

**AWARENESS AND KNOWLEDGE  
OF BREATHING EXERCISE AS  
COVID-19 MANAGEMENT  
AMONG UTAR STUDENTS**

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**AWARENESS AND KNOWLEDGE OF BREATHING  
EXERCISE AS COVID-19 MANAGEMENT AMONG UTAR  
STUDENTS**

By

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A Research project submitted to the Department of Physiotherapy,  
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# PREVALENCE OF LOW BACK PAIN AND ITS ASSOCIATION WITH ERGONOMICS USAGE AMONG UTAR STUDENTS

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## ABSTRACT

**Background and Objective:** COVID-19 is one of the most common disease people faced nowadays. COVID-19 can bring negative effects on our body system especially respiratory system. However, breathing exercise is a very effective method to manage COVID-19 symptoms and benefits in our breathing. Nowadays, University Tunku Abdul Rahman (UTAR) is already conducting the physical classes for their teaching method. Students are required to back to the campus and this will lead to physical contact among each other among the students. Eventually the risk of getting COVID-19 may increase among them. However, if they have the awareness and knowledge of breathing exercise to manage COVID-19 symptom, they can recover faster from COVID-19 positive and prevent complication from the disease. Hence, the aim of this study is to determine the awareness and knowledge of breathing exercise as COVID-19 management among UTAR students.

**Methods:** The sampling method used in the study was convenience sampling and the sample size was calculated to be at 415 students. The study is conducted by sending online questionnaire to the participants.

**Results:** The total number of respondents was 415 students, 2 data were removed due to fullfill the exclusion criteria. There are 255 male participants (61.7%) and 158 female participants (51.2%). For the awareness level, 79 participants (19.1%) is good, 141 (34.1) is moderate, 181 (43.8%) is poor and 12 (3.0%) is no awareness. The mean score is 1.69 with SD = 0.809. For the knowledge level, 62 participants (15.0%) is good, 101 (24.5%) is moderate, 193 (46.7%) is poor and 57 (13.8%) of participants have no knowledge of breathing exercise. The mean is 1.41 with SD = 0.905

**Conclusion:** In conclusion, most of the participants are in the category of poor awareness and poor knowledge of breathing exercise as COVID-19

management. Breathing exercise is effective in managing the symptom of COVID-19 and should be apply on everyone. Through this research, it can improve the awareness and knowledge among the people who do not know breathing exercise. Future studies in this area are highly recommended.

**Keywords:** COVID-19, Breathing exercise

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## APPROVAL SHEET

This Research project entitled “**AWARENESS AND KNOWLEDGE OF BREATHING EXERCISE AS COVID-19 MANAGEMENT AMONG UTAR STUDENTS**” was prepared by LOH WAI KIT and submitted as partial fulfilment of the requirements for the degree of Bachelor of Physiotherapy (HONOURS) at Universiti Tunku Abdul Rahman.

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**PERMISSION SHEET**

It is hereby certified that **LOH WAI KIT** (ID No: **19UMB03616**) has completed this Research project entitled “**AWARENESS AND KNOWLEDGE OF BREATHING EXERCISE AS COVID-19 MANAGEMENT AMONG UTAR STUDENTS**” under the supervision of Ms Meneka Naidu a/p Mohnaraju (Supervisor) from the Department of Physiotherapy, Faculty of Medicine and Health sciences.

Yours truly,

(LOH WAI KIT)

## DECLARATION

I hereby declare that the Research project is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

Name: LOH WAI KIT

Date: 23/12/2022



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#### **List of abbreviation**

UTAR	University Tunku Abdul Rahman
COVID-19	Coronavirus disease
N	Frequency
M	Mean
SD	Standard deviation

# CHAPTER 1

## INTRODUCTION

### 1.1 Chapter overview

This chapter will outline the background of the study, providing context for the overall research project before proceeding to the importance and relevance, research objectives as well as hypotheses and operational definition of terms for the research study.

### 1.2 Background of study

#### 1.2.1 COVID-19

According to World Health Organization (WHO, n.d.), covid-19 or coronavirus disease is an infectious disease caused by the SARS-CoV-2 virus. SARS-Cov-2, previously known as coronavirus, is the causative virus for this disease and it originates from Wuhan, China with its first reported case of human infection back in December 2019. From there, it quickly resulted in an outbreak which was first unsuccessfully contained by the China government and has now spread across the globe causing more than 241 million positive cases and 4.92 million deaths (Worldometer, n.d.). COVID-19 is a respiratory disease where the main complications are aimed towards the respiratory system, but it can also

cause systemic effects with symptoms extending to affect other systems of the body. Some common symptoms included are fever, chills, cough, fatigue, loss of appetite, muscle aches and many more (Centre of Disease Control and Prevention, 2021).

### **1.2.2 Complications of COVID-19**

COVID-19 is a respiratory disease that result complications on our body systems. Firstly, it bring major impact on the respiratory system. The virus of COVID-19 or also known as SARS-CoV-2 are able to get in to human body system through some media, such as air, liquid, close contact and many more. The virus enter through nose, mouth and fluid in eyes. Then it can reach the respiratory tract and eventually reach the alveoli and lungs. This SARS-CoV-2 virus can lead to infection and inflammation of the respiratory system such as upper or lower respiratory tract, alveoli and lungs (WHO, n.d.).

