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Aims and Scope of IJPHS

The International Journal of Public Health and Health Sciences (IJPHS) aims to publish original articles and contributions relevant to public health and medical sciences. IJPHS is published by the Praboromajchanok Institute for Health Workforce Development (PBRI), Ministry of Public Health, Thailand. It is a non-profit, peer-reviewed, open-access, international, scientific journal that publishes articles in areas of health sciences disciplines. The scope of the IJPHS is broad, covering the following categories: original articles, reviewed articles, special articles, case reports, correspondence, and others in the fields of public health, medical sciences and related allied health, especially the following areas:

- Health policy and management, health care and services
- Health promotion, health education and behavioral health
- Environmental and occupational health
- Health technology and data management
- Global health and Sustainable Development Goals(SDGs)
- Nursing and nursing sciences
- Community health, dental public health, community pharmacy, toxicology, and other relevant health issues of health and medical sciences.

Three issues will be published annually: January - April, May - August, and September - December. Authors from all areas of health and medical sciences are invited to submit scientific papers and contribute in this journal. Please find more details at <https://he01.tci-thaijo.org/index.php/ijphs/index>

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Editorial Statement

The COVID-19 infection expanded internationally and WHO announced a Public Health Emergency for international concerns. The manifests of COVID-19 showed several symptoms, ranging from asymptomatic and mild symptoms to severe illness and death. At present, COVID-19 is managed by available antiviral drugs to improve the symptoms, and in severe cases, supportive care including oxygen and mechanical ventilation is used for infected patients. According to the current data of WHO, the number of infected and dead cases has increased to 82.10 M and 1.79 M, respectively (Dec 2019 – December 2020). Given the high mortality rate and economic damage to various communities to date, great efforts must be made to produce successful drugs and vaccines against 2019-nCoV infection. Hopefully, we could get vaccinations for every citizens globally.

The editorial board of IJPHS sincerely hope that the members, faculty members, researchers, industrious students, medical, nursing and public health personnel as well as alumni who are interested in obtaining more detail from original articles, reviews, and other to use or transform research information into teaching and research fields. In this issue, IJPHS is consisting of four interesting topics covering public health and medical sciences which you can download articles in the journal at the website <https://www.tci-thaijo.org/index.php/ijphs>.

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*Original article**Received: Jan. 18, 2020;**Accepted: October 25 2020;**Published: Dec. 10, 2020***Factors Influencing the Preventive Health Behaviors and Mental Health among Type-II DM Patients at Upper North Region in Thailand**Kritsada Sarndhong¹ Thunyakorn Tonchonlakun²¹Faculty of Medicine, University of Phayao²Faculty of Science, Payap University**Abstract**

The dramatic increase in mental health problems is a common comorbidity in type-II diabetic DM (type 2) patients which if they lack of preventive health behaviors leads to severity of clinical consequence. **Objective:** The survey research aimed to study the preventive health behaviors and mental health of DM (type 2) patients, to examine factors associated with the preventive health behaviors and mental health of DM (type 2) patients and to examine factors associated with poor mental health of DM (type 2) patients. **Methodology:** Tools were the questionnaires on personal factors, the preventive health behaviors test developed by Numsri W. (2006) and the mental health test developed by the Department of Mental health. The reliability was 0.70 (KR-20) and 0.70 (Alpha coefficient), respectively. Data were analyzed using descriptive statistics, Chi-square test and Pearson's correlation was used to examine factors associated with the preventive health behaviors and mental health and also Binary logistic regression was used to analyze the data with a variable selection in Forward Stepwise (Likelihood Ratio: LR). **Results:** Overall, 52.98% of the subjects had high level of protective health behaviors and 47.8% of them had normal level of mental health. The significantly factors related to preventive health behaviors of DM (type 2) patients Iumien Tribe (non-Thai) and glycemic control ($p < 0.05$). There was the preventive health behaviors patients related to a mental health level of DM (type 2) as positive direction ($r = 0.366$) ($p < 0.01$). Besides, the significantly factors related to mental health of DM (type 2) patients were ethnic group, marital status and duration of the disease ($p < 0.05$) as well as the factors relating poor mental health of DM (type 2) patients were Thai group, Unmarried patients (single/divorced/ widowed/ separated), duration of DM more than 6 years and food control aspect, which could predict poor mental health level of DM (type 2) patients for 34.5% ($R^2 = 0.345$) and overall percentage of correct classification was 82.1%. **Discussion:** Appropriately dietary control method should be supported by particularly unmarried Thai Type-II DM Patients with duration disease over 6 years in order to make their mental health better. Another point, Should intensively promote a protective health behaviors into both Thai group and the group of inability controls the glucose level in order to avoid severity of clinical outcomes.

Keywords: Health protective behaviors, mental health, Diabetic Mellitus type 2**Corresponding author:** Kritsada Sarndhong E-mail: kritsada.cole11@gmail.com

Introduction

Diabetes is a serious condition of a chronic disease as global level where transfigure in the main driver in which insulin is generated and used. Insulin is a hormone that enhancing the uptake of glucose, by cells, to generate energy; it also patronizes the gather of glucose as glycogen and responsibility in lipid metabolism. Defect of insulin leads to the blood glucose levels to escalate, with potentially life threatening outcome. The nature of early sign often not obvious, that's why spotting them early can be slightly life- threatening which was resulting in an dramatic extends in the prevalent of disease affecting loss of life and funding for each country. In addition, this disease is a major public health concern. According to the International Diabetes Federation (IDF) estimated that in 2010 the five countries with the largest numbers of people with diabetes are India, China, the United States, Russia and Brazil. In addition, the estimated diabetes prevalence for 2010 is 285 million and is expected to affect 438 million people by 2030. (Boyle et. al, 2001) and 97 % of cases with type 2 diabetes will be a low and middle income countries facing the greatest burden of diabetes (Quin et. al, 2001).

Nowadays, the dramatic increase in overweigh is the main rout behind so many more people living with Type 2 diabetes in the Thailand. According to the annual statistics of Division of non-communicable division based on the Ministry of Public Health, in 2018 - 2020, there were prevalent of disease over 15 -60 years increasingly following a diagnosis of Type 2 diabetes as 840,489 876,970 and 941,226 cases respectively, according to our new analysis released today. As Thailand is current, population was about 425 million and by 2045 the Thai Ministry of Public Health predict that there will rise to 629 million prevalent cases seems like it is for a larger.

In addition, in 2019, there were 9,647 deaths from Diabetes, or an average of 27

cases per day. Mortality rate of Diabetes was 14.93 per 100,000 populations and there were 69,720 patients undergoing diabetes in the hospital under the Ministry of Public Health. The incidence of Diabetes was 1,081.25 per 100,000 populations (according to the fourth Thai Health Status Survey in 2008-2009). The prevalence of diabetes was 96% among those under age 15 seems too high and prevalence increase with age from 0.6% in the age group 15-29 years the highest prevalence was found in the 60-69 years old group; the prevalence of Diabetes was 67% higher in women than men. Importantly, found that 1 in 3 people with diabetes had never been diagnosed with Diabetes before (Absuwan et. al, 2015). Aside from that, people with diabetes are at increased risk of cardiovascular disease 2-9 times more than those without Diabetes (Sitthisook et. al, 1998) which was the leading cause of death in diabetic patients (Aekplakorn et al., 2003; American Diabetes Association (ADA), 2005). In addition, people with diabetes are 1.5-2 times as the risk of hypertension, 2-5 times as risk of cerebrovascular disease as compared to people without diabetes (Sitthisook et. al, 1998).

The greatest risk factor for developing type-II diabetic is age, sex, duration of disease, exercising, dietary, health preventive care and ethnicity can also contribute to someone's risk, with people of northern-Thai people or local people, descent two to four times more likely to develop Type 2 diabetes than ethnic (Tribe) people. Diabetes is also a cause of blindness (retinopathy), And estimated 5-10% of adults aged 65 or older have Diabetes, who was more risk of developing diabetes-related complications including hypoglycemia (low blood sugar), Eye problems (retinopathy), Kidney problems (nephropathy), Nerve damage (neuropathy)

(Hanutsaha et. al, 2008). About half of people with diabetes for over 25 years often with dementia due to diabetes and leads to amputation (Mitribukdi et. al, 1998). Including infections in the body, which can develop gradually, and can lead to serious damage as reticuloendothelial system if they go unchecked. Acute complications can happen at any time, (Satirapanya et. al, 2008).

In Chaing Rai province, Doi Loungh hospital has been screening diabetes risk in population regularly. According to the annual record, the incidence of Diabetes per 100,000 following Doi luang hospital databases in 2018 - 2020 increasing was 141.61, 133 and 182.41 respectively based on diagnosis of Type 2 diabetes. In addition, In 2020, we discovered that new found Diabetes cases has been increasing annually especially in Iumien or tribe group, lived in Doi luang village which 159 people had been tested diabetes risk and only 4 people was identifying diabetes patient.

Doi Loungh hospital has been screening diabetes risk in population regularly. According to the annual record, we did screen 74.46 %, 97.38 %, 92.73 % from all population in the area in 2016, 2017, 2018 respectively. In 2016, we found 271 diabetes people or 1411.61 from 100,000 populations. In 2017, we found 133 diabetes people or 578.38 from 100,000 populations. In 2018, we also found 35 diabetes people or 182.41 from 100,000 populations. We discover that new found diabetes rate has been decreasing annually especially in Iumien or tribe group, lived in Doi luang village which 159 people had been tested diabetes risk and only 4 people was identifying diabetes patient in 2018.

According to mental health statistic, the effect of globalization in Thai society from past to present has changed Thai culture excessively. The Thai population behavior becomes more city culture which more self-centers and faces more economical risks and competition all the times. It also changes

Thais to become less mercy and kindness. In this situation, any person who cannot adjust themselves to globalization have risk to have mental illness which leads to drugs problem, alcoholic, sexual disease, aggressive, anti-social, depression, suicide, and personal hygiene or health protective behavior.

The mental health has a direct impact on physical health. As similarly, poor mental health can negatively impact on physical health, leading to an increased risk of some conditions. There are various ways in which poor mental health has been shown to be detrimental to physical health. People with the highest levels of self-rated distress (compared to lowest rates of distress) were 32% more likely to have died from cancer.(Batty.G.D. et.al, 2017). Depression has been found to be associated with an increased risk of coronary heart disease.(Khawaja I.S., et.al, 2009) Moreover, People who have higher mental health level can manage stress better, which means they are less likely to develop mental illnesses like depression and anxiety.

