the most common cancer diagnosis in women, other than skin cancer, regardless of race. White women are more likely to develop breast cancer than black women, but among women younger than 45, the disease is more common in black women than in white women. . Breast cancer diagnoses have been increasing in second generation Asian/Pacific Islander and Hispanic women for unclear reasons. However, the increase is likely related to changes in diet and lifestyle associated with living in the United States.

Lifestyle factors. As with other types of cancer, studies continue to show that various lifestyle factors may contribute to the development of breast cancer.

Weight. Recent studies have shown that postmenopausal women who are overweight or obese have an increased risk of breast cancer. These women also have a higher risk of having the cancer come back after treatment.

Physical activity. Increased physical activity is associated with a decreased risk of developing breast cancer and a lower risk of having the cancer come back after treatment. Regular physical activity may protect against breast

cancer by helping women maintain a healthy body weight, lowering hormone levels, or causing changes in a women's metabolism or immune factors.

Alcohol. Current research suggests that having more than 1 to 2 alcoholic drinks, including beer, wine, and spirits, per day raises the risk of breast cancer, as well as the risk of having the cancer come back after treatment.

Food. There is no reliable research that confirms that eating or avoiding specific foods reduces the risk of developing breast cancer or having the cancer come back after treatment. However, eating more fruits and vegetables and fewer animal fats is linked with many health benefits.

Socioeconomic factors. More affluent women in all race and ethnic groups have a higher risk of developing breast cancer than less affluent women in the same groups. The reasons for this difference are not known. But these differences may be due to variations in diet, environmental exposures, and other risk factors such as breast density. Women living in poverty are more likely to be diagnosed at an advanced stage and are less likely to survive the disease than more affluent women. This is likely due to multiple factors, including lifestyle factors, other health conditions such as obesity, and tumor biology. Access to health care and a range of treatment options play additional roles.

Radiation. Exposure to ionizing radiation at a young age may increase a woman's risk of breast cancer. For example, therapeutic radiation to the chest for Hodgkin lymphoma may increase breast cancer risk.

The very small amount of radiation a woman receives during a yearly mammogram has not been linked to an increased risk of breast cancer.

Breast density.

Dense breast tissue may make it more difficult to find a tumor on standard imaging tests, such as mammography .Breast density may be from higher levels of estrogen, rather than a separate risk factor, and usually decreases with age. Some states require that mammogram results include information about breast density if the results show that a woman has dense breast tissue. Researchers are looking at whether lowering breast density might also decrease the risk of breast cancer

Estrogen is essential for the normal functioning of a woman's reproductive system and for normal breast development. Lifetime exposure to estrogen is thought to increase a woman's risk for breast cancer. Understanding how estrogen works in the body, knowing that chemicals in the environment can mimic the effects of estrogen and/or disrupt normal estrogen metabolism in the body, understanding how hormone replacement therapy and birth control pills may be associated to estrogen exposure, and how diet and lifestyle choices affect lifetime exposure to estrogen, will help women make more informed decisions about their bodies and their environment.(12)

This study will estimate the hereditary risk factor, estrogen exposure and life style factors including body weight and physical activity by using questionnaires. Assessment of these risk factors and correlate with other parameters are done in healthy young adults UMS students.

OBJECTIVES

General objective:

To assess risk factors for breast and ovarian cancers in UMS students

Specific objectives::

1. To assess the hereditary risk factors for breast and ovarian cancers
2. To assess other risk factors ; obesity,estrogen exposure and physical inactivity
3. To make recommendation for further genetic studies on presence of BRCA1 And BRCA 2 , based on findings of hereditary risk factor.

III. Research Methodology

Description of Methodology

Study design : Cross sectional ,questionnaire based study

The data were collected using a cross-sectional questionnaire survey and received the answers based on genetic assessment of Breast and ovarian cancers, medical and surgical history consisting of exposure to any carcinogens whether chemicals or radiation therapy of participants. Hormonal history is also taken by asking whether on hormone replacement therapy or contraceptive pills . Participant 's mentural history is also asked including age of menarche, duration of menstrual cycle, patternof bleeding and amount of blood loss in each mentural cycle. Physical activity assessment is also done by using Global physical acitivity questionnae (GPAQ).

A total of 278 students of Faculty of Medicine, University Malaysia who gave informed consent to participate in the study were included in the study.
The respondents were asked to give their demographic data including the age, gender ,matric number, IC number, race (ethnicity), religion and permanent address.
Body weight in Kilogram and height in cm are also measured.
Population year1 to year 5 Female medical students, UMS
Year 1 to year 3 Female nursing students ,UMS