At first the infected individual will experience mild or moderate symptoms such as regular cough, sore throat, phlegm production, fever and dyspnea. Other symptom such as anxiety, fatigue, chest pain and sleep disturbance also the possible complication of the COVID-19. Sometimes pneumonia is discover among the individual with mild and moderate symptom. This can cause the process of oxygen and carbon dioxide exchange become non effective due to the infection of respiratory system such as alveoli and lungs. For the severe symptom, the virus spread and infection affects the both lungs. The lungs may fill with fluid and debris as the swelling gets worse. Pneumonia or other damage of lungs may occur. Eventually, the air sac fill with mucus, fluid, and other cells that are trying



to fight the infection. Oxygen transportation and exchange will alter due to damage of cells. (Pathak, 2021)

COVID-19 may cause in decreasing in lung compliance and respiratory capacity. Expansion of lungs will become poor and there is decreasing in lung volume. As a result, it will cause respiratory illness, whereby the individual cannot get enough oxygen due to the infection of lungs. The individual who experience covid-19 will experience shortness of breath, fever and frequent coughing. If there is no management for the covid-19, it may be dangerous to the covid-19 patient and eventually may cause death (WHO, (n.d.)).

### **1.2.3 COVID-19 management**

There are several management for COVID-19. One of the effective management is breathing exercise. Breathing exercises can be given during, pre and post COVID-19 to help the patient in the recovery phases. In this covid-19 pandemic period, breathing exercises are widely given to the covid-19 patient by the healthcare provider as the post covid-19 recovery activity. According to Lien (2021), breathing exercise is an exercise which involve inspiration and expiration of the air, which is also breath in and out of air. There are some breathing exercises those are helpful in the management for post covid-19 recovery period, for example diaphragmatic breathing, thoracic expansion exercise, pursed lip breathing, square breathing and so on. Through breathing exercise, it can help the individual to increase lung volume, increase lung compliance, decrease work of breathing and improve the breathing quality. The respiratory muscle will be trained such as diaphragm and intercostal muscle, thus

they can help in the respiration more efficient, whereby the patient will have enough oxygen intake. Besides, breathing exercise can also help in the psychological field by calming down the emotions of the patients who experience covid-19. Anxiety can be reduced (Grag, 2022). Furthermore, according to London North University Healthcare (2020), breathing exercises need to be included in the post covid-19 recovery phase. There are some breathing exercise can be used such as active cycle of breathing. Covid-19 bring some complications such as pneumonia and cause inflammation, the formation of fluid and debris that will decrease the breathing ability of the patient. The oxygen intake will also decrease and not enough for the demand. Thus, some breathing exercise for increase lung volume and clear secretion can be done (Galiatsatos, 2022).

#### **1.2.4 Breathing exercise**

Breathing exercise is an exercise that utilize change in the breathing pattern to improve the physical, mental and spiritual well being (Mana Breathwork, n.d.). Breathing exercise involve inspiration which is breath in of air and expiration, which is breath out of air. The main importance of breathing exercise is to improve our breathing quality and ensure the adequate of oxygen intake. Breathing exercise can be used in many occasion in daily life such as sports, anxiety management and many more. In current, breathing exercise is also frequently used as a management during pre and post rehabilitation for COVID-19 (Wang et al, 2020).

### **1.2.5 Concluding Remarks**

Therefore, this research study is conducted to determine the awareness and knowledge of breathing exercise as COVID-19 management among UTAR students. Form the results, we are able to obtain an general idea and this will help in the future study regarding this topic.

### **1.3 Research objective**

1. To determine the awareness of breathing exercise as COVID-19 management among UTAR students
2. To determine the knowledge of breathing exercise as COVID-19 management among UTAR students

### **1.4 Research question**

- Are UTAR students aware of breathing exercise as COVID-19 management?
- What is the level of knowledge towards breathing exercise as COVID-19 management among UTAR students?

## **1.5 Rationale**

Currently, University Tunku Abdul Rahman (UTAR) is already conducting the physical classes for their teaching method. Students are required to back to the campus and this may increase the risk of getting covid-19 positive. For the students who tested covid-19 positive, they need to attend the hybrid classes and do their self management during quarantine. Through this study, it can improve the awareness and knowledge among UTAR students in Sungai Long area. It also can encourage the participants to do breathing exercise in this covid-19 pandemic, as a result it can improve their breathing quality and provide an idea for their covid-19 recovery phase. The post covid-19 complication such as breathing problems can also be reduced among the students. This can help them back to the physical study as soon as possible and increase the level of health among UTAR students. Besides, the data of the study can used as reference for the health care provider to know the public awareness, thus they are easier to plan the treatment menu and patient education when face patient who experience covid-19. There are also not much study regarding this topic in Malaysia.

## **1.6 Scope of study**

The aim of the study is to find out the awareness and knowledge of breathing exercise as covid-19 management among UTAR students in Sungai Long and

Kampar area. The participants involved are all the UTAR students in both Sungai Long and Kampar area and experienced the covid-19 pandemic period.

### **1.7 Structure of research project**

In this research paper, there are 5 chapter in total. Chapter 1 will cover the background of the study which include the research questions, research objectives, rationale, importance, and relevance of the study. Chapter 2 follows subsequently with the literature review done on relevant themes of past studies. Chapter 3 features the methodology used in this research which discusses the research design, sampling design, research instrument and procedure for data collection. Chapter 4 will present the results of the data collected after descriptive and inferential analysis. The mean and standard deviation would be find out to give a clear image of the results. Finally, Chapter 5 will conclude with the discussion of the findings from the study, the limitation of the study and suggestion for future study.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Chapter overview**

This chapter outlines the different themes explored through past journal and literature which provides the framework for the research project. The literature review explained the past studies and provide a clearer image and idea regarding the research topics.