According to the annual report of department of mental health, ministry of public health in 2015 to 2019 found that Chiang rai province which was ranked top 5th of Thailand's highest committed suicide increased steadily as mortality rate was 15.12, 14.2, 11.0 and 11.7 per 100,000 populations respectively (Department of Mental Health, Ministry of Public Health, 2018). Besides, the teenager group aged 10-19 years was higher committed suicide group increased steadily by continuing in 2008 - 2012 which was 225, 254, 265, 239 and 287 cases with the most common cause of the problem as health problems, school dropout and poor social interaction etc. (Office of the National Economic and Social Development Council, 2013), the statistics in 2008 to 2010 reported men was three time as committed suicide than women otherwise a women were three time as self-harm than men. Aside from that, The statistics of The World Federation Mental Health : (WFMH) showed 1 of 4 Diabetes

cases comorbid with depression affecting tended to have poorer self-care such as Dietary, Exercising and also Alcohol drinking which direct affected to occur complications leading to loss of body. As many related studies have shown similar associations. Diabetes patients were thirty time as tend to depression as nondiabetic group as well as finding 9% of depression based on using the interview for diagnosis of depression. Besides that, the prevalence of depression in Diabetes patients are tend to increase higher, which is consistent with the previous study both national and international (Anderson et.al, 2010; Ali et.al, 2006; Mesu et.al, 2008; Somporn et.al 2014), the majority of Type 2 diabetic group was risk of depression significantly higher than in nondiabetic group.

According to, reviewing literature in health beliefs and behaviors of different Tribe

group and areas at northern including Chiang mai, Chiang rai and also Mae Hong son found that the consumer culture of tribe differs the local northern person at Doi luang community. There are also other cultural beliefs that involved with health self-care as well as encouraging to Prevent Diabetes Miletus as health belief model implying the health belief based on the practice of individuals in the prevention of disease or intended cooperation in the prevention of the disease, and the contributing factors that lead to the need for the health of the community (Jinathum et. al, 2008; Foofueng et. al, 2019). From the above situation, the researcher team interested to study health protective behavior of Diabetic Mellitus type 2 of tribe groups of Doi Luang in order to apply the results of study for the design of health care systems to improving improve the health better and wellbeing of DM patients people Doi in Luang area, Chiang rai.

Research Methodology

Study population, sample and sampling method

The study was a cross-sectional descriptive study design. The sample of this research was calculated by using TaroYamane (Yamane, 1973) formula with 95% confidence level (according 628 cases of DM (type 2) patients who were treated for 1 year and aged greater than or equal to 35 years old following the standard diagnoses criterion of type-II diabetic of the Clinical Development Guideline for Quality NCD (Diabetes and Hypertension)(Ministry of Public health, 2015), those database from of Doi Luang Hospital,Chiang Rai, Thailand,

2018. As after calculated, the sample sizes of at least for this study was 245 cases following show in figure.1, In order to decrease the error in the study and so far, we has adjusted sample size as 251 cases.

The inclusion criteria were having type 2 diabetes, age between 35 -75 years; and blood glucose does not exceed 300 mg dl. The patients were excluded if being treated with insulin; having severe complications such as renal failure, gangrene, or psychologically ill; and resting systolic blood pressure over 200 mmHg.

Sample Size (n)

$$N = 628, e = 0.05$$

$$\begin{aligned} n &= \frac{N}{1 + Ne^2} \\ &= \frac{628}{1 + (628)(0.05)^2} \\ &= \frac{628}{1 + (628)(0.0025)} \\ &= \frac{628}{1 + 1.57} \\ &= \frac{628}{2.57} \\ n &= 244.35 \sim 245 \end{aligned}$$

Figure 1. Formula used for sample size calculation

Research questionairs

For the study, questionnaire is used as the research instrument, the questionnaire form consists of 3 sections; they are;

Section 1: personal information by using multiple choice questionnaires

Section 2: The preventive health behaviors test developed by Numsri W. (2006) as show in figure 2. The methods of data collection are questionnaire through interview. The characteristics of this section use a check-list question as follows;

Score	Means
1	Correct answer
0	Wrong answer or Don't know

HEATH PREVENTIVE BEHAVIOR QUESTIONNAIRE		
	YES	NO
EXERCISE ASPECT;		
1. Not only I did house cores, but I also regularly do exercises as 3 time per week	<input type="radio"/>	<input type="radio"/>
2. I always do warm up and relax my body prior work out	<input type="radio"/>	<input type="radio"/>
3. I decided to choose a right kind of exercise activity into my age and my health	<input type="radio"/>	<input type="radio"/>
DRUG USE AND CLINICAL MONITORING ASPECT;		
1. I always have a follow; up doctor's appointment at NCD clinic	<input type="radio"/>	<input type="radio"/>
2. I always did not eat or drink at least 8 – 10 hours or with in 12 p.m. prior to the check-up.	<input type="radio"/>	<input type="radio"/>
3. When I have a follow; up doctor's appointment, I was checked a blood sugar more frequently by doctors or medical staff	<input type="radio"/>	<input type="radio"/>
4. Although I was sick, I regularly still intake a Diabetes drug	<input type="radio"/>	<input type="radio"/>
HEALTH SELF-CARE ASPECT;		
1. I always have shower with water and soup as 1-2 time per day	<input type="radio"/>	<input type="radio"/>
2. I always wipe with cotton on my body particularly a foldable join area to reduce wetness	<input type="radio"/>	<input type="radio"/>
3. I regularly do checkup an Ingrown Toenail, burn wound, abrasions wound and a wound on my feet. If I discover it I will see a doctor immediately	<input type="radio"/>	<input type="radio"/>
PREVENTION DISEASE AND TREATING COMPLICATION ASPECT;		
1. I didn't hold in my bladder longtime	<input type="radio"/>	<input type="radio"/>
2. Whether I have a blood sugar level as higher than 140 mg/dL or Urinary Frequency Daytime, thirsty and Xerostomia, I will control my sugar dietary Whether I have a Sweating, arrhythmias and also Fainting (syncope) or near fainting, I will intake candy or sugary foods immediately	<input type="radio"/>	<input type="radio"/>
3. When my forefoot changes skin color or skin discoloration as purple color, I will see a doctor immediately	<input type="radio"/>	<input type="radio"/>
4. I regularly avoid having bare feet walking outside	<input type="radio"/>	<input type="radio"/>

Figure 2. A sample of the preventive health behaviors test

The questionnaire consists of 34 items, which divided into 5 aspects as follows;

- 1) Food control aspect; with 34 items (10 score)
- 2) Exercise aspect; with 6 items (6 score)
- 3) Drug use and clinical monitoring aspect; with 6 items (6 score)
- 4) Health self-care aspect; with 7 items (7 score)
- 5) Prevention disease and treating complication aspect; with 5 items (5 score)

Interpreting level of the preventive health behaviors was done by compared criteria as follows;

Score	Level of the preventive health behaviors
24 – 34	High level
12 – 23	Moderate level
0 - 11	Low level

Section 3: The Mental Health test developed by the Department of Mental health, Ministry of Public Health and the characteristics of this section use a rating scale with 15 items as show in figure 3. The rating scale is set by Likert, which were divided as follows;

Type of worded items	Criteria			
	Absolutely agree level	Agree level	Indifferent level	Disagree level
Positive-worded items (12 items)	4	3	2	1
Negative-worded items (3 items)	1	2	3	4

Interpreting level of the mental health was done by compared criteria as follows;

Score	Level of the mental health
51- 60	High level
44 - 50	Normal level
Less than or equal to 43	Poor level

GENERAL HEALTH QUESTIONNAIRE (GHQ-12)				
	Strongly Agree	Agree	Neutral	Disagree
1. Felt you are perfectly enjoy normal day-to-day life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Been feeling reasonably happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Been getting a feeling of hopeless and boring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Felt feeling low-self esteem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Felt able to face in your problem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 3. A sample of The Mental Health test

Study validation

A structured content of questionnaire was developed to collect the data from the DM type 2 patients which included socio. Demographic information, body mass index: BMI, HbA1C, and diabetes selfcare behavior. The questionnaire was validated by experts in health behaviors and medical, nutrition, and exercise; field tests for reliability were carried out in these two districts where are nearby

Doi luang district but not in the study areas. The reliability of the preventive health behaviors test was 0.70 by Kuder-Richardson's Method (KR-20) and the reliability of the mental health test was 0.70 by Cronbach Alpha Coefficient (α -Coefficient).

Data collection

In this study, the probability sampling method was used. The sampling method was systemic random sampling by interviewed

Type-II DM Diabetic Mellitus patients who accepted to participate in this study from October 2018 – February 2019.

Data management and analysis

Data were analyzed using descriptive statistics such as frequency and percentage to explain the factor and using Pearson's correlation to assess the correlation between the preventive health behaviors score and the mental health score. Chi-Square test was used to examine factor associated with the preventive health behaviors level and mental health level of DM patients. Binary logistic regression was also used to examine factors associated with poor mental health level of DM patients and use the Forward Stepwise

(Likelihood Ratio: LR) to analyze the data with a classification table method of variable selection, which is method to evaluate the predictive accuracy of the logistic regression model. As observed values show the dependent outcome and the predicted values (at a user defined cut-off value as $p = 0.50$) are cross-classified. In part of predictive accuracy was considered through the percentage of prediction which if percentage of prediction too high means an predictive accuracy in equation will have a high too.