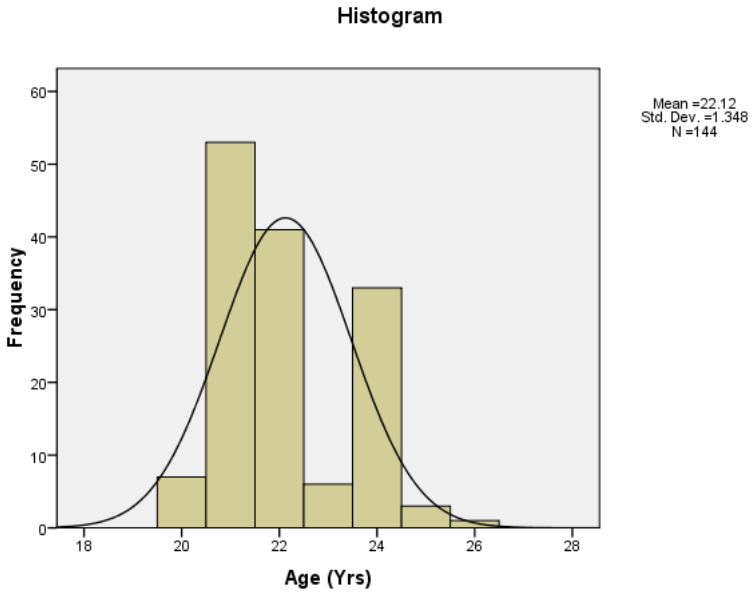
Place - Faculty of Medicine and Health sciences,
University Malaysia Sabah

IV. Research Findings /Results

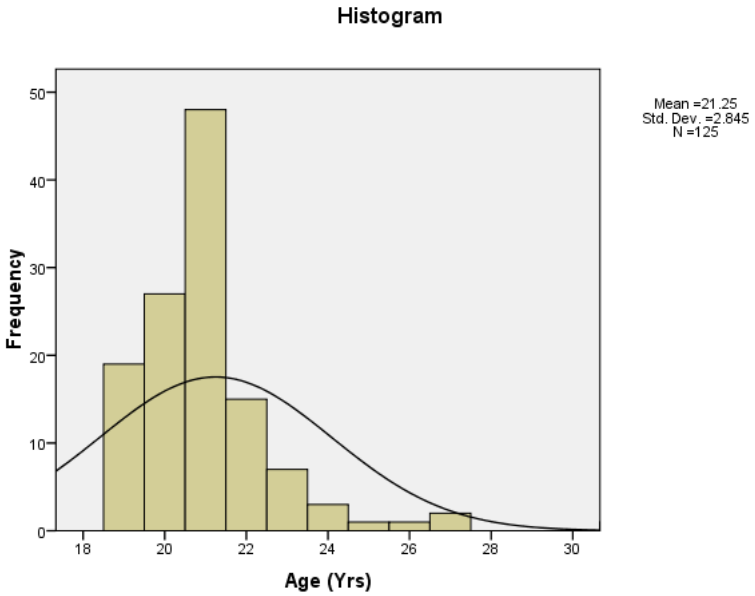
Year of course * Name of course Crosstabulation

			Name of course		
			Medical student	Nursing student	Total
Year of course	1	Count	8	49	57
		% within Year of course	14.0%	86.0%	100.0%
	2	Count	61	36	97
		% within Year of course	62.9%	37.1%	100.0%
	3	Count	44	42	86
		% within Year of course	51.2%	48.8%	100.0%
	5	Count	38	0	38
		% within Year of course	100.0%	.0%	100.0%
Total		Count	151	127	278
		% within Year of course	54.3%	45.7%	100.0%

AGE
Medical students



Nursing students



RACE

Race

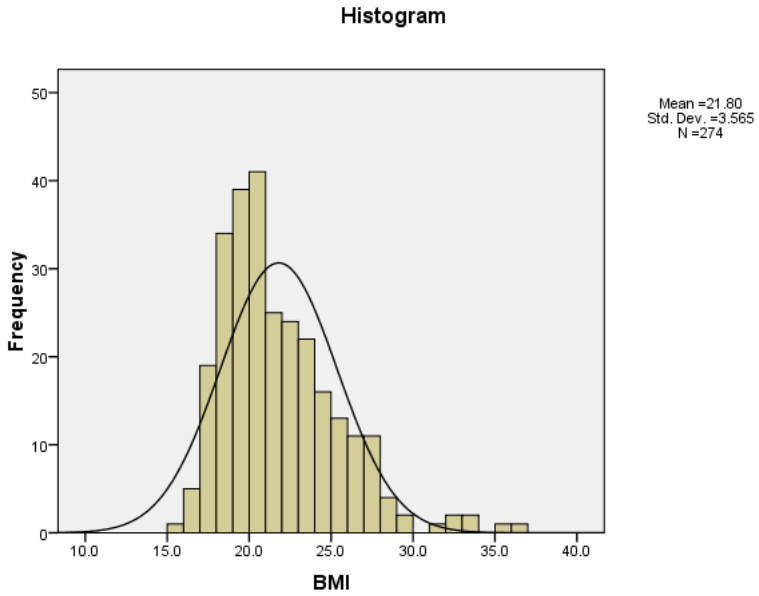
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Malay	50	18.0	18.1	18.1
	Chinese	39	14.0	14.1	32.1
	Indian	30	10.8	10.8	43.0
	Others	158	56.8	57.0	100.0
	Total	277	99.6	100.0	
Missing	System	1	.4		
Total		278	100.0		

RELIGION

Religion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Islam	113	40.6	41.7	41.7
	Christian	101	36.3	37.3	79.0
	Buddhist	30	10.8	11.1	90.0
	Hindu	27	9.7	10.0	100.0
	Total	271	97.5	100.0	
Missing	System	7	2.5		
Total		278	100.0		

BMI (BODY MASS INDEX)



Underweight (<18.5 kg/m2)
Normal weight (18.5–24.9 kg/m2)
Overweight (25–29.9 kg/m2)
Obese (>30 kg/m2)