#### **2.2 Awareness and Knowledge of breathing exercise**

According to Dighal, et al (2015), a study regarding awareness about indication of breathing exercises among physiotherapists in India - A multicenter survey had done. The aim of the study is to determine the awareness of the breathing exercises among the physiotherapist in India. The result showed the knowledge and awareness of breathing exercises among the physiotherapist is 60% (Dighal, et al, 2015). More education programme regarding this topic are needed for the participants according to the researcher.

Furthermore, according to Barathi & Kumar (2019), a study from India regarding Assess the Knowledge Regarding Breathing Exercise Among Children

with Asthma at Saveetha Medical College and Hospital had done. The results showed that among 60 samples, 10 (16.6%) had adequate knowledge and 16 (26.7%) had moderate knowledge and 34 (56.7%) had inadequate knowledge. More than half of the participants are lack of awareness and knowledge. The participants with adequate awareness and knowledge are not more than 20%. One of the reason of this result is due to the age of the participants. Most of the participants are below 15 years old and they had less exposure to the knowledge of breathing exercise.

Besides, there is a research of assessment of knowledge regarding asthma and breathing exercise among bronchial asthma patient had done by Kumar, et al (2018). It is a cross sectional study conducting by sending questionnaire survey to the participants and analyse the data after the participants had responded the questionnaire. The target population are the student from SMS medical college, India. Based on the result, it shows that the percentage of participant with adequate awareness and knowledge is around 36% and it indicated the awareness and knowledge among the asthma patients are quite low.

Form the literature review, there are different outcome obtained from the different group of participants. Some of the participants for example physiotherapy and nursing students showed they have adequate awareness and knowledge regarding the breathing exercises, however, majority of the participants such as, children, students and others showed they are lack of awareness and knowledge regarding this topics. Besides, the study are done by

the foreign researcher and different group of population. Hence, a research needed to be done in Malaysia to find out the awareness and knowledge of breathing exercise.

### **2.3 Breathing exercise for COVID-19**

Breathing exercise is an exercise involve breath in and out the air. Breathing exercises are widely use in covid-19 rehabilitation and recovery stages. A research about ‘the effect of deep breathing exercise with Triflo on dyspnoea, anxiety and quality of life in patients receiving covid-19 treatment: A randomized controlled trial’ from Cengiz, et al (2021) had done. From the study, the result showed that the covid-19 patient who active involve in breathing exercise has shorter hospitalization period. They can recover faster than those who are not involve in breathing exercise. Moreover, the individual with breathing exercises have higher SPO2 level and better breathing quality (Cengiz, et al, 2021).

Further more, there is a study from Indonesia researcher about ‘Amygdala Changes Through Breathing Exercise in coping with the Covid-19 Pandemic’. Breathing exercises is effective in the psychological aspect of the covid-19 patient. The anxiety can be reduce among the patient through appropriate breathing exercises (Yuliana, 2021). According to Wang, et al (2020), breathing exercise can improve symptoms of dyspnea, relieve anxiety, improve lung compliance, decrease work of breathing and increase oxygen intake. There are many types of breathing exercises can be used based on the situation of the patient such as deep breathing, diaphragmatic breathing and pursed lip breathing.



In addition, patient education is also important in the rehabilitation period. The with the adequate knowledge, patient will involve in the breathing exercises and rehabilitation programme more actively. Hence awareness and knowledge need to be raised among the patients.

Furthermore, there are example of a study conducted in China using qigong and yoga as a management for COVID-19 rehabilitation. Based on the study, the exercise had improve the breathing pattern among the patients. Qigong and yoga is a breathing exercise that content combination of other breathing exercise suach as deep breathing and abdominal breathing. It had brought some benefits such as strengthening respiratory muscle, increase lung volume, relief stress, enhance immune function and many more. The management if often used at the elderly patients as some of them are not suitable in vigorous breathing exercise (Feng, 2020).

Moreover, according to Hamzelou (2020), it had also proven that breathing exercise is able to help in COVID-19 management. Deep breath followed by a forced cough is a very effective way to clear mucus and secretion in the airway and lungs. If coughing is not encourage, patient can do huffing exercise instead to help in secretion clearance. The breathing exercise can also help in reduce fatigue and anxiety management. Exercises such deep breathing and pursed lip breathing

From the examples above, it showed evidence and clearly proof that breathing exercises is very helpful for the covid-19 management especially during post covid-19 recovery period. Therefore, the research regarding the awareness and knowledge of breathing exercises need to be done to instill the importance of breathing exercises in the mind of the community.

## **CHAPTER 3**

### **METHODS**

#### **3.1 Chapter overview**

This chapter will explain the research methodology used, highlighting the research design, sampling design, research instrument and procedure in detail.

#### **3.2 Research design**

The research design for this study was analytical, observational and cross-sectional study. The research is observing the results of the knowledge and awareness of breathing exercise for the management of covid-19 and involve analytical thinking. There is no comparison group in this study. The data is collected through online questionnaire survey. The questionnaire of the study were sent to the participants through social media platforms such as Email, Whatsapp, Facebook, Instagram and Microsoft Teams in the form of Google Doc. The targeted participants are all the UTAR students including Sungai Long and Kampar area that were still active in their academics at time of recruitment. The sampling method was convenience sampling.

### **3.3 Ethical approval**

This study was performed after obtaining the ethical approval from the Scientific and Ethical Review Committees (SERC) of UTAR )

### **3.4 Sampling Design**

The participants of focus are the UTAR students in Sungai Long and Kampar area that were still active in their academics at the time of participation. Sample size was based on the 21000 number of UTAR students quoted by the Division of Admissions and Credit Evaluation of UTAR. Next, the Krejcie & Morgan (1970) table are used to determined the sample size for the study. The sample needed for the study is to be 377 people with an additional 38 people to account for the 10% dropout rate resulting in the final sample size to be 415. The sampling method used was convenience sampling.