Ethical concerns

Ethical considerations the study protocol was approved by the Ethics Committee, School of Medicine, University of Phayao (2018)

Study Design

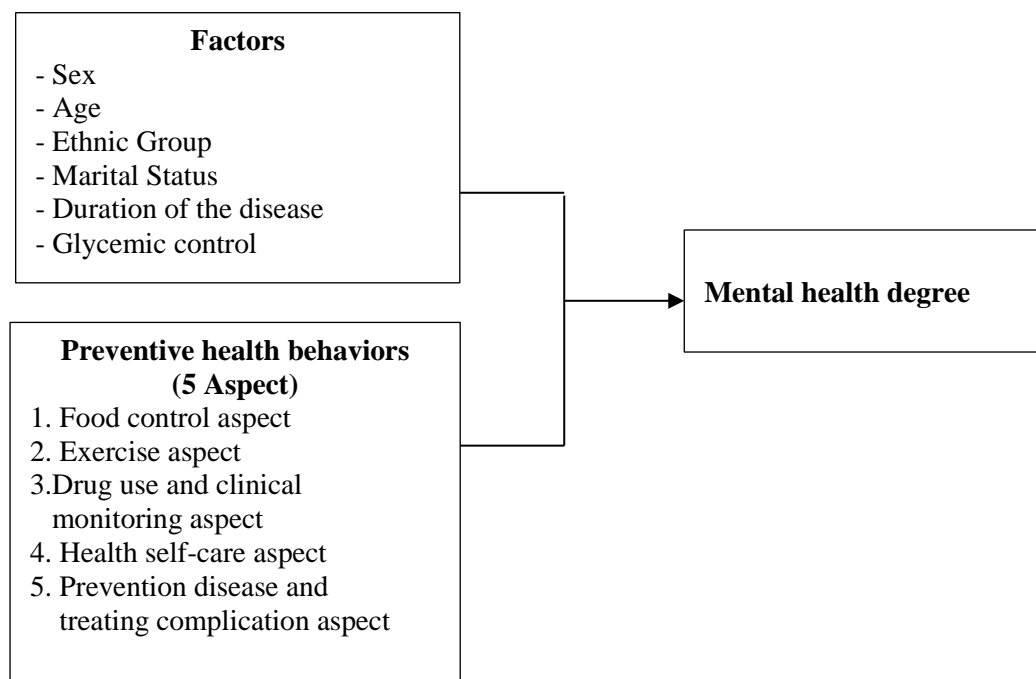


Figure 1: Conceptual Framework

Results

Most of Type-II DM Diabetic Mellitus patients was female (64.5%), married (71.7%), age < 60 years (54.2%), had Thai

ethnicity (70.5%), had DM for a duration 6 – 10 years (47.7%) and were in the controlled blood sugar group (64.9%) as show in Table 1.

Table 1. Frequency and percentage of factors

Factors		Frequency (n=251)	Percentage
Sex	Male	89	35.45
	Female	162	64.55
Age	< 60 years	136	54.18
	≥ 60 years	115	45.82
Ethnic group	Thai	177	70.52
	Iumien Tribe (non-Thai)	71	29.48
Marital status	Unmarried (single/ divorced/ widowed/separated)	71	28.28
	Married	180	71.72
Duration of disease	0 – 5 years	81	32.30
	6 – 10 years	119	47.70
	> 10 years	51	20.30
Glycemic control	Controlled blood sugar	163	64.94
	Uncontrolled blood sugar	88	35.06

The preventive health behaviors level and the mental health level

Most of Type- II DM Diabetic Mellitus patients had a high and moderate level of preventive health behaviors.

Only a small percentage had low levels of preventive health behaviors as show in Table 2.

Table 2. Frequency and percentage of the preventive health behaviors

The preventive health behaviors level		Frequency (n=251)	Percentage
	Low	4	1.60
	Moderate	114	45.42
	High	133	52.98
	Total	251	100.0

Most of Type-II DM Diabetic Mellitus patients had a normal or high (above normal) level of mental health. Only about a

quarter of patients had a poor (below normal) level of mental health as show in Table 3.

Table 3. Frequency and percentage of the mental health

The mental health level	Frequency (n=251)	Percentage
Poor	64	25.50
Normal	120	47.81
High	67	26.69
Total	251	100.0

Personal factors related to the preventive health behaviors level

The results of the personal factors significantly related to protective health behaviors of DM (type 2) patients were ethnic group and glycemic control (p-value < 0.05) as show in Table 4.

Table 4. χ^2 (p-value) of the preventive health behaviors related factors of DM Type-II patients

Factors	Preventive health behaviors level (n=251)			P-value
	low	moderate	high	
Sex				
Male	2(2.2%)	41 (46.1%)	46 (51.7%)	0.811
Female	2 (1.2%)	73 (45.1%)	87 (53.7%)	
Age				
< 60 years	2(1.5%)	65 (47.8%)	69 (50.7%)	0.793
≥ 60 years	2 (1.7%)	49(42.6%)	64 (55.7%)	
Ethnic group				
Thais	4 (2.3%)	90 (50.8%)	83 (46.9%)	0.010*
Iumien Tribe (non-Thai)	0 (0.0%)	24 (32.4%)	50 (67.6%)	
Marital status				
Unmarried (single/ divorced/ widowed/separated)	3 (4.2%)	34 (47.9%)	34 (47.9%)	0.075
Married	1 (0.6%)	80 (44.4%)	99 (55.0%)	
Duration of disease				
0 – 5 years	0 (0.0%)	38 (46.9%)	43(53.1%)	0.753
6 – 10 years	3(2.5%)	53(44.5%)	63(52.9%)	
> 10 years	1(2.0%)	23 (45.1%)	27 (52.9%)	
Glycemic control				
Controlled blood sugar	1(0.6%)	66 (40.5%)	96(58.9%)	0.014*
Uncontrolled blood sugar	3 (3.4%)	48 (54.5%)	37 (42.0%)	

*Significance at 0.05 level

Personal factors related to mental health level

The results of the personal factors significantly related to mental health of DM (type 2) patients were ethnic group, marital

status and duration of the disease ($p < 0.05$) as show in Table 5.

Table 5. χ^2 (p-value) of mental health related factors of DM Type-II patients

Factors	Mental health level (n=251)			P-value
	poor	normal	high	
Sex				
Male	18(20.2%)	44 (49.4%)	27(30.3%)	0.322
Female	46 (28.4%)	76 (46.9%)	40 (24.7%)	
Age				
< 60 years	39 (28.7%)	62 (45.6%)	35(25.7%)	0.453
≥ 60 years	25 (21.7%)	58(50.4%)	32 (27.8%)	
Ethnic group				
Thais	60 (33.9%)	85 (48.0%)	32 (18.1%)	<0.001**
Iumien Tribe (non- Thai)	4 (5.4%)	35 (47.3%)	35 (47.3%)	
Marital status				
single/ divorced/ widowed/separated)	26 (36.6%)	33 (46.5%)	12 (16.9%)	0.015*
Married	38 (21.1%)	87 (48.3%)	55 (30.6%)	
Duration of disease				
0 – 5 years	8(9.9%)	48(59.3%)	25(30.9%)	<0.001**
6 – 10 years	36(30.3%)	46(38.7%)	37(31.1%)	
> 10 years	20(39.2%)	26(51.0%)	5(9.8%)	
Glycemic control				
Controlled blood sugar	40(24.5%)	85 (52.1%)	38 (23.3%)	0.136
Uncontrolled blood sugar	24 (52.1%)	35 (39.8%)	29 (33.0%)	

*Significance at 0.05 level; **Significance at 0.01 level

Correlation between mental health and preventive health behaviors

The results of relationship between mental health score and the preventive health behaviors score was 0.366 (p-value < 0.01) which imply to the protective health

behaviors score is increase, the mental health score will increase following at positive direction as Scatter Plot between mental health score and the preventive health behaviors score as show in Figure 5.

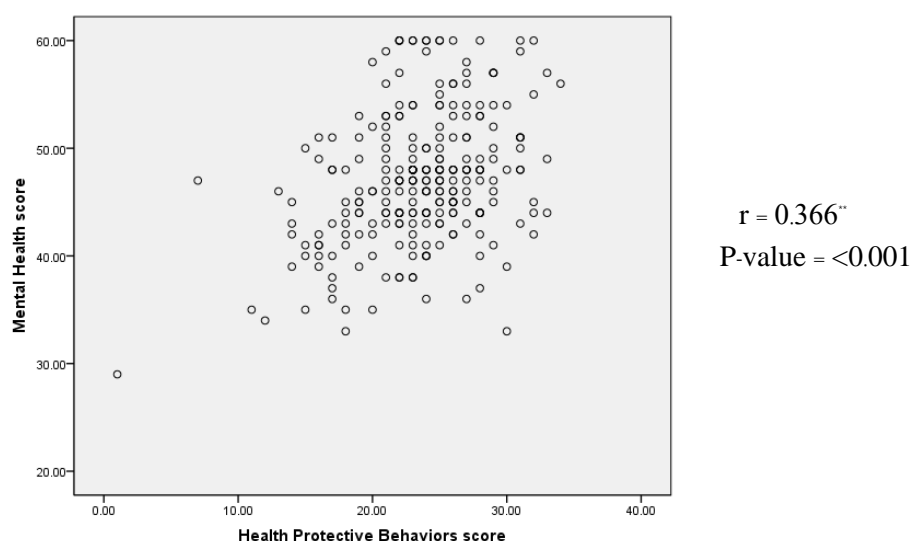


Figure 5. Scatter Plot between mental health score and the preventive health behaviors score

Factors associated affecting mental health

In Table 5. There was variables including ethnic group, marital status and also duration of disease showed statistically significant associations with mental health level. Interestingly, the percentage of participants with a poor level of mental health was six times higher among participants with Thai ethnicity compared to the Iumien tribe ethnicity. Also, the percentage of participants with poor mental health was higher among the unmarried compared to the married participants. In terms of the duration of having DM, patients with the DM for 5-10 years and disease greater than 10 years had percentages

of poor mental health that were triple that of patients with DM for less than 5 years.

Thus, we analyzed the relationship between these three variables (ethnic group, marital status, and duration of disease) and health preventive behaviors (5 aspects) with mental health status using the Binary Logistic Regression model. We used mental health as a dichotomous variable (not poor mental health versus poor mental health). We combined high and normal mental health together to create the variable “not poor mental health.”

Assessing for Model Coefficients using forward stepwise variable selection

74.5 % of sample were correctly classified using only, the null model, which contained

no independent variables, as shown in Table 6.

Table 6. The observed and predicted classifications in Beginning Block. (Block 0)
Beginning Block

		Classification Table ^{a,b}			
Observed		Predicted			
		Poor Mental Health		Percentage Correct	
		Not Poor Mental Health	Poor Mental Health		
Step 0	Poor Mental Health	Not Poor Mental Health	187	0	100.0
		Poor Mental Health	64	0	.0
Overall Percentage					74.5

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.072	.145	54.818	1	0.000	0.342

Note: Block 0 assesses the usefulness of having a null model, which is a model with no independent variables.

We added selected independent variables (ethnicity, marital status, duration of disease and food control aspects to the model. Table 7 shows the result of the Omnibus Tests of Model Coefficients and the Likelihood Ratio (LR) test. These tests indicate whether

the inclusion of this block of variables contributes significantly to improving model fit. In Table 7, the p-value significance of less than 0.05 for block meant that the block 1 model was a significant improvement to the null (block 0) model.

Table 7. Omnibus Tests of Model Coefficients (Block 1: Method = Enter)

Omnibus Tests of Model Coefficients				
		Chi-square	df	P-value
Step 1	Step	75.428	9	<0.001
	Block	75.428	9	<0.001
	Model	75.428	9	<0.001

Note : Block 1 shows the results after the addition of independent variables selected.