Categories of BMI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Underweight	38	13.7	14.0	14.0
	Normal weight	186	66.9	68.4	82.4
	Overweight	41	14.7	15.1	97.4
	Obese	7	2.5	2.6	100.0
	Total	272	97.8	100.0	
Missing	System	6	2.2		
Total		278	100.0		

Breast tumour in First degree relative n=278

First degree relatives	No	Breast tumour		Exposure	
		Unilateral	Bilateral	Radiation	Hormone
Mother	-	24	1	2	1
Sister	-	6	1	0	1
Total	247 (88.8%)	30 (12.14%)	2 (0.2%)	2	2

Breast tumour in First degree relative by Race n=278

First degree relatives	No	Races			
		Malay	Chinese	Indian	Others
Mother	-	5	6	4	10
Sister	-	1	1	2	2
Total	247 (88.8%)	6 (2.2%)	7 (2.5%)	6 (2.2%)	12 (4.3%)

Fisher's Exact Test= 8.379 *p=0.144* (Not significant)

Breast tumour in Second degree relative n=278

Second degree relatives	No	Breast tumour		Exposure	
		Unilateral	Bilateral	Radiation	Hormone
Maternal Grandmother	-	3	0	0	0
Paternal Grandmother	-	3	0	0	0
Maternal Aunt	-	11	0	1	2
Paternal Aunt	-	11	0	0	0
Half Sibling	-	0	0	0	0
Total	250 (89.9%)	28 (11.2%)	0	1	2

Breast tumour in Second degree relative by Race n=278

Second degree relatives	No	Races			
		Malay	**Chinese**	**Indian**	**Others**
Maternal Grandmother	-	1	0	0	2
Paternal Grandmother	-	0	2	0	1
Maternal Aunt	-	2	1	0	8
Paternal Aunt	-	2	2	2	5
Half Sibling	-	0	0	0	0
Total	250 (89.9%)	5 (1.8%)	5 (1.8%)	2 (0.7%)	16 (5.8%)

Fisher's Exact Test =8.679 *p=0.628* (Not significant)

Breast tumour in Third degree relative n=278

Third degree relatives	No	Benign tumour		Exposure
		Unilateral	Bilateral	Radiation
Maternal Great Grandmother	-	1	1	0
Paternal Great Grandmother	-	0	0	0
Maternal Great Aunt	-	2	0	0
Paternal Great Aunt	-	1	1	1
First cousin	-	0	0	0
Total	273 (98.1%)	4 (1.4%)	2 (0.73%)	1

Breast tumour in Second degree relative by Race n=278

Third degree relatives	No	Races			
		Malay	**Chinese**	**Indian**	**Others**
Maternal Great Grandmother	-	0	0	2	0
Paternal Great Grandmother	-	0	0	0	0
Maternal Great Aunt	-	1			1
Paternal Great Aunt	-			1	
First cousin	-				
Total	273 (98.1%)	1 (0.4%)	0	3 (1.1%)	1 (0.4%)

Fisher's Exact Test =15.356 *p=0.014* (Significant)

Ovarian tumour in First degree relative n=278

First degree relatives	No	Benign tumour		Malignant tumour		Exposure	
		Unilateral	Bilateral	Unilateral	Bilateral	Radiation	Hormone
Mother	-	3	0	2	0	2	2
Sister	-	0	0	0	0	0	0
Total	273 (98.2%)	3 (1.1%)	0	2 (0.7%)	0	2	2

Ovarian tumour in First degree relative by race n=278

First degree relatives	No	Races			
		Malay	Chinese	Indian	Others
Mother	-	3	1	1	0
Sister	-	0	0	0	0
Total	273 (98.2%)	3 (1.1%)	1 (0.35%)	1 (0.35%)	0

Fisher's Exact Test =8.866 *p=0.013* (Significant)

Ovarian tumour in Second degree relative n=278

Second degree relatives	No	Benign tumour		Malignant tumour		Exposure	
		Unilateral	Bilateral	Unilateral	Bilateral	Radiation	Hormone
Maternal Grandmother	-	0	0	0	0	0	0
Paternal Grandmother	-	0	0	1	0	1	1
Maternal Aunt	-	1	0	0	0	0	0
Paternal Aunt	-	2	0	0	0	0	0
Half Sibling	-	0	0	0	0	0	0
Total	274 (98.5%)	3 (1.1%)	0	1 (0.4%)	0	1	1

Ovarian tumour in Second degree relative by Race n=278

Second degree relatives	No	Races			
		Malay	Chinese	Indian	Others
Maternal Grandmother	-	0	0	0	0
Paternal Grandmother	-	1	0	0	0
Maternal Aunt	-	0	0	1	0
Paternal Aunt	-	1	1	0	0
Half Sibling	-	0	0	0	0
Total	274 (98.5%)	2 (0.7%)	1 (0.4%)	1 (0.4%)	0

Fisher's Exact Test =14.619 *p=0.031* (Significant)

Ovarian tumour in Third degree relative n=278

Third degree relatives	No	Benign tumour		Malignant tumour		Exposure	
		Unilateral	Bilateral	Unilateral	Bilateral	Radiation	Hormone
Maternal Great Grandmother	-	0	0	0	0	0	0
Paternal Great Grandmother	-	0	0	1	0	1	1
Maternal Great Aunt	-	0	0	0	0	0	0
Paternal Great Aunt	-	0	0	0	0	0	0
First cousin	-	0	0	0	1	1	
Total	276 (99.2%)	0	0	1 (0.4%)	1 (0.4%)	2	1