### **3.5 Inclusion criteria:**

- UTAR students
- Age above 18
- Able to understand English

### **3.6 Exclusion criteria:**

- Non UTAR students
- Age below 18
- Not able to understand English
- Had seek advise from health care worker before regarding breathing exercise

### **3.7 Research instrument**

The survey distributed was divided into 5 main sections which are inform consent, personal data protection statement, demographic of data, then followed by self-modified questionnaire of awareness of breathing exercise and knowledge of breathing exercise as COVID-19 management. The first section Informed consent section containing a brief introductory description regarding the background as well as the purpose of the study. The researcher's contact information was also left in the first section of the survey in case the participants require clarification regarding the survey.

The second section followed by the personal data protection statement. The participants are informed that their personal data will be protected and in a safe condition. Also the researcher will not used their personal data to conduct any illegal activities. The third part is followed by the demographic data, which

collected participants' information such as name, signature, age, gender, campus and faculty.

The next part is the questionnaire about awareness of breathing exercise. It was self modified questionnaire based on the examples of previous study. It start with the survey whether participants heard breathing exercise before and what types of breathing exercise they know. Next the survey continue with whether participants had perform any breathing exercise and had been taught to perform breathing exercise or not. Furthermore, questions about the effects of COVID-19 and benefits of breathing exercises to manage COVID-19 are asked to test the awareness. The average awareness of all questions are calculated. If the percentage of correct answer is 60% and above, it is consider participants have good awareness. If the percentage of correct answer is between 30% to 60%, it consider moderate awareness. If the percentage is between 30% to 10%, it consider poor awareness. If the result is less than 10%, I consider no awareness of breathing exercise as COVID-19 management among the participants.

The last part of the questionnaire is followed by knowledge of breathing exercise questionnaire. It was self modified questionnaire based on the examples of previous study. It is multiple choice question. In the questionnaire, a condition is given and the participants need to choose the correct breathing exercises that are able to used in the condition given from the question. The average knowledge of all questions are calculated. If the percentage of correct answer is 60% and above, it is consider participants have good awareness. If the percentage of

correct answer is between 30% to 60%, it consider moderate awareness. If the percentage is between 30% to 10%, it consider poor awareness. If the result is less than 10%, I consider no awareness of breathing exercise as COVID-19 management among the participants.

Besides, in the questionnaire there is a page which show the illustration of the breathing exercises. This is because there are some participants may performed the breathing exercise before but do not know the name of the exercise. The picture of the breathing exercises can give a clearer image to the participants and help them in answering the questionnaire.

Before the questionnaire is used to conduct the research. Validation of the questionnaire had done. Total number of 5 lecturers are involved in the validation of the questionnaire. After the modification and correction of the questionnaire based on lecturers' advise, the questionnaire is sent to the participants to conduct the study.

### **3.8 Procedure**

The study is conducted by giving the questionnaire to the participants in a survey form after the ethical approval by the UTAR Scientific and Ethical Review Committee was received. The questionnaire is given through google form to the participants. The questionnaire consist 5 parts

I) Informed consent

II) Personal data protection statement

III) Demographic of data

IV) Awareness of breathing exercise as COVID-19 management

V) Knowledge of breathing exercise as COVID-19 management

The questionnaire are given through email, whatsapp, facebook, instsgram, microsoft teams and other social media prefered by the participants. The permission and consent of the participants were asked before they start the survey. They need to fill in all of the question in the questionnaire and encouraged to contact the researcher if there is any enquiry. The participants are encouraged to share the questionnaire to other participants who are fulfill the requirement of this study research. After the data is collected, the data are rearrange and analysis of the data would be done by using SPSS software.

### **3.9 Data Analysis**

Data analysis was done with IBM SPSS software statistics version 20. Descriptive analysis was done on the questionnaire and the data from the questionnaire are key into the IBM SPSS software. The mean score, standard deviation, and variance of the awareness and knowledge of breathing exercises among the participant are calculated. The result are made into table, a bar chart and pie chart form and the analysis of the data is done.



## **CHAPTER 4**

### **RESULTS**

#### **4.1 Chapter overview**

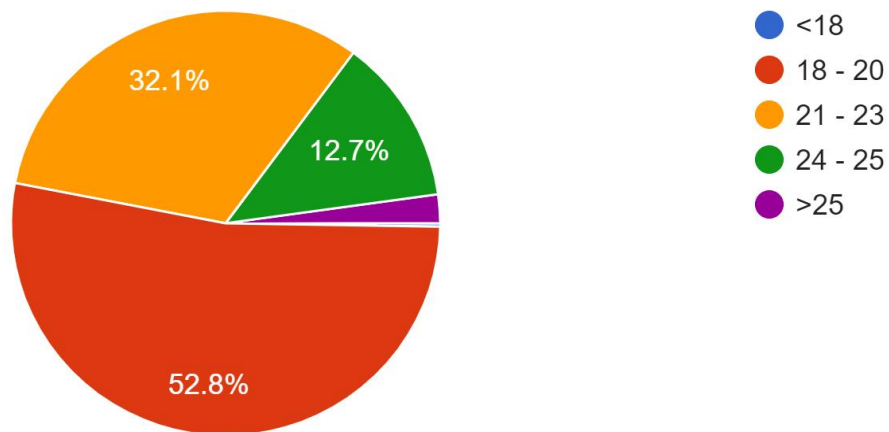
The following chapter features the findings after the data collection process for the research project. Demographic data of participants is presented first. Following that, the score and grouping of the outcome measures, results of the inferential tests and lastly hypothesis testing is elaborated. The results are being presented in the sequence of the relevant graphs, followed by a brief description and lastly the tabulation at the end of that component.