In the case of a good model assessment, it is determined from the percentage of correct classification significantly increase derived from the addition of independent

variables. The correct classification rate has increased by 74.5% as (Table 6/Block 0) to 82.1% as show in Table 8 (Table 7/Block 1)

Table 8. The observed and predicted classifications in Block 1.

Classification Table^a

			Predicted		
			Poor Mental Health		Percentage Correct
			Not Poor Mental Health	Poor Mental Health	
Observed					
Step 1	Poor Mental Health	Not Poor Mental Health	174	13	93.0
		Poor Mental Health	32	32	50.0
	Overall Percentage				

a. The cut value is .500

In this section, we discussed as model summary, in order to identify variables associated with poor mental health level using binary logistic regression model. Next, we examined personal factors with strong associations with mental health level (ethnic group, marital status and duration of the disease) and the preventive health behaviors (food control aspect, exercise aspect, drug use and clinical monitoring aspect, health self-care aspect and prevention disease and treating complication aspect). We were interested which factors associated with mental health as poor level more by using binary logistic regression with a variable selection in forward stepwise method (Likelihood Ratio: LR). The forward stepwise method (Likelihood Ratio : LR) consisted of an entry testing based on the significance of the score statistic , and removal testing based on the probability of likelihood-ratio statistic based on maximum partial likelihood estimates.

The results of variable selection in Forward Stepwise method (Likelihood Ratio: LR) found that the factors significantly related to mental health level of DM (type 2) patients were Thai group has mental health level rather than tribe group to 7.730 times. (OR =

7.730, 95% CI = 2.564-23.301) , unmarried patients (single/ divorced/ widowed/separated) has poor mental health level rather than couple patients (married) to 2.047 times (OR = 2.047, 95% CI = 1.010-4.151), duration of the disease 6-10 years patients has poor mental health level rather than duration of the disease 0-5 years patients to 4.085 times (OR = 4.805, 95% CI = 1.942-11.891), duration of the disease more than 10 years patients has poor mental health level rather than duration of the disease 0-5 years patients to 6.699 times (OR = 6.699, 95% CI = 2.407-18.645) and food control aspect is a protective factor, which leads to 27% lower risk of poor mental health level (OR=0.73, means $1-0.73=0.27$ or 27% lower risk), which if patient group has the preventive health behaviors in food control aspects too high affects their poor mental health will have low too as 27% compared to those with another preventive health behavior.

The results founded that these factors could predict mental health level of DM (type 2) patients for 34.5% (Nagelkerke $R^2 = 0.345$) and overall percentage of correct classification was 82.1% show in Table 9.

Table 9. Variables in the equation by binary logistic regression (Forward Stepwise method)

Factor	B	S.E	Wald	df	Exp (B)	95%CI for Exp (B)	p-value
Unmarried	0.717	0.361	3.949	1	2.047	1.010 - 4.151	0.047
Duration 6 - 10 y	1.570	0.462	11.530	1	4.805	1.942 - 11.891	0.001
Duration > 10 y	1.902	0.522	13.262	1	6.699	2.407 - 18.646	0.000
Food control aspect	-0.311	0.078	15.977	1	0.733	0.629 - 0.853	0.000
Thai group	2.045	0.563	13.198	1	7.730	2.564- 23.301	0.000
Constant	-2.090	0.834	6.282	1	0.124		0.012
Over rate of correct classification = 82.1%. $R^2 = 0.345$							

Discussion

The Preventive Health Behaviors in Type 2 DM Patients

Overall, 52.98% of the subjects had high level of protective health behaviors and 47.8% of them had normal level of mental health. The personal factors significantly related to protective health behaviors of DM (type 2) patients were ethnic group and glycemic control ($p < 0.05$) According to the study, most of the populations were adults and elderly, which corresponds to the incidence of metabolic disorders and found that the disorder can occur at any ages. But the rate of illness is over 60 years, followed by 45-60 years, 30 - 44 years, and below 30 years respectively. (Diabetes Association Of Thailand Under The Patronage Of Her Royal Highness Princess Maha Chakir Sirindhorn,

The Endocrine Society of Thailand et. al, 2011; Arbsuwan et. al, 2015). The sample group has a health protective behavior as moderate level and the majority of the population is employed in agriculture. As a direct interview process of researcher team found that their life style is quite unchanged from the past, rarely accept modern technology or innovation. Most lifestyles are sufficiency, living with a low cost of living. Most of the the sample group are extended families, who supportive of each other. Most of the the context is consistent with the natural way, for instance, self-cooking by using organic ingredients.

The Mental Health in Type 2 DM Patients

The living area is surrounded by nature and is far away from source of pollution whether the industrial factory that discharges various waste (Jinathum et. al, 2018). Although the sample group is located in a remote area of Chiang Rai province. Proactive work and patient monitoring in remote areas of health professional team continue to work seriously at every moment.

Care and monitoring of patients is not just physical care, but there are also social and psychological care which called holistic health care (Worabutr et. al, 2017; Jinathum et. al, 2018). As a result, the sample group in Doi Luang District has good health care behaviours and good mental health as the previous study (Wearbuezhia et. al, 2008; Suriart, et. al, 2014) found that prisoners, who

have metabolic disorders have health protective behaviour level as moderate. In terms of mental health, which is consistent

with the previous study (Latiffah et.al, 2005; Tasuwanin et.al, 2008; Suriyawong et.al, 2011)

The related factor of preventive health behaviors including;

Ethnic group (Ioumien)

Ethnic group, who is Diabetic Mellitus type 2 in Doi Luang area, will receive medicines at Doi Luang hospital and Health promoting hospital. The important point that Ethnic group have a higher level of health protective behavior than normal Thais group is the proactive operation of health professional team from Doi Luang Hospital for remoted areas by monitoring with Holistic

health care. And another point, Ethnic group is self-employed in agriculture. As for Thai group, they will work as agriculture in terms of employees who must work in accordance with their employers, which sometimes results in the inability to leave for follow-up treatment that can cause lack of treatment (Tasuwanin et.al, 2008)

Glycemic control

Glycemic control patients have health protective behavior higher than inability of Glycemic control patients. Referring to practical following to clinical guidance of diabetes is not only following by clinical guidance but it is also important for dietary behavior and exercise.

The result of this study showed that exercise factor of the samples group will be lower than normal. Not only have the patients who have health protective behavior during the treatment of diabetes but they also had to control the sugar blood level. The majority of sample group thinks that they can control their sugar blood levels by take medicines regardless to appropriate dietary consumption and exercise properly (Foofueng et. al, 2019).

There was a relationship between the preventive health behaviors of DM (type 2) patients and a mental health level ($r = 0.366$) ($p < 0.01$) As is evident from, Preventive health behaviors related with mental health level of this study is significant and found that majority of sample group, had both moderate level of Preventive health behaviors and normal level to high level of mental health level. Referring to my previous argument, the influence of mental health affects moods, affects, thought and reactions to various situations in their life which if they have good mental health, will be able to manage with any problems better consciously

The related factor of mental health including;

Thai group

In Doi Luang District, which is considered as a rural area and there are language restrictions, because they lack of translation of health information into the native Ioumien tribal language. As Thai patients also facing barriers to reading the health information due to educational level or illiteracy. Therefore, causing lack of awareness and perceived health status. As a result, most of the Thai group refuses to

accept they are chronic disease (Jinathum et. al, 2018; Foofueng et. al, 2019). Therefore, the group have methods of looking at illness from spiritual things. And another point is Thai group refuses to acknowledge that they are ill which can cause that group to be less aware of the risk and violence (Katon et.al, 2004; Pulphonhub et.al, 2005; Walaiporn et.al, 2009; Egede et.al, 2010; Kamble et.al, 2012).

In conclusion, our nationally representative data show that Indians and, more strikingly, Pakistanis had significantly increased odds of suboptimal control than the White Scottish population both before and after adjusting for potential confounders, whereas proportions with suboptimal glycaemic control were similar to the Scottish population in Chinese or African-Caribbean

Duration of the disease

Duration of exposing disease longer affected with the risk of have mental health problems higher, which is consistent with the previous study both national and international (Suppaso et.al, 2010; Egede et.al, 2010; Ali

Alone patients

According to the study, Couple group have a higher level of mental health than alone group (single/divorced/widowed/separated), is probably majority of the couple group have a spouse who is also reassurance of each other's both

Food control aspect

The majority of sample population is an agriculture in rapid social change, as for both group, they will work as agriculture in terms of employees who must work in accordance with their employers, which sometimes results in these group spending time working hugely to earn a living under

Research Implication

The results of these study can be used to guide the practice of protective health behaviors particularly focusing on appropriately dietary control into relevant institutions, which have to work with a Thai DM type 2 patients who is an inability to glycemic control as moderate level. Second,

Suggestions for the future study

In the further study, Researcher teams should study as qualitative study of the preventive health behaviors and mental health into Thai DM type 2 patients for more deeply understand. In addition, should analyze the related factors as form of the equation as well as to should analyze the

groups. The role of other factors such as treatment-specific responses, physician to patient communication as way to improve glycaemic control in South Asians and the association between glycaemic control and complications of diabetes including hospital admissions are clearly relevant areas for future research.

et.al, 2006; Kitkaw et.al, 2011), which found the majority of patients group who perceive a violence of illness are risk of have mental health problems higher than those who didn't perceive a violence of illness.

physical and mental while those alone group is quite an independence person, lack of companion in life and also being desensitized by self, which sometimes results in their mental health (Somboonsit et.al, 1992)

both pressure and stressor resulting an inability to food control appropriately for disease, which direct affects glycemic control level and risk of severe complication highly into their body soon (Kaengrang et.al, 2017)

these result is also applicable to the development of mental health promotion strategy into a Thais DM type 2 patients who have been exposed greater-than or equal to 6 years of this disease and have lived alone.

composition to determine the factors affected protective health behaviors and mental health into DM type 2 patients in order to improve the activities of both protective health behaviors and mental health which correspond to the context of the patient more.

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Original article

The Performance of Microdermabrasion Machine Based on Vacuum Pressure Drop

Rita Sundari, Aji Bagaskara, Rini Anggraini

Department of Mechanical Engineering, Faculty of Engineering,
Universitas Mercu Buana, Jakarta

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Abstract

Microdermabrasion in cosmetic field is a mild process in relation to treatment of human facial skin by removing any dead and damage cells, fat spots or impurities adhered to human face. A sudden malfunction of working operation of microdermabrasion machine has been found as significant problem, which is expected due to motor blockage in the machine affected the machine performance that in turn causing shorter machine lifetime. The motor blockage in the machine has been investigated that is usually caused by accumulation of fats or impurities hindering the motor operation. Before using an air filter in its vacuum system it is reported that the efficiency of machine lifetime is only about two months based on five times usage daily, however, after applying the air filter installed in the machine the lifetime getting increased to six months with same frequency of daily use. This investigation is emphasized on the role of air filter in the vacuum system applied to microdermabrasion machine in order to prolong the machine lifetime.