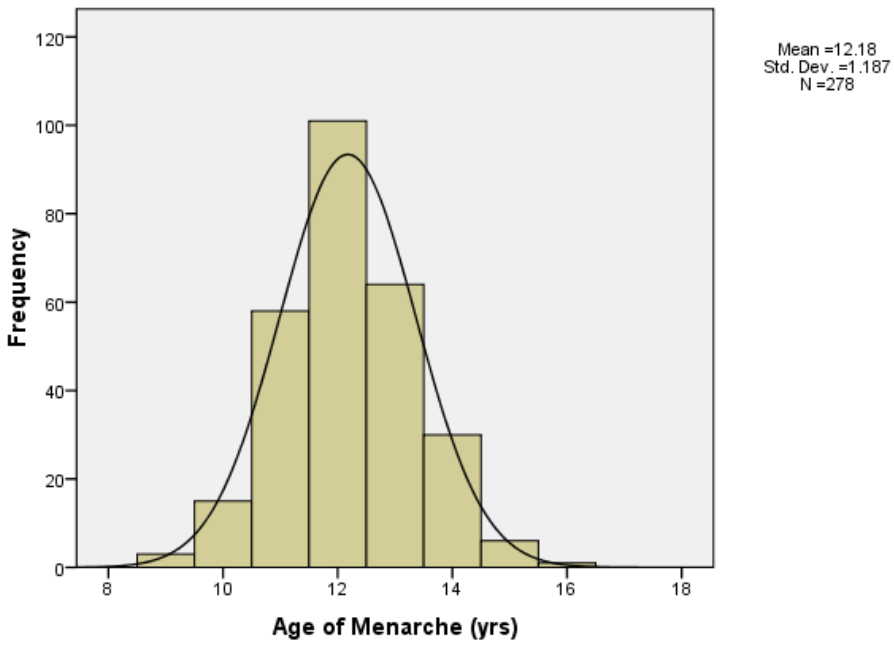
Ovarian tumour in Third degree relative by Race n=278

Third degree relatives	No	Races			
		Malay	**Chinese**	**Indian**	**Others**
Maternal Great Grandmother	-	0	0	0	0
Paternal Great Grandmother	-	1	0	0	0
Maternal Great Aunt	-	0	0	0	0
Paternal Great Aunt	-	0	0	0	0
First cousin	-	1	0	0	0
Total	276 (99.2%)	2 (0.8%)	0	0	0

Fisher's Exact Test =8.789 *p=0.184* (not Significant)

MENSTURAL HISTORY

Age of menarche

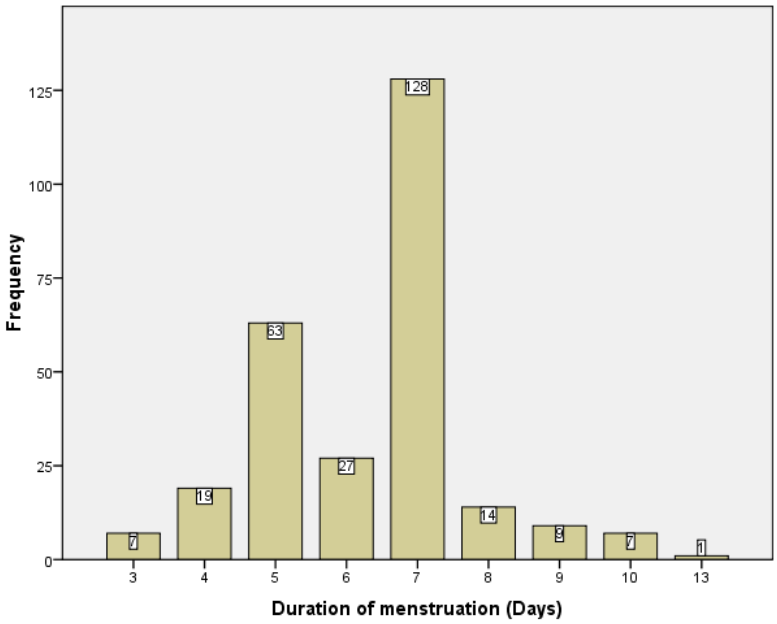


Regularity of menstruation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	226	81.3	81.3	81.3
	No	52	18.7	18.7	100.0
	Total	278	100.0	100.0	

Duration of menstruation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	7	2.5	2.5	2.5
	4	19	6.8	6.9	9.5
	5	63	22.7	22.9	32.4
	6	27	9.7	9.8	42.2
	7	128	46.0	46.5	88.7
	8	14	5.0	5.1	93.8
	9	9	3.2	3.3	97.1
	10	7	2.5	2.5	99.6
	13	1	.4	.4	100.0
	Total	275	98.9	100.0	
Missing	System	3	1.1		
Total		278	100.0		