Of the 415 responses collected, 1 participant who did not give consent to process the data. Besides, there is one participant was in the exclusion criteria. Thus, the responds were removed from the data analysis process and eventually only 413 responses were processed in the final stage of the study.

#### **4.2 Demographic data**

This subsection highlights the demographic data of the participants in form of graphs, descriptions and lastly a table summarizing the overall subsection. The demographic data are include age, gender, campus, faculty and year of study.

#### 4.2.1 Age



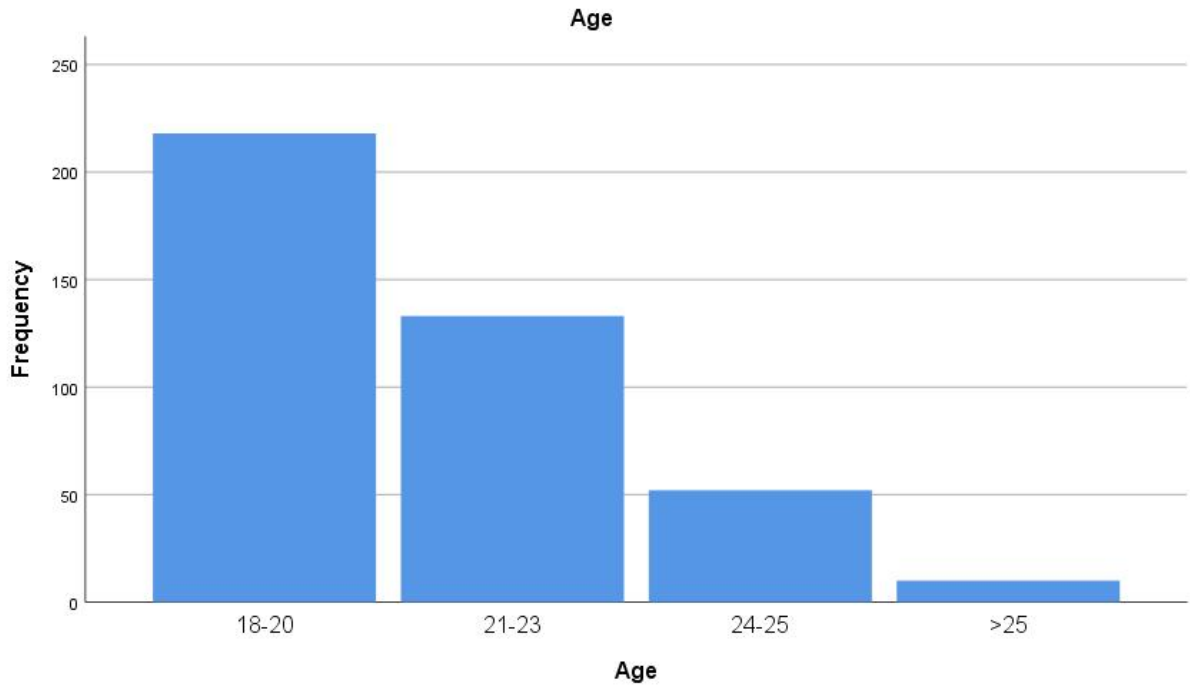


Figure 4.1: Age of participants.

Figure 4.1 illustrates the age of the participants of this study. The youngest age range of the participants are from 18 to 20 years old, which makes up 52.8% with 218 people. Next, the participants who are aged between 21 to 23 years old are occupying 32.1% with 133 people. Next, there are 12.7% of participants which stand for 52 people with aged range between 24 to 25 years old. Lastly, the eldest age range of the participants are above 25 years old, which makes up 2.4% with 10 people.