Keywords: Air filter; lifetime; machine; microdermabrasion; vacuum pressure

Corresponding author: sundaririta15@gmail.com;rita.sundari@mercubuana.ac.id

Introduction

Microdermabrasion is an act of mechanical exfoliation used for aesthetical purposes corresponding with removal of superficial epidermal layer Fak, M. et al, (2018); Savardekar, P. (2007). In cosmetic field, the microdermabrasion machine is used to remove acne scars, stretch marks and overcome photoaging and hyperpigmentation related to facial treatment. According to Samantha et al., (2011) the application of microdermabrasion is effective for skin therapy and also aiding skin treatment due to scars and keloids Mariane, F., et al. (2014). In addition, microdermabrasion technology has become increasingly popular for skin rejuvenation and exfoliation Sadick, N. & S., Finn, N. A. (2002).

Microdermabrasion machine was first introduced for skin therapy in 1985 Domyati, M. et al, (2016). According to Samuel and Robert Samuel, J. B. & Robert, W. B. (2000), the patient skin has to be cleaned, dried and freed from all make-up and any oil before starting the facial treatment. The technique of microdermabrasion machine has several methods using mechanical abrasion made of jets of zinc oxide or aluminum oxide crystals, fine organic particles, or a roughened surface. Recent

microdermabrasion machines are provided for more than one method. More than 100 types of microdermabrasion machine are available in market Mahony, M. (2014).

So far, many articles of microdermabrasion issues have only reported from the viewpoint of cosmetic importance referred to the application of the device. Up to date, investigation on microdermabrasion machine performance especially referred to technical obstacles has not been reported yet and therefore, this preliminary study attempts to present the drawback of microdermabrasion machine from the standpoint of technical matter.

This study uses microdermabrasion, a portable machine namely *Athena Exfoliator* to investigate the technical matter with respect to machine operation regarding machine lifetime and part of component application. The investigation emphasizes on the effect of air filter installed in vacuum channel of this machine and then correlated with machine lifetime. The type of machine applied in this study does not use any abrasive crystal and therefore, this is the benefit of this machine type resulting as preference for many users. In addition, it does not use any disposal product in relation to reduction of economic expense.

Experimental

The experiment was implemented on the portable microdermabrasion machine that consisted of several steps as follows: (i) preparation of instrumentation, (ii) measurement of vacuum pressure with a vacuum gauge, (iii) disassembly of microdermabrasion machine, (iv) cleaning

machine motor and vacuum channel, (v) installing and connecting air filter with vacuum channel, (vi) re-measurement vacuum pressure with a vacuum gauge using air filter installed to the machine, and (viii) data collection and analysis.

Operation of microdermabrasion machine

In order to operate the microdermabrasion machine, the hand piece part provided with a tip pasted directly to surface of facial skin. The machine tip is

installed at the edge of hand piece that integrated to the machine by a connecting pipe.

Table 1. Characteristics of microdermabrasion machine “*Athena Exfoliator*” .

Parameter	Characteristic
Voltage (AC)	220-230 V
Frequency	60/50 Hz
Current	1 x 5 Amp
Vacuum pressure	<i>Mild</i> (< - 26 cm Hg) <i>Strong</i> (> - 41 cm Hg)
Size	255mm x 238mm x 135mm
Weight	5 kg
Length of connector pipe	125 cm

The tip has rough surface to abrade skin dead/damage cells. There is a hole in the middle part of the tip to absorb all fats and dead/damage cells from human facial skin. The tip has to be sterile to assure the skin safety of user.

The specification of microdermabrasion machine “*Athena Exfoliator*” used in this study corresponding with its voltage, frequency, electrical current, vacuum pressure, size and weight of machine, as well as length of connecting pipe, which is shown in Table 1.

2.2 Main components of microdermabrasion machine

The main parts of microdermabrasion machine include:

1. Vacuum Motor
2. Main Board
3. Pressure regulator valve (solenoid valve)
4. Electric switch

The function of each component is as followed: (i) Vacuum Motor – This component consists of coil emitting electromagnetic wave in order to rotate the rod. The two ends of its rod are wheels to change direction of rotation to alternate movement; (ii) Main Board – This control

panel is to manage function of all components of the microdermabrasion machine such as to control the function of vacuum motor and pressure regulator valve; (iii) Pressure regulator valve (Solenoid valve) – The function of pressure regulator valve is to arrange the vacuum pressure that classified into two criteria, i.e. *mild* (< - 26 cm Hg) and *strong* (> - 41 cm Hg) pressures; and (iv) Electric switch – The electric switch uses electromagnetic wave to manage low electrical current related to low power that can produce moderate electrical voltage.

Results and Discussion

Data collection are recorded and obtained from vacuum pressures on the basis of every 4 weeks, which the vacuum pressures were continually weakened during 12-week observation both for *mild* and *strong* criteria. The capability of vacuum motor in microdermabrasion machine was both reduced by 11 pressure unit (cm Hg) for *mild* criteria (from 26 to 15 cm Hg) and

22 pressure unit for *strong* criteria (from 50 to 28 cm Hg) in 12-week observation (data not shown here).

The significant reduction of vacuum pressure gives conclusion that there is any troublesome with the vacuum motor assumed to be corresponding with any blockage in the vacuum channel probably caused by accumulation of dead/damage

cells from human facial skin and impurities in the vacuum cavity.

Furthermore, it seems that the reduction of vacuum pressure in *strong* category is about doubled that one of *mild* category during weeks of observation. It is

probably in relation to larger vacuum pressure in *strong* category yielded stronger suction effect on drawing fat impurities and dead skin cells from human facial skin yielding more accumulation in vacuum cavity.

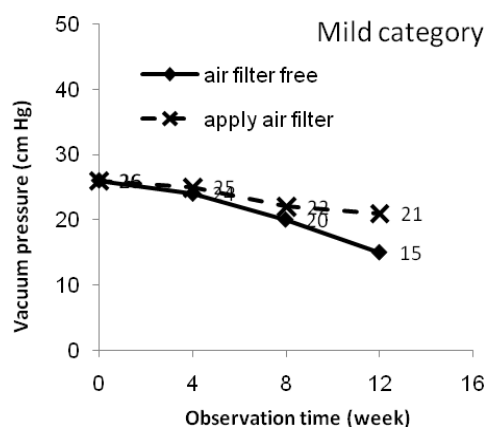


Fig 1. Microdermabrasion machine for *mild* category (< - 26 cm Hg).

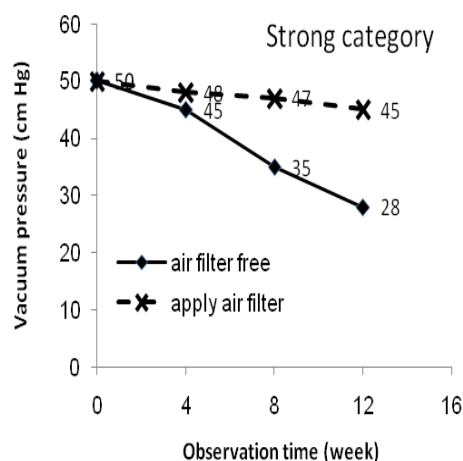


Fig 2. Microdermabrasion machine for *strong* category (> - 41 cm Hg).

In order to overcome this obstacle the machine and vacuum cavity need to be cleaned regularly and this machine becomes more sustainable. This problem generates an idea to diminish the accumulation effect of impurities by providing an air filter in the

vacuum channel. It is assumed that the air filter can resist any fat impurities and dead cells entering the vacuum cavity. In this experiment, a piece of air filter made of certain type of polymer installed in the vacuum channel.

Table 2. Average data of vacuum pressures of microdermabrasion machine applying air filter polymer in the vacuum channel (Three replications)

Observation (Weekly)	Vacuum pressures (cm Hg)	
	<i>Mild</i> < - 26	<i>Strong</i> > - 41
0	-26	-50
4	-25	-48
8	-22	-47
12	-21	-45

Moreover, the results of vacuum pressure using air filter polymer installed in the microdermabrasion machine are presented in Fig. 1 and Fig. 2. The reduction of vacuum pressures from starting point until at the end of observation, i.e. at the end of the 12th week is found to be 5 pressure unit (cm Hg), either for *mild* category or *strong* category applying air filter polymer (Table 2).

It was found that there is remarkable difference of vacuum pressure data yielding from microdermabrasion machine applying air filter installed in vacuum channel and the machine without air filter for both *mild* and *strong* category (Fig. 1 and Fig. 2). Fig. 1 shows the vacuum pressure data of *mild* category compared between applying air filter installed in vacuum channel and without air filter. Fig. 2 shows the vacuum

pressures of *strong* category compared between machine using air filter and air filter free. It seems that the reduction of vacuum pressures is consistent with lifetime of microdermabrasion machine both for *mild* and *strong* category using air filter or air filter free. The providing of air filter polymer in portable microdermabrasion machine shows better performance of the machine in terms of much more stable results of vacuum pressures obtained during 12 weeks of observation.

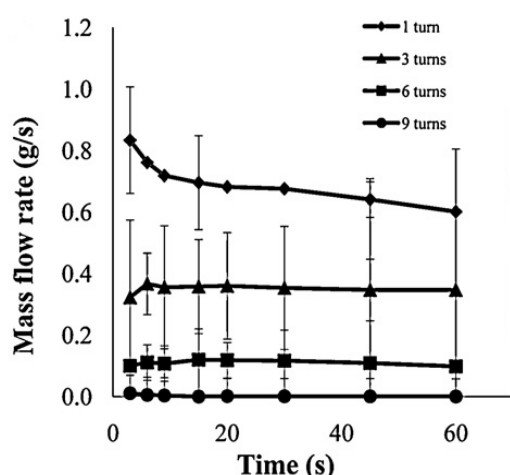


Fig 3. Crystal mass flow rate as a function of time at varied crystal knob turns. Suction pressure – 50 kPa. Alumina crystal (Samantha, N. et al, (2011)).