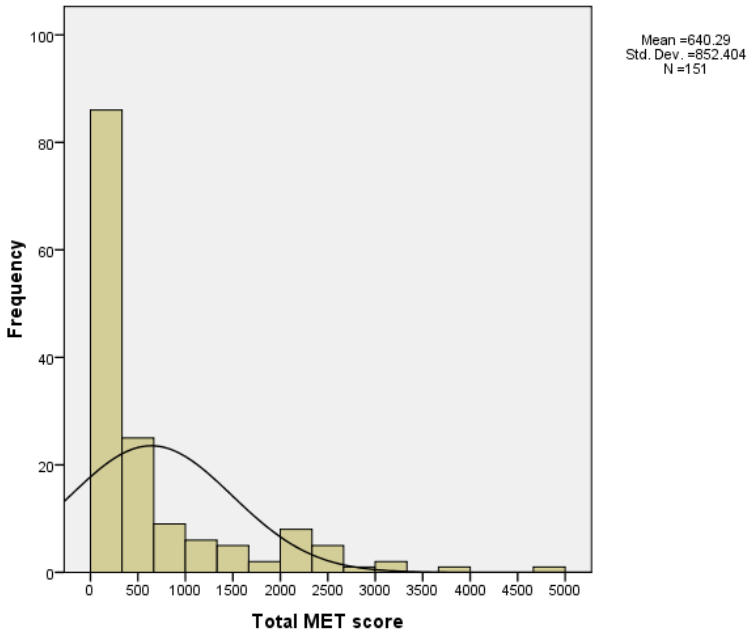
Metabolic Equivalent Task (MET) method

MET (Metabolic Equivalent)

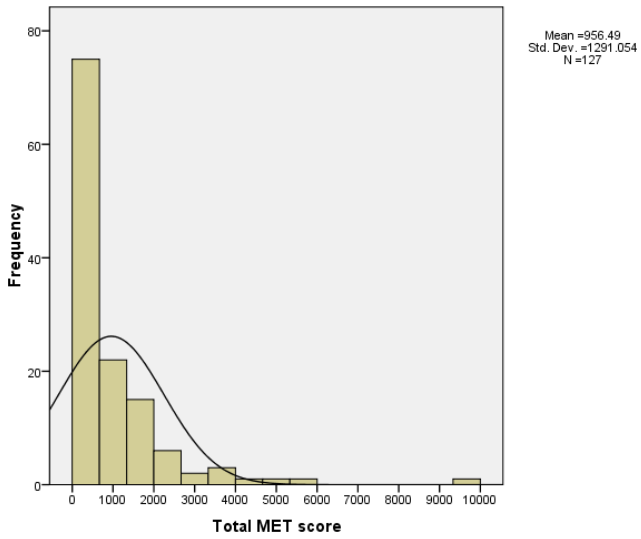
The ratio of the work metabolic rate to the resting metabolic rate. One MET is defined as 1 kcal/kg/hour and is roughly equivalent to the energy cost of sitting quietly. A MET also is defined as oxygen uptake in ml/kg/min with one MET equal to the oxygen cost of sitting quietly, equivalent to 3.5 ml/kg/min.

$$1\ \mathrm{MET}\ = 1\frac{\mathrm{kcal}}{\mathrm{kg} * h}\ = 4.184\frac{\mathrm{kJ}}{\mathrm{kg} * h} = 1.162\frac{\mathrm{W}}{\mathrm{kg}}$$

Physical Activity (MET) of Medical students



Physical Activity (MET) of Nursing students



WHO recommendation for Physical activity score MET

If Physical activity cut off value is MET<600, not meeting WHO recommendation.

Name of course * MET score of WHO reccomendation Crosstabulation

			MET score of WHO reccomendation		
			Not meeting WHO recommendation	Meet WHO Recommendation	Total
Name of course	Medical student	Count	108	43	151
		% within Name of course	71.5%	28.5%	100.0%

	Nursing student	Count	69	58	127
		% within Name of course	54.3%	45.7%	100.0%
Total		Count	177	101	278
		% within Name of course	63.7%	36.3%	100.0%

IPAQ Scoring Protocol

Categorical Score- three levels of physical activity are proposed

1. Inactive

• No activity is reported OR
• Some activity is reported but not enough to meet Categories 2 or 3.

2. Minimally Active

Any one of the following 3 criteria

• 3 or more days of vigorous activity of at least 20 minutes per day OR
• 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day OR
• 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.

3. HEPA active

Any one of the following 2 criteria

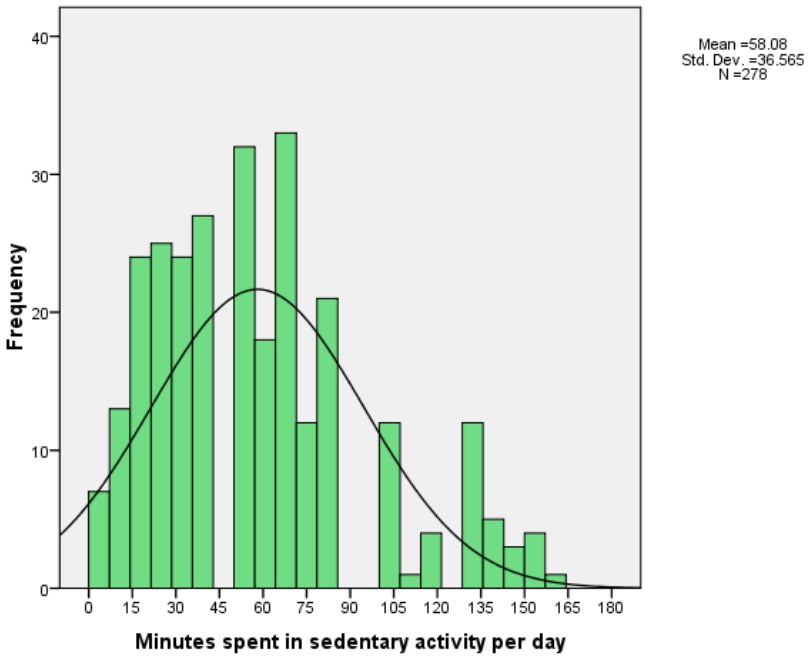
• Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET minutes/week OR