#### 4.2.2 Gender

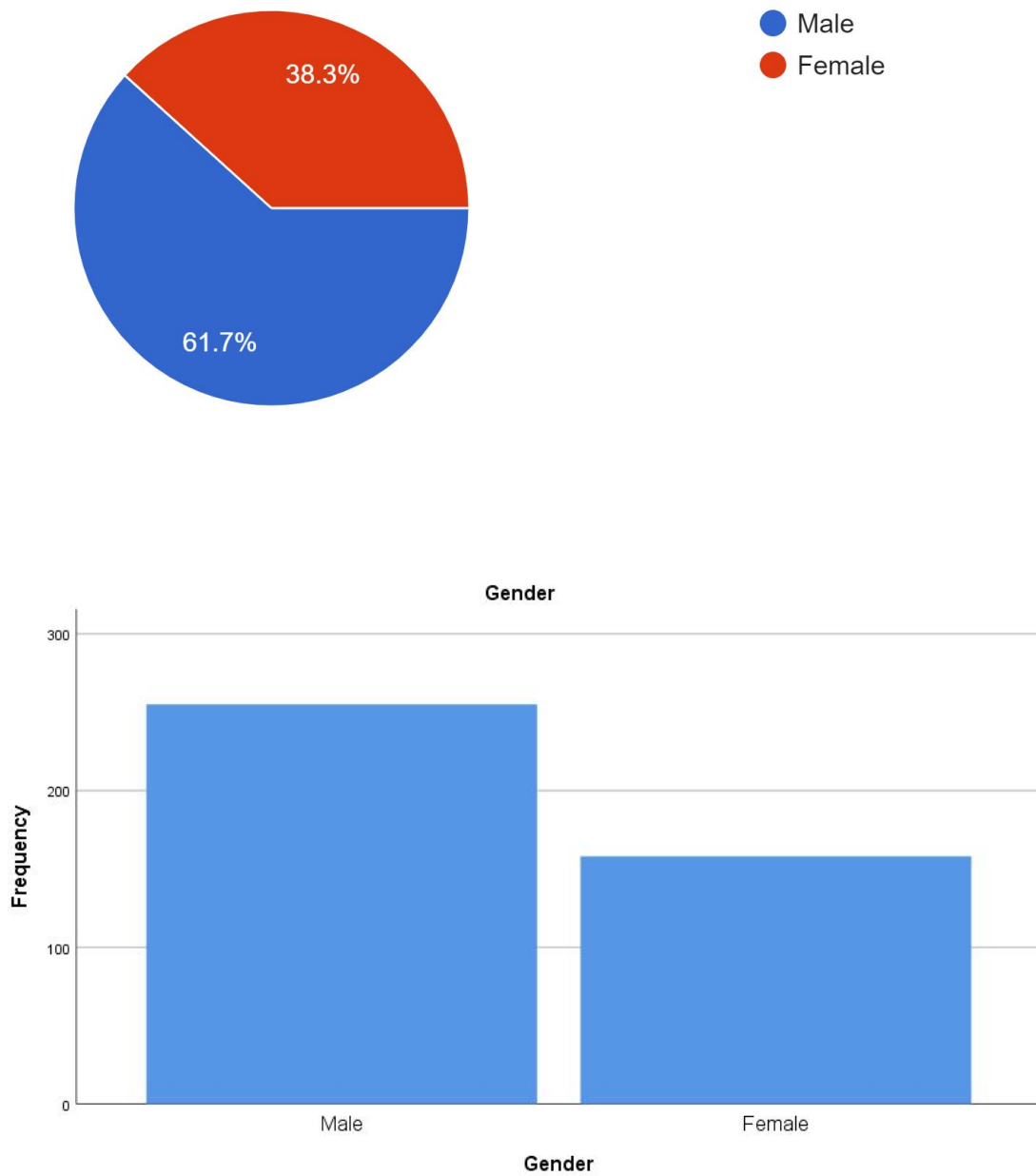
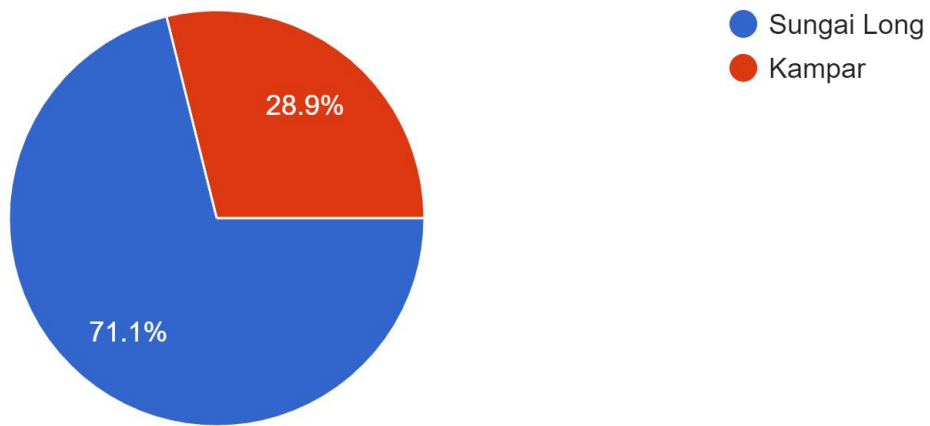


Figure 4.2: Gender of participants.

Figure 4.2 displays the gender distribution of the current study. There are 255 male students recruited which is 61.7%, and 158 female students which represent 38.3% of the participants.

#### 4.2.3 Campus



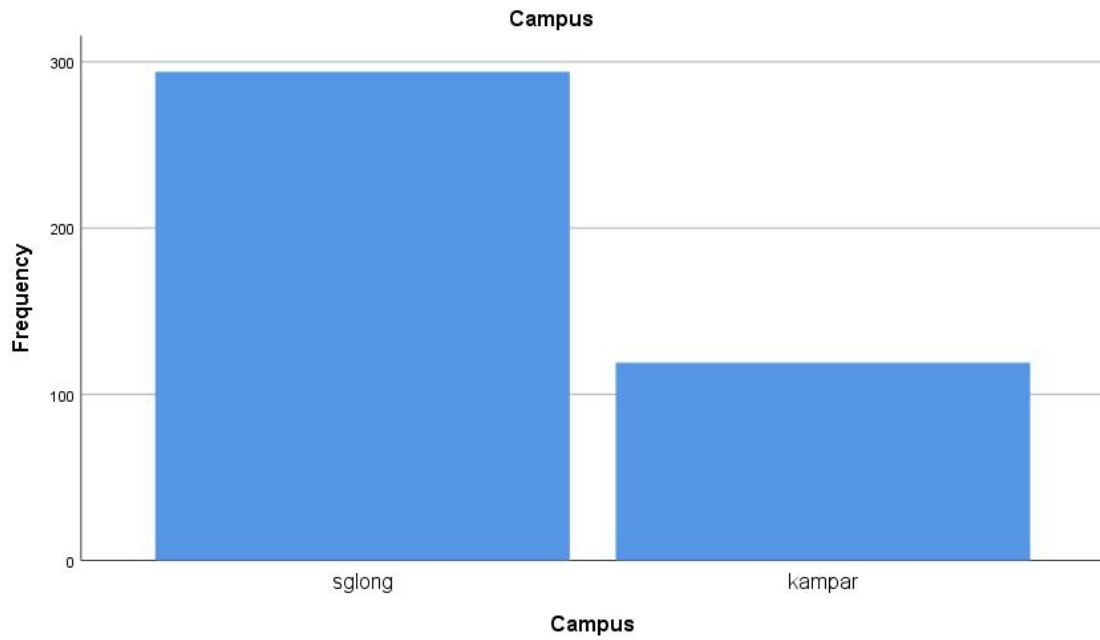


Figure 4.3 shows the distribution of the participants for the university campus. From the data, 71.1 participants are from Sungai Long area, which represent 294 people. On the other site, 28.9% of participants are from Kampar area, which represents 119 people.