Unfortunately, very much little information has been available related with effect of parameters used in microdermabrasion machine in correlation with machine lifetime. However, Samantha, N. et al, (2011) ever reported the characteristics of dermabrasion machine in terms of suction pressure (vacuum pressure) and crystal flow rate. The *Athena Exfoliator* microdermabrasion machine used in this study does not apply any abrasive crystal for operation, so this is the added value of this

Athena Exfoliator machine

Furthermore, Samantha, N. et al, (2011) studied the relationship between crystal flow rate in terms of mass flow rate (g/s) and time of observation (second) at varied knob turns and suction pressures and

Further examination on Fig. 1 the vacuum pressure for *mild* category (< -26 cm Hg) at the end of observation (12th week) experienced reduction by 6 pressure unit (cm Hg) without using air filter in the machine. However, the reduction of vacuum pressure for *strong* category (> -41 cm Hg) at the end of observation (12th week) was more dramatic falling by 17 pressure unit (cm Hg) as presented in Fig. 2 that is almost three times larger than that shown by *mild* category (< -26 cm Hg) (Fig. 1).

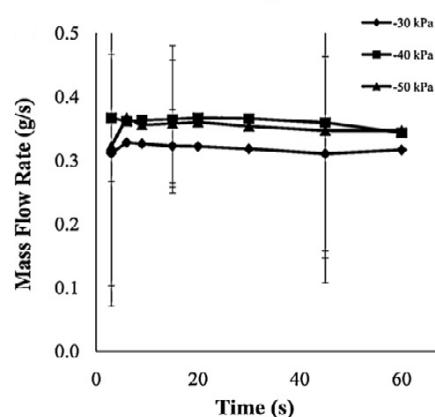


Fig 4. Crystal mass flow rate as a function of time at varied suction pressures. Three knob turns. Alumina crystal (Samantha, N. et al, (2011)).

the results shown in Fig. 3 and Fig. 4. The crystal mass flow rate expressed in relative unit ranging from 0 (highest flow rate) to 9 (lowest flow rate). The mass flow rate is directly measuring the mass moving through the machine. Moreover, zero knob turns is the maximum valve opening, whereas at nine turns the valve is almost closed. The time of observation is ranging for 3 – 60 s. As shown in Fig. 3 there is a consistency between number of knob turns and mass flow rate at observation time of interest, for example, mass flow rate at one knob turn is much higher than that of six knob turns. This is reasonable, since one knob turn at the position of almost maximum valve opening, whereas at six knob turns the valve opening getting much narrowed.

On the other hand, as shown by Fig. 4 the different suction pressures (-30 kPa, -40kPa, and -50 kPa) at observation time of interest showed less remarkable effect on mass flow rate at medium knob turns (three knob turns). It is apparent that degree of valve opening gives more effect on crystal mass flow rate rather than that of suction pressure effect based on detailed examination of Fig. 3 and Fig.4.

Although this work is still in the level of preliminary study, nevertheless the facts finding obtained from this study can be

Conclusion

The lifetime of microdermabrasion machine can be prolonged by applying air filter polymer installed in vacuum channel to resist any dead/damage skin cells from

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assumed as a valuable contribution for microdermabrasion machine performance using for human facial skin, which has never been discussed in any detail report previously. It should be noted that previous work as reported by Samantha, N. et al, (2011) was an investigation on porcine skin, while this study is in relation with human facial skin. As mentioned above, the *Athena Exfoliator* machine used in this study does not need any abrasive crystal, so less economic expense required for operating this machine.

human facial skin entering the vacuum cavity and therefore, a better performance obtained in this investigation.

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Original article

Dual Role Conflict and Withdrawal Behavior of Hospital Female Nurses in Semarang Regency

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Tri Ismu Pujiyanto¹, Achmad Syaifudin¹

¹Karya Husada Health and Science College of Semarang, Indonesia

Abstract

Background: Central Java is one of Indonesian provinces that are open to female nurses. There is an average of 70% female nurses per hospital in this province. Women who become wives and mothers as well as workers, often experience a conflict of dual roles, and this situation may impact their performance at work. **Objectives:** To find out relationship between dual roles conflict with withdrawal behavior of female nurses working at RSUD Ungaran Hospital in the Semarang Regency. **Research Methods:** This research was a quantitative, cross-sectional study. There were 78 female nurses approached for this study through purposive sampling. The study sample had 65 respondents. **Results:** 58.5% of female nurses at RSUD Ungaran Hospital did not experience dual role conflict. 66.2% of female nurses at RSUD Ungaran Hospital did not experience withdrawal behavior at work. **Conclusion:** There is a significant relationship between dual role conflicts with withdrawal behavior in female nurses. **Recommendation:** RSUD Ungaran Hospital should allocate training and provide facilities to reduce dual role conflict for female nurses.

Keywords: Dual role conflict; Female nurses, Withdrawal behavior

Corresponding author: Achmad Syaifudin¹; Email: achmad_syaifudin77@yahoo.com

Introduction

Nursing personnel comprise the majority staff in hospitals. The nursing profession is dominated by women (60-70% are female) (Gillies, 2003). There were approximately 223,257 nurses in Indonesia in 2017 who worked in hospitals. About 30,671 female nurses are employed in Central Java, one of the cities open to female nurses. On average, about 70% of nurses at hospitals in central Java (?) are female (Kemenkes RI, 2017).

Nurses must have high performance at work in order to provide quality health services for the community. Fulfilling the roles and responsibilities as a professional nurse is not easy, especially for female nurses with families. The female nurse with a family has a dual role as a breadwinner for the family, and as a housewife who is responsible for taking care of her family. This dual role often poses a conflict when the woman faces various obstacles in her household. The conflict may affect a female nurse's performance at work (Jimad & Habibullah, 2010). Although men can also experience multiple role conflicts, women may have a greater burden due to the expectation that they perform a majority of household duties as mothers and wives.

Professionally, nurses are required to work at a high level to thoroughly care for their patients. Problems due to family-job and family work conflicts may affect the work performance of the nurse. Role conflicts have two forms: family-job conflicts and family-work conflicts. Family-job conflicts occur due to an imbalance between work and family. When a person participates in a job, there may be difficulties fulfilling responsibilities for her family. The family-work conflict refers to a conflict where the general demands and time needed for family responsibilities create tension at work or interfere with the employment-related

responsibilities (Yabas & Babakus, 2008).

Performance problems due to dual role conflict may include arriving at work late, having unexcused work absences, performing work at a low level, and idleness. Nurse absenteeism is detrimental to a hospital because absent nurses are not caring for patients, but still earn their salary. Productivity decreases. Voluntary absences that are usually under the direct control of employees are a problem. This type of absence is different from involuntary, unintentional absence such as accidents or illnesses, which are usually outside an employee's control. Attendance problems at work may be one symptom of employee withdrawal behavior.

According to the interviews conducted at Ungaran Hospital in January 2019, the head nurse and female nurses on staff felt that the dual role conflict occurred when female nurses often arrived late for work. Reasons for coming late to work included responsibilities for the children, taking the child to school, and performing household duties such as cooking, washing, cleaning the house, and other responsibilities for the children and husband in the morning. In addition, female nurses asked for permission to go home during working hours to monitor children were still young or that were sick more often than male nurses. There were a higher percentage of female nurses woman that arrived late to work than male nurses.

Our study was conducted at the Ungaran Hospital in Central Java in 2019. In 2019, there were 129 female nurses (72.06%), while there were 50 male nurses (27.93%). When this study was conducted, the Ungaran Hospital had not implemented a fingerprint system for checking into work. Thus, nurses were not supervised tightly. The purpose of our study was to determine the relationship between dual roles conflict with withdrawal behavior of female nurses working at RSUD Ungaran Hospital in the Semarang Regency.

Research Methodology

This research was a quantitative, cross-sectional study that looked at the correlation between dual role conflict experienced by

female nurses and withdrawal behavior at work (Notoatmojo, 2012).

Study Population and Sample

There are 78 female nurses approached for this study in this study and sample of 65 that responded and agreed to the

questionnaires. The study used purposive sampling (Nursalam, 2014).

Data Collection

We collected data using two questionnaires. Questionnaire A consisted of 30 questions about dual role conflict. This questionnaire was developed from

Greenhaus & Beutell (1985). Questionnaire B consisted of 15 questions about withdrawal behavior (Ferdinand, 2006).

Data Analysis

Data analysis was conducted using SPSS software, version 17 (SPSS Inc., Chicago, 2008). We performed univariate analysis describing the frequency distribution and the variable percentage of dual role conflict and withdrawal behavior of female nurses

working at Ungaran hospital. Bivariate analysis using the Chi-Square test statistic was used to examine the relationship of dual role conflict with withdrawal behavior in female nurses (Machfoedz, 2013).

Ethical Approval

This study was approved by Ethical Research Committee of Karya Husada Health College & Science Semarang

Indonesia, Number 479/KH.KEPK/KH/IV/2019 in April 11th 2019.

Results

Table 1. Frequency distribution of dual role conflict among female nurses at RSUD Ungaran Hospital, Semarang Regency

Dual role conflict among female nurses	Frequency	Percentage
Experiencing Dual role conflict	27	41.5%
Not Experiencing Dual role conflict	38	58.5%
Total	65	100%

Based on table 1, most female nurses at Ungaran Hospital in the Semarang district did not experience a dual role conflict. Of 65 respondents, 38 respondents (58.5%) did not

experience dual role conflict. A minority (27 respondents or 41.5%) experienced dual role conflict.

Table 2. Frequency Distribution of withdrawal behavior among female nurses in RSUD Ungaran Hospital, Semarang Regency

Withdrawal Behavior	Frequency	Percentage
Experiencing withdrawal behavior	22	33.8%
Not experiencing withdrawal behavior	43	66.2%
Total	65	100%

Based on table 2, most female nurses at Ungaran Hospital did not experience withdrawal behavior. Of 65 respondents, 43 respondents (66.2%) did not experience withdrawal behavior. A small portion (22 respondents or 33.8%) experienced withdrawal behavior

Based on cross tabulation of dual role conflict and withdrawal behavior using the Chi-Square test, there was a correlation

between dual role conflict with the withdrawing behavior of female nurses in Ungaran Hospital Semarang district. Of 27 female nurses in Ungaran hospital who had dual role conflict, 18 respondents (66.7%) had withdrawal behavior. Of the 38 female nurses who did not experience dual role conflict, a majority (34 respondents or 89.5%) did not have withdrawal behavior.

Conclusions and Discussion

The results showed that about 41.5% of female nurses in the Ungaran Hospital of Semarang District experienced dual role conflict. However, for nurses experiencing the dual role conflict, the situation is very stressful. This conflict may occur because the female nurse is overloaded professionally and with family responsibilities. She may have to work overtime, and her workplace may be far from home. Due to commuting a long distance, a nurse may be very tired before starting work. In addition, the nurse may experience a workload that is too high at home. Sometime there is no cooperation or help with household duties from her husband or the other family members, causing the nurse of undergo conflict.