• 7 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes/week

Name of course * Physical activity of respondents Crosstabulation

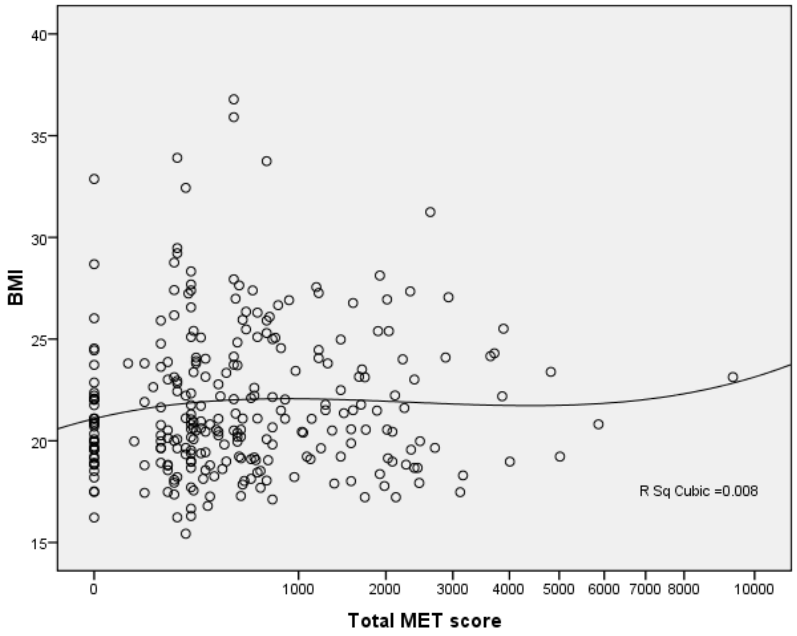
			Physical activity of respondents			
			HEPA active	Inactive	Minimally active	Total
Name of course	Medical student	Count	4	92	55	151
		% within Name of course	2.6%	60.9%	36.4%	100.0%
	Nursing student	Count	7	75	45	127
		% within Name of course	5.5%	59.1%	35.4%	100.0%
Total		Count	11	167	100	278
		% within Name of course	4.0%	60.1%	36.0%	100.0%

Minutes spent in sedentary activities on average per day.



Correlations between BMI and Total MET score

		BMI	Total MET score
BMI	Pearson Correlation	1	.033
	Sig. (2-tailed)		.589
	N	274	274
Total MET score	Pearson Correlation	.033	1
	Sig. (2-tailed)	.589	
	N	274	278



V. Research findings

This study focuses on 278 female students from Faculty of Medicine and Health sciences .Among them 151 students are medical students and remaining 127 students are nursing students. The age ranges from 18 to 26 years in Medical students and 18 to 28 years in nursing students.The mean is 21.25 for medical students and 22.12 for nursing students.The highest percentage belongs to 21 year old for both groups and lowest age belongs to 25 and 26 year old.

Regarding different races the highest percentage belongs to other groups. That means, kadazan, Dusun and other ethnic groups . These groups are higher than malay,Chinese and Indian.However regarding religion,the highest percentage belongs to Islam(40.6%).Christian 37.35,Buddhist 10.8 %,Hindu 9.7% and 2.5% is missing.

On estimating Body Mass Index (BMI), Normal BMI 68.4%, Underweight is 14.0%, overweight is 15.1% and obese is 2.6%.
Underweight (<18.5 kg/m2), Normal weight (18.5–24.9 kg/m2), Overweight (25–29.9 kg/m2), Obese (>30 kg/m2).

Regarding history of breast tumour in first degree relatives, total 12.34% gives positive result. Positive tumours in first degree relative by race show2.2% in Malay,2.5% in Chinese,2.2% in Indian and others 4.3%.

Regarding history of breast tumour second degree relatives in total 11.2% gives positive result and by race Malay 1.8%,Chinese 1.8%,Indian 0.7% and others 5.8%.

Regarding history of breast tumour in third degree relative, in total 1.13% gives positive result and by race Malay 0.4%, Indian 1.1 5 and others 0.4%.

Regarding history of ovarian tumour in first degree relatives,in total 1.8% gives positive result and by raceMalay1.1%,Chinese 0.35 and Indian 0.35%.

Regarding history of ovarian tumour in second degree relatives, total 1.5% gives positive results and by race Malay 0.7%, Chinese 0.4 % and Indian 0.4%.

Regarding history of ovarian tumour in third degree relative,total 0.8% gives positive result and by race malay gives 0.8 %.

Regarding menstrual history of the student, mean age for first menstruation or menarche is 12.18. among them 81.3% gives normal regular menstrual cycle and 18.7% gives irregular menstruation.Duration of menstruation takes 5 to 7 days in 22.7 and 46.0% respectively .