#### 4.2.4 Faculty

FMHS	Faculty of Medicine and Health Sciences (FMHS)
LKC FES	Faculty of Engineering and Science (LKC FES)
FAM	Faculty of Accountancy and Management (FAM)
FCI	Faculty of Creative Industries (FCI)

FEGT	Faculty of Engineering and Green Technology (FEGT)
FICT	Faculty of Information and Communication Technology (FICT)
FSC	Faculty of Science (FSc)
FBF	Faculty of Business and Finance (FBF)
FAS	Faculty of Arts and Social Science (FAS)
ICS	Institute of Chinese Studies (ICS)
CFS	Centre of Foundation Studies

Table 4.1 Faculty distributon

		<b>Faculty</b>			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	FMHS	66	16.0	16.0	16.0
	LKC FES	44	10.7	10.7	26.6
	FAM	37	9.0	9.0	35.6
	FCI	22	5.3	5.3	40.9
	FEGT	25	6.1	6.1	47.0
	FICT	35	8.5	8.5	55.4
	FSC	41	9.9	9.9	65.4
	FBF	47	11.4	11.4	76.8
	FAS	35	8.5	8.5	85.2
	ICS	6	1.5	1.5	86.7
	CFS	55	13.3	13.3	100.0
	Total	413	100.0	100.0	

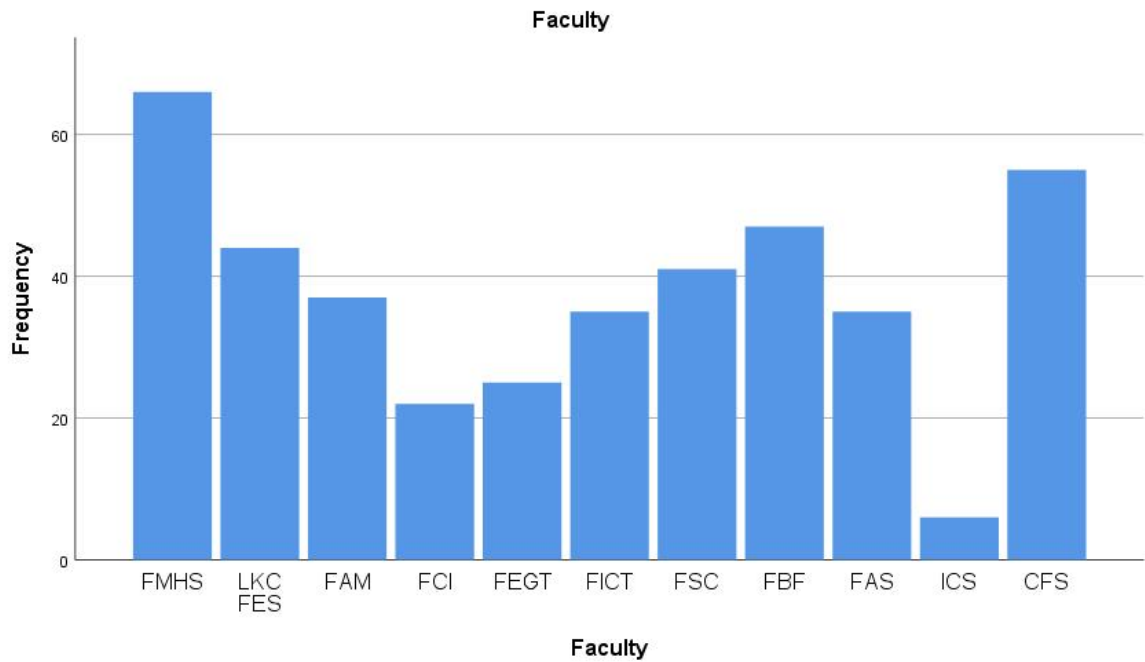


Table 4.1 and figure 4.4 shows the faculty distribution of the participants. The faculty with the most participants is FMHS, which are 66 participants (16.0%). The faculty with the least participants is ICS, which are 6 participants (1.5%). For other faculties, LKS FES with 44 participants (10.7%), FAM with 37 participants (9.0%), FCI with 22 participants (5.3%), FEGT with 25 participants (6.1%), FICT with 35 participants (8.5), FSC with 41 participants (9.9%), FBF with 47 participants (11.4%), FAS with 35 participants (8.5), CFS with 55 participants (13.3%).