The results showed that the majority of female nurses (43 respondents; 66.2%) working at Ungaran Hospital did not experience withdrawal behavior. However, 23 respondents (33.8%) experienced withdrawal behavior. According to the answers from the respondents' questionnaires, the most frequent answers from respondents about why she felt that she could not focus work was because she was thinking about her child

at home (as much as 65%), could rarely socialize with colleagues in the office (as much as 64%) and often could not get permission to not come to work if there is a family problem (as much as 63%).

Withdrawal behavior at work occurs when an employee physically and psychologically separates and disengages from their work and work organization (Mahdi K, 2012). The physical forms of withdrawal behavior at work include absenteeism, delayed arrival to work, and turnover. There are also psychological forms of withdrawal behavior including: obedience in the form of passive compliance, making a minimum or least possible effort on the job, and a lack of creativity in solving problems at work (Pinder, C. C. 2008).

Our findings that there is a connection between experiencing dual role conflict and withdrawal behavior at work may have implications in a nurse's overall job performance. Excessive lateness can be evidence that a nurse employee wants to be detached from her company, the hospital. This is especially true if an employee is consistently late because it shows a lack of

motivation to go to work on time (Lohana, 2012). Multiple role conflicts between work and family may reduce a nurse's motivation to come work in a timely manner. Nurses may feel tired of doing the work at home and of the responsibilities of parenting. She may think that it is better to be at home with her

children. She may feel a lack of motivation at work because of her situation at home and other responsibilities outside of her job. The stress from this situation may triggers the nurse to come to work late. She may also consider resigning from her job as a nurse (Mahdi K, 2012).

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Original article

Knowledge, Attitude and Practice concerning Breast Cancer among Women Attending Khartoum Breast Care Centre, Sudan

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Mohamed Osman Elamin¹, Hatim Rahamtalla²,
Fadhel Ali Mohammed²

¹Faculty of Public Health & Informatics, Umm-Al-Qura University, KSA ²University of Bahri, Sudan

Abstract

Breast cancer is an abnormal growth of cells, which tend to proliferate in an uncountable way. It develops from breast tissue and impacts 2.1 million women each year, and causes the greatest number of cancer-related deaths among women. A cross-sectional descriptive institutional based study was conducted with the aim to assess knowledge, attitude and practice among women with breast cancer or at risk, aged range between 15-65 years attending Khartoum Breast Care Centre. A total of 384 participants were selected by systematic random sampling techniques and data was collected by a questionnaire and analyzed by using (SPSS). Chi-square test was employed to test the association between different variables. The study showed that 55.5% and 80% of the participants had good knowledge concerning signs and symptoms and the risk factors of the breast cancer respectively. 42.2% of the participants accept the infection with breast cancer. 35.9% and 49.2% of the participants make clinical and breast cancer self-examination respectively. There is significant association between knowledge and breast cancer self examination at $p < .000$. There is significant association between attitudes of the respondents towards the infection with breast cancer and practicing breast cancer self examination at $p < .024$. Although, the participants have good knowledge (80%), concerning the risk factors of breast cancer and favorable attitudes (80.2%), towards the infected person, there is poor practice (35.9%), concerning clinical breast cancer test.

Keywords: Breast cancer, Knowledge, attitude and practice, Khartoum Breast Care Centre

Corresponding author: Mohamed Mohamed Osman Elamin, E-mail: mohsm71@yahoo.com

Introduction

Breast cancer is a type of cancer that starts in the breast. Breast cancer cells usually form a tumor that can often be seen on an x-ray or felt as a lump. It arises when abnormal cellular growth occurs in certain structures and types of cells within the breast. Breast cancers usually begin in the ducts, some start in the glands and others are less common as ductal carcinoma in situ (DCIS) and invasive carcinoma, phyllodes tumors and angiosarcoma, (ACS, 2019). Signs of breast cancer may include a lump in the breast, a change in breast shape, dimpling of the skin, and fluid coming from the nipple, a newly-inverted nipple, or a red or scaly patch of skin. Risk factors for developing breast cancer include being female, obesity, a lack of physical exercise, alcoholism, hormone replacement therapy during menopause, ionizing radiation, an early age at first menstruation, having children late in life or not at all, older age, having a prior history of breast cancer, and a family history of breast cancer, (Kyu HH, 2016).

Poor practices concerning the risk factors of the disease can be controlled by simple measurement as health education intervention. Study knowledge, attitudes and practices can help in selecting appropriate health education methods and help policy makers to fight cancer and opens the door for researchers to use result for further studies in the area. WHO, estimated that 627,000 women died from breast cancer in 2018. While breast cancer rates are higher among women in more developed regions, rates are increasing in nearly every region globally (WHO a., 2018). The prevalence of breast cancer in Sudan was 3.9 cases per 100,000 female populations, (Marwa, 2016)⁴. The incidence rates vary widely across the world, from 27 per 100,000 in Middle Africa and Eastern Asia to 92 per 100,000 in Northern America, (Yungshook Han, 2019). The survival rates have improved because access to medical care is improving in many nations and the majority of breast cancer cases are diagnosed at an earlier and localized stage. In addition,

improved surgery and tailored adjuvant treatment regimens are available, (WHO b, 2018).

The diagnosis of breast cancer is based on clinical examination in combination with imaging, and confirmed by pathological assessment. Clinical examination includes bimanual palpation of the breasts and loco-regional lymph nodes and assessment for distant metastases (bones, liver and lungs; a neurological examination is only required when symptoms are present). Imaging includes bilateral mammography and ultrasound of the breast and regional lymph nodes. Pathological diagnosis should be made according to the World Health Organization classification and the tumor–node–metastases (TNM) staging system, (Dhiya Abu Idris, 2018), prevention includes; avoiding radiation exposure, by screening tests and self-examinations, manipulation of the hormonal milieu and use of tamoxifen, low-fat diets, and/or the consumption of flaxseed. Early detection is very important to avoid new cases of disease, also work to raise the awareness of all women about the risk disease and method to avoid the breast cancer in future, (CDC, 2019). Treatment should be provided by a multidisciplinary team, which includes: at least one surgeon, radiation oncologist, medical oncologist, radiologist and pathologist, who are specialized in breast cancer. A breast nurse, or a similarly trained and specialized health care practitioner, acting as a patient navigator, is also important. Other members of the breast team may include plastic/reconstructive surgeons, psychologists, physiotherapists and geneticists. Following a diagnosis of breast cancer, a patient finds herself in an unfamiliar landscape. This creates different levels of stress and needs to be addressed individually and tailored to each patient's needs. They will need space and time to process and comprehend their diagnosis, so they can cope psychologically with the diagnosis and treatment plan. To accommodate for this, information on

diagnosis and treatment choice should be given repeatedly (both verbally and in writing) in a comprehensive and easily understandable form. The use of reliable, patient-centered websites or similar sources of information is important and very useful, (Ziegler, 2017).

A Pakistani study on female towards breast cancer was conducted by Sara in 2019. The study revealed that over 50% participants had knowledge about breast cancer symptoms. Majority (> 90%) had positive attitude and intended to see a doctor immediately if they ever felt a breast lump, but had poor (28.3%) practices regarding breast self-examination (Sara, 2019). A study, which was conducted in Nigeria about the practice of the respondents towards breast cancer clinical test and breast cancer self test respectively. The study revealed that about 60% of women don't make breast cancer clinical test and breast cancer self test respectively, (Michael N Okobia, 2020). A

study that conducted in Ethiopia by Sarah Rayne, in 2019 revealed that the majority (67.4%) of the women were found to have negative attitudes towards breast cancer (Sarah Rayne, 2018).

Breast cancer is one of the most frequently detected cancers and is the major cause of death among women worldwide. Awareness of women's breast cancer encourages them to become familiar with what is normal or abnormal through looking at and feeling their breasts. The target population has poor knowledge and malpractices concerning breast cancer. The main objectives of this study are 1) to describe knowledge, attitude and practice among women concerning breast cancer in Khartoum Breast Care Centre and 2) to determine the relationship between sociodemographic factors, knowledge, attitude and practice of breast cancer in Khartoum breast cancer center.

Research Methodology

Study Design

This is a descriptive cross-sectional institutional based study. Khartoum Breast Care Centre (KBCC) is a non-profit, privately funded organization opened in October 2010. It is the only specialized and multidisciplinary Breast Cancer Centre in Sudan. It has advanced diagnostic and

surgical equipment utilized by highly dedicated and qualified physicians and support staff and has managed to establish an elite standard for specialized medical services in Sudan. KBCC not only covers Sudan, but also neighboring countries (Chad, South Sudan, Eritrea and Ethiopia).

Study population

The target population of the study were women with breast cancer or at risk, aged range between 15-65 years, who attends Khartoum Breast Care Centre. The majority

come to the centre from many neighbouring areas as some come from other states and neighbouring countries.

Sample size

The sample size was calculated by using the following formula: $n = (z^2 pq (df))/d^2$. Where: n is the sample size to be computed, z is the standard normal deviation at 95% confidence level (set at 1.96), p is the

proportion in the target population estimated to have proportion of breast cancer in target population ($p=50\%$ if unknown), d is the degree of accuracy /accepted margin (set at 0.05), $n = (3.8416 * .5 * .5) / 0.0025 = 384$.

Sample determination

All daily women with breast cancer or at risk, age between 15-65 years,

attending the centre were chosen till the total determined sample size was selected

Data collection

Data was collected from the participants for three months by using questionnaire. The questionnaire includes 29 questions concerning the socio-demographic information, basic information, and questions concerning KAP of the participants. The participants award excellent if he checks all the choices, good

knowledge if he checks more than half of the choices, poor if he checks less than half and don't know if choose I don't know. For the attitudes there is three choices either, favourable/accepted agree or unfavourable/unacceptable/ disagree or I don't

Data Analysis

The collected data from field was coded and entered into the computer and analyzed by using (SPSS) 23.0 versions, showing the frequent and the percentage. χ^2

tests was used to show the association between different variables. The results were presented in text, figures and tables.

Results

The study showed that 45.5% of the participants were university graduated and 10.4% were post graduated. 34.4% of the respondents' monthly incomes ranged between 1500-<3000, 27.1%, between 3000-<4500 and 38.5% were above 4500 SDGs. Only 19.8% of the participants use contraceptive pills, nearly half 49.2% of the

participants practice breast feeding and 58.3% of the participants take balance diet. More than one-third 37.3% of the participants' reasons that inhabited them from going to the centre were preoccupation, 31.3% were lack of money, 25.8% were the far of the clinic while 5.65 were of lack of time.