Regarding WHO recommendation for physical activity score,
MET (Metabolic Equavilant Task) less than 600 is not meeting WHO recommendation. In our study, out of 278 students, 63.7% is not meeting with WHO recommendation and remaining 36.3% meets WHO recommendation, Among them 71.5% of medical students and 54.3% of Nursing students are not meeting with WHO recommendation and only 23.5% of Medical students and 45.7% of Nursing students meet WHO recommendation.

In our study, out of 278 students, 63.7% is not meeting with WHO recommendation and remaining 36.3% meets WHO recommendation, Among them 71.5% of medical students and 54.3% of Nursing students are not meeting with WHO recommendation and only 23.5% of Medical students and 45.7% of Nursing students meet WHO recommendation.

In our study, by using International Physical Activity Questionnaire (IPQA)Score protocol,only 2.6 % of Medical students showed Health Enhancing Physical Activity (HEPA) active,36.4 % showed minimally active and 60.9% showed inactive.Among nursing students only 5.5% showed HEPA active, 35.4% showed minimally active and 59.1% are inactive. Correlation between BMI and total MET score showed increased BMI correlate with increased MET score.Therefore it seemed to be that obesed and overweight students make more activity than normal students.

VI. DISCUSSION

Approximately 5-10% of breast and ovarian cancer cases are due to an inherited susceptibility. (13).The majority of inherited breast and ovarian cancer susceptibility is due to mutations in the BRCA1 and BRCA2 genes. Germ line mutations in the tumor suppressor genes BRCA1 and BRCA2 predispose individuals to breast and ovarian cancers. The breast and ovary are estrogen-responsive tissues BRCA-mediated tumorigenesis are estrogen-mediated proliferation of breast and ovarian epithelium and the distinctive genomic context of the BRCA genes.(14)

In our study, total 12.34% give positive history of breast cancer in first degree relatives, 11.2% gives positive results in second degree relatives and 1.13% gives positive results in third degree relatives. Hartge et al. (1999) report an overall mutation frequency of 2.3%, in women diagnosed with breast or ovarian cancer at age <40 years who had at least one first-degree relative with breast cancer diagnosed at age <50 years. (15)William D.F et al stated that that family history is an important determinant of the probability of a mutation, in both unaffected and affected women. From our own study supports the conclusion that family history of breast cancer is an important factor in indicating the likely presence of a mutation in *BRCA1* or *BRCA2.* The lifetime risk of breast cancer among female mutation carriers was 82%.It is now known that germline mutations in BRCA1 represent a predisposing genetic factor in 15%–45% of hereditary breast cancers (depending on the population under study) and at least 80% of breast and/or ovarian cancers .Female mutation carriers have a 60%–80% lifetime risk for developing breast cancer and a 20%–40% lifetime risk for developing ovarian cancer *(16).*

Breast cancer poses a serious public health problem, and it is hoped that identification of genetic and environmental factors that contribute to the development of breast cancer will enhance prevention efforts. Two breast cancer susceptibility genes (BRCA1 and BRCA2) can be identified, and germ line mutations in these genes are thought to account for between 5% and 10% of all breast cancer cases.

Regarding history of ovarian tumour total 1.13% gives positive results in first degree relatives, 1.5% gives positive results in second degree relatives and 0.8% gives positive results in third degree relatives. Ovarian cancer varies widely in frequency among different geographic regions and ethnic groups. . The majority of cases are sporadic, and only 5% to 10% of ovarian cancers are familial. The most significant risk factor is a family history of the disease. Mutations in the BRCA1 and BRCA2 tumor suppressor genes responsible for the majority of hereditary ovarian cancer. Lifetime risks of ovarian cancer were 54% for *BRCA1* and 23% for *BRCA2* mutation carriers. Our findings support that there are definite risk factors for the students who gives history of ovarian cancer in their relatives. They can be identified and make follow up for further studies and prevention.

Related to Body mass index (BMI), 13.7% are underweight, 66.9% are normal, 14.7% are overweight and 2.5 are obese among 278 students. Over the past few decades, the proportions of populations that are overweight (body-mass index [BMI] 25–29 · 9 kg/m2) or obese (BMI≥30 kg/m2) have been increasing substantially worldwide. Excess bodyweight seems to be an important risk factor for some cancers. In women, a 5 kg/m^2 increase in BMI was weakly associated with postmenopausal breast cancer (1·12, p<0·0001). Though overweight and obesity may appear to be separate from physical activity, both constructs relate to energy balance (63). Maintaining an optimal level of energy balance—caloric expenditure relative to caloric intake—is associated with primary prevention of cancer. There appears to be a linear dose-response relationship between BMI and breast cancer risk-reduction from physical activity, with larger risk reductions occurring among women with lower BMI's. The risk reduction of breast cancer among from being physically active among four BMI groups, <22, 22.1–24.9, 25.0–29.9, and ≥30, were 27%, 24%, 18%, and 0.4%.Therefore in our study 14.5% and 2.5 % of the students can have risk reduction of 18 % and 0.4% respectively by doing physical activity. (17)