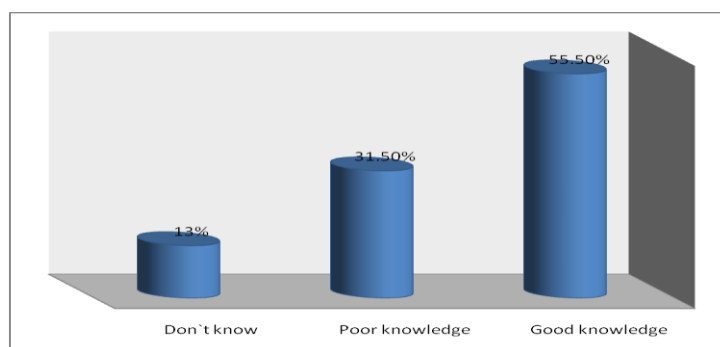


Fig.1 Knowledge of the participants concerning signs and symptoms of breast cancer

The study showed the following results (n=384). More than half 55.5% of the participants had good knowledge concerning the signs and symptoms of breast cancer, while 31.50% had poor knowledge (Fig 1).

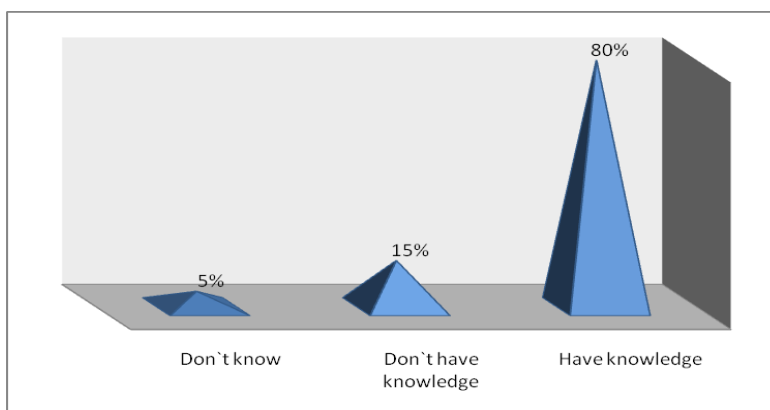


Fig.2 Knowledge of the participants concerning the risk factors of breast cancer

The majority 80% of the participants have knowledge about the risk factors of the breast cancer, while 15% don't have (Fig. 2)

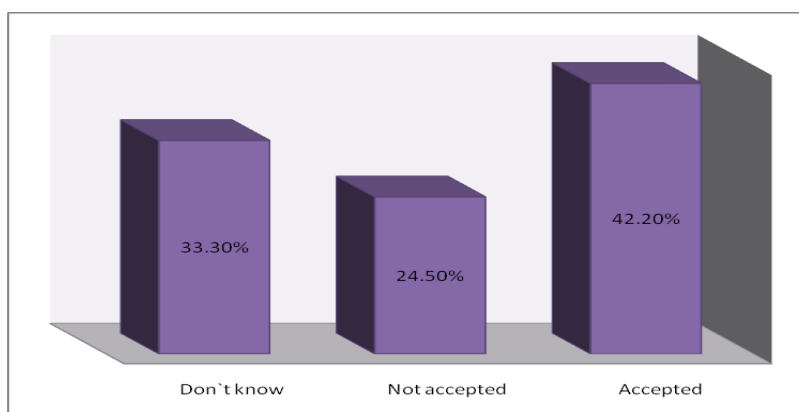


Fig.3 Attitudes of the participants towards the infection with breast cancer

Most 42.20% of the participants accept the infection with breast cancer while 24.5% don't accept the infection. (Fig. 3)

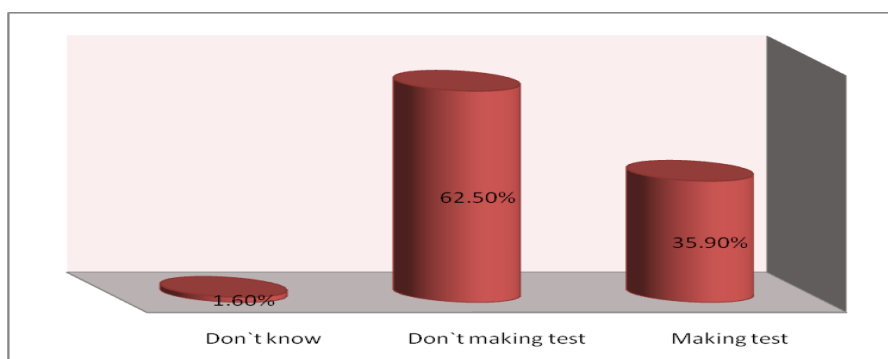


Fig. 4 Practice clinical breast cancer test

More than one-third 35.9% of the participants make clinical breast cancer test and 62.50% do not making clinical breast cancer test. (Fig. 4)

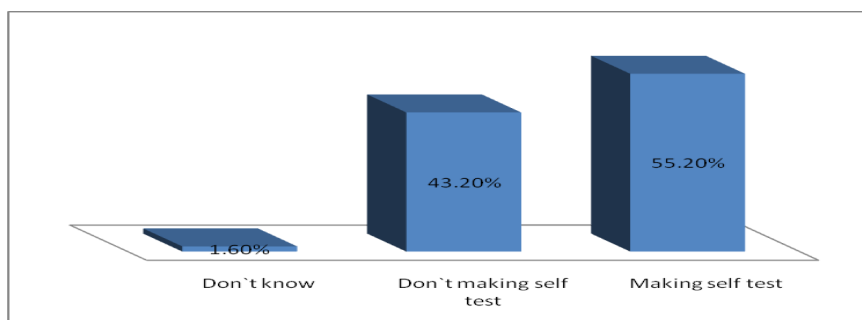


Fig. 5 Practice breast cancer self-test

More than half 55.2% of the participants make breast cancer self-test and 43.2% don't make breast cancer self-test (Fig. 5).

Table 1 Association between level of education and making breast cancer clinical examination (n= 384)

Level of education	Making self breast cancer test			Total
	Yes	No	Don't know	
Illiterate	22	13	1	36
Primary	18	21	0	39
Secondary	32	57	5	94
Graduate	50	124	0	174
Post graduate	15	25	0	40
Total	138	240	6	384

There is a significant association between level of education and making breast cancer clinical examination at $\chi^2 = 31.35$, $df = 10$, $p = .001$. (Table 1).

Table 2 Association between level of education and making breast cancer self-examination (n= 384)

Level of education	Making self- test in the house			Total
	Yes	No	Don't know	
Illiterate	13	22	1	36
Primary	14	24	1	39
Secondary	54	36	4	94
Graduate	103	71	0	174
Post graduate	28	12	0	40
Total	212	166	6	384

There is a significant association between level of education and making breast cancer self-examination at $\chi^2 = 24.87$, $df = 10$, $p = .006$. (Table 2).

Table 3 Association between Knowledge and breast cancer self-examination (n= 384)

Knowledge	Breast cancer self-test			Total
	Doing breast cancer self-test	Don't doing breast cancer self-test	Don't know	
Have knowledge	139	68	6	213
Don't have knowledge	51	70	0	121
Don't know	22	28	0	50
Total	212	166	6	384

There is significant association between knowledge and breast cancer self-examination at $\chi^2 = 27.757$, $df = 4$, $p = < .001$. (Table 3).

Table 4 Association between Knowledge and attitudes of the participants towards the infection with breast cancer (n= 384)

Knowledge	Attitudes of the respondents towards the infected person with breast cancer			Total
	Favorable	Unfavorable	Don't know	
Have knowledge	117	35	61	213
Don't have knowledge	28	46	47	121
Don't know	17	13	20	50
Total	162	94	128	384

There is significant association between knowledge and attitudes of the participants towards the infection with breast cancer at $\chi^2 = 37.315$, $df = 4$, $p = < .001$. (Table 4).

Table 5 Association between attitudes of the participants towards the infection with breast cancer and self-breast cancer examination(n= 384)

Attitudes of the respondents	Breast cancer Self-test			Total
	Doing breast cancer self-test	Don't doing breast cancer self-test	Don't know	
Favorable	102	58	2	162
Unfavorable	44	50	0	94
Don't know	66	58	4	128
Total	212	166	6	384

There is significant association between attitudes of the participants towards the infection with breast cancer and practicing breast cancer self examination at $\chi^2 = 11.208$, $df = 4$, $p = .024$. (Table 5).

Discussion

In this study 55.5% and 80% of the respondents had good knowledge concerning signs and symptoms and the risk of the breast cancer respectively. The good knowledge is due to the educational level, as 55.9 % of the respondents were either graduated or post graduated. This good knowledge increases the chances of applying preventive measurements of the disease. This agrees with the study, that conducted by Sara et al., which revealed that over 50% participants had knowledge about breast cancer symptoms(Sara, 2019). But disagreed with the study about relationships between KAP and breast cancer that conducted in Nigeria, which showed that the respondents had poor knowledge of breast cancer(Michael N Okobia, 2020).

The study revealed that 40.9%, of the participants` family members had favorable attitudes towards the infection with breast cancer. As mentioned before, the reasonable level of education contributes in promoting the family members` attitudes towards breast cancer. This result disagrees with study that conducted in Ethiopia in 2019 which showed that the majority (67.4%) of the women were found to have

negative attitudes towards breast cancer (Sarah Rayne, et al, 2018).

The study revealed that 62.5% and 42.2% of the participants don`t make breast cancer clinical examination and breast cancer self test respectively, although they have good knowledge (80%), concerning the risk factors of breast cancer. Concerning breast cancer clinical test, this is because they cannot afford the cost of the services as 61.5% of participants had limited monthly income ranged between 1500-<4500 SDGs. This result agreed with the study which was conducted in Nigeria about the respondents, who don`t make breast cancer clinical test and breast cancer self test respectively. The study revealed that about 60% of women don`t make breast cancer clinical test and breast cancer self test respectively, (Michael N Okobia, 2020). Although, the participants have good knowledge (80%), concerning the risk factors of breast cancer and favorable attitudes (80.2%), towards the infected person, there is poor practice (35.9%), concerning clinical breast cancer test. The study recommends that State Ministry of Health should conduct health education program focusing on breast cancer clinical and self examinations.

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Author Guideline and Instruction

International Journal of Public Health and Health Sciences (IJPHS)

Instruction for Authors & Guidelines (Revised March 18, 2019)

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Thesis/dissertation

Hom, K. E. (2018). *Association of Air Pollution with Longitudinal Changes in Arterial Stiffness and Correlated of*

Longitudinal Changes in Arterial Stiffness in the Multi-Ethnic Study of Atherosclerosis (MESA). A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctoral of Philosophy, University of Washington.

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