Physical activity is any movement using skeletal muscles (18). Physical activity can be categorized into four major subgroups. These subgroups include occupational (activity done at work), household (activity done at home), transport (activity done to commute), and recreational or leisure-time (activity done for enjoyment and/or pleasure); (19). To assess physical activity, there are four parameters estimated: frequency, intensity, time, and type. Frequency is the number of days per week dedicated to engaging in physical activity ($d \cdot wk^{-1}$). Physical activity can also be of varying intensities, including light, moderate, and vigorous intensity (20). Examples of activities with light, moderate, and vigorous intensities include housework, brisk walking, and running, respectively (21). Most epidemiologic studies measure intensity with METs, metabolic equivalents of energy expenditure, where 1-MET is sitting quietly, and 18-METs is running a <5 $min \cdot mile^{-1}$ pace (21). Time is the length of a single bout of physical activity, measured in minutes or hours ($min \cdot d^{-1}$ or $hr \cdot d^{-1}$). Type is the modality of physical activity, and frequently includes aerobic, strength and flexibility activities MET also is defined as oxygen uptake in ml/kg/min with one MET equal to the oxygen cost of sitting quietly, equivalent to

3.5 ml/kg/min. Regarding WHO recommendation for physical activity score, MET (Metabolic Equavilant Task) less than 600 is not meeting WHO recommendation.

In our study, by using International Physical Activity Questionnaire (IPQA)Score protocol,only 2.6 % of Medical students showed Health Enhancing Physical Activity (HEPA) active,36.4 % showed minimally active and 60.9% showed inactive. Among nursing students only 5.5% showed HEPA active, 35.4% showed minimally active and 59.1% are inactive. Consistent with observational evidence among physical activity and breast cancer risk, cohort studies estimate a 17% risk reduction in breast cancer when comparing the highest versus lowest levels of physical activity, RR=0.83 (95% CI: 0.78–0.88). The type of physical activity that provided the largest reductions in breast cancer risk were recreational, household, and occupational physical activity, with associated risk reductions of 21%, 21%, and 18%, respectively (22, 23). Interestingly, activities such as walking or cycling, used for transport, provided a more modest, 13% risk reduction in breast cancer (22, 23). When considering the intensity of physical activity needed to provide a reduction in breast cancer risk, both moderate and vigorous intensity physical activity provide significant reductions in risk, in the order of 15%, and 18%, respectively (23).However in our study 2.6% of Medical students and 5.5 % of Nursing students showed intense physical activity .When comparing women with a family history of breast cancer the risk reduction associated with physical activity is in the order of 1%, whereas the risk reduction among women without a family history of breast cancer is 21% (22, 23). The largest risk reductions in developing breast cancer through the use of physical activity were among women with estrogen and progesterone negative breast cancer, with a risk reduction of 27% (23).

The average risk reduction when comparing the highest versus lowest levels of physical activity is 25% (Figure 4). The International Agency for Research on Cancer (IARC) has categorized the association between physical activity and risk of breast cancer *convincing* (24).

The association between breast cancer risk and physical activity appears to be a linear dose-response relationship between BMI and breast cancer risk-reduction from physical activity, with larger risk reductions occurring among women with lower BMI's.In our study, correlation between BMI and total MET score showed increased BMI correlate with increased MET score. Therefore it seemed to be that obese and overweight students make more activity than normal students

Risk factors for ovarian cancer include genetic mutations, family history of ovarian cancer, previous breast, colon, rectum or uterine cancer diagnosis, nulliparity, and hormone replacement therapy for menopause (25, 26).

The pooled risk reduction among the 12 studies comparing the highest versus lowest levels of recreational physical activity yielded a significant 19% risk reduction, RR=0.81 (95% CI: 0.72–0.92); (26). The risk reduction of developing ovarian cancer associated with physical activity may be confounded by prior oral contraceptive use. (26). In separate subgroup analysis, when excluding four studies that did not adjust for BMI, the risk reduction was attenuated to 19%, RR=0.81 (95% CI: 0.76–0.86); such that the risk reduction of developing ovarian cancer associated with physical activity may be confounded by BMI (26). In our study none of the student gave history of taking oral contraceptive or hormone replacement therapy.

VII. Conclusion And Recommendation

Breast cancer was the most common cancer in females and also the first most common cancer among population regardless of sex in Malaysia (1). According to the National Cancer Registry, ovarian cancer is the fourth most common cancer among women in Peninsular Malaysia, making up five per cent of all female cancer cases. Approximately 7% of breast carcinomas and 10% of ovarian carcinomas result from alterations in genes that are passed down from either the mother or father .The majority (approximately 84%) of hereditary breast carcinomas result from inherited mutations in two genes, *BRCA1* and *BRCA2* [5]. For such women, evaluation of family history is an important screening tool to identify the possibility of hereditary breast and ovarian cancer risk .(7). In our study we can identify the positive history of breast and ovarian tumours in either their first degree or second degree or third degree relatives.

Overall, Malaysian women have poor survival from breast cancer and it is estimated that half of the deaths due to breast cancer could be prevented. It is both ironic and tragic that a neoplasm arising in an exposed organ, readily accessible to self-examination and clinical surveillance, continues to exact such a heavy toll.

We recommend future work to detect the presence of mutated inherited genes in those students with family history of breast and/or ovarian cancer. After genetic councelling personal risk factor can be identified and can consider risk-reduction or prevention option such as prophylactic mastectomy, chemoprevention and life style choices including 30 to 60 minutes per day of moderate- to high-intensity physical activity , staying at a healthy weight, and avoiding the use of post-menopausal hormone therapy.

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