#### 4.2.5 Year of study

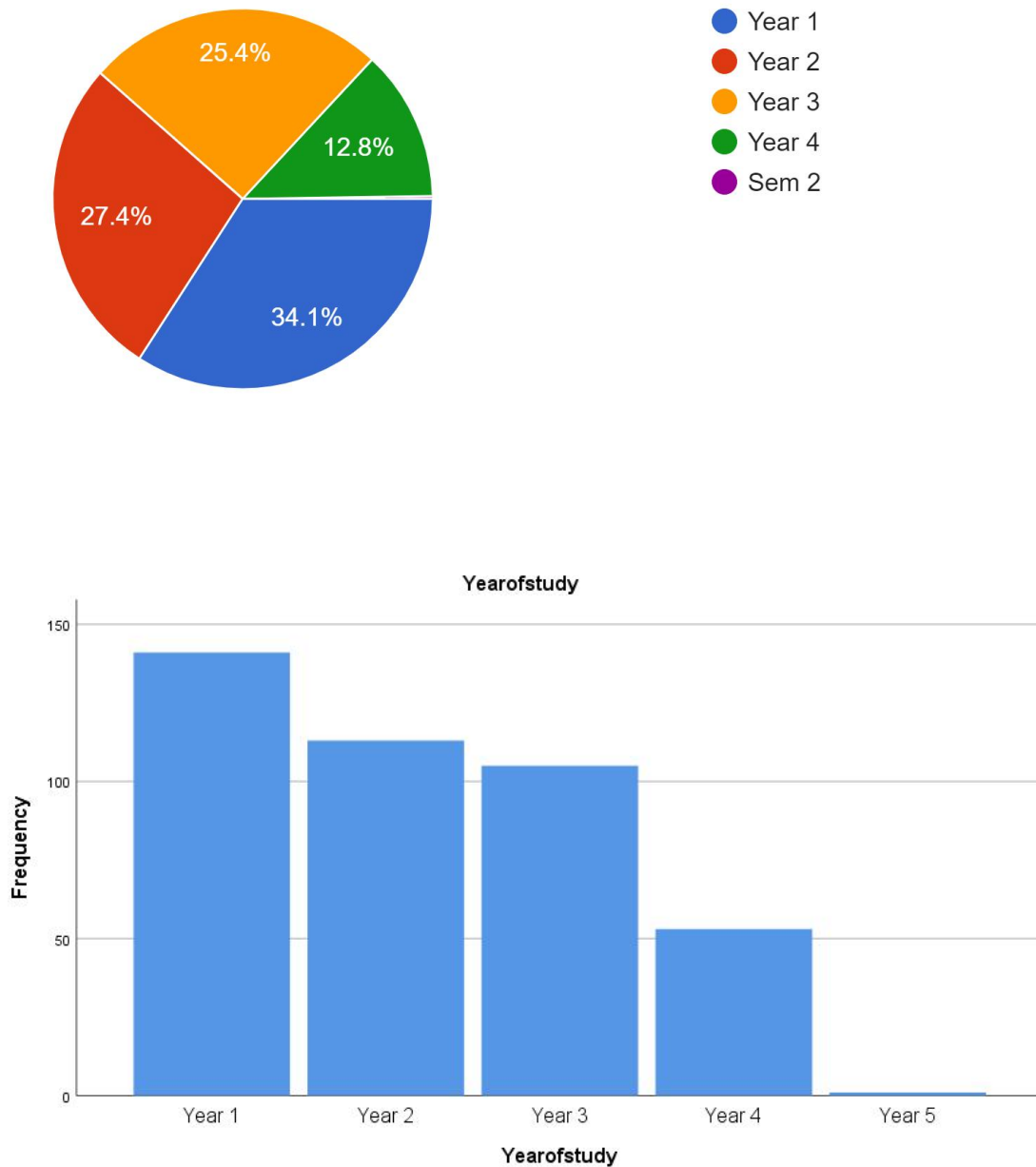


Figure 4.5 shows the year of study among the participants. There are 34.1% of participants are from year 1, which are 141 people. For year 2 students, there are 27.4%, which are 113 participants. Next, there are 25.4% of participants are from year

3, which is 105 people. There are 12.8% participants are from year 4, which is 53 people. Lastly, there is 1 participant is from year 5, which is 0.03%.

#### 4.2.6 Demographic data regarding breathing exercise

Have you heard of breathing exercise?

413 responses

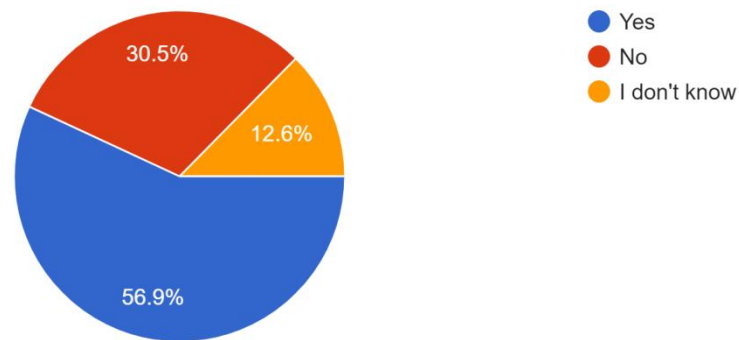


Figure 4.6 shows that whether the participants had heard about breathing exercises or not. From the data, out of 413 responds, 56.9% of the participants which represented 235 people had heard about breathing exercise before. There are 30.5% of participants do not hear about breathing exercise, which is 126 people. Lastly, there are 52 participants (12.6%) are not sure and do not know that whether they had heard about breathing exercise or not.

#### 4.2.7 Types of breathing exercise heard before

<b>Breathing exercise</b>	<b>Frequency</b>
Deep breathing	226 (54.7)
Diaphragmatic breathing	114 (27.6)
Thoracic expansion exercise	82 (19.9)
Pursed lip breathing	69 (16.7)
Square breathing	56 (13.6)
Huffing	67 (16.2)
Coughing	201 (48.7)
Apical breathing	50 (12.1)
Paradoxical breathing	41 (9.9)
Incentive spirometry	93 (22.5)
I don't know	172 (41.6)

Tale 4.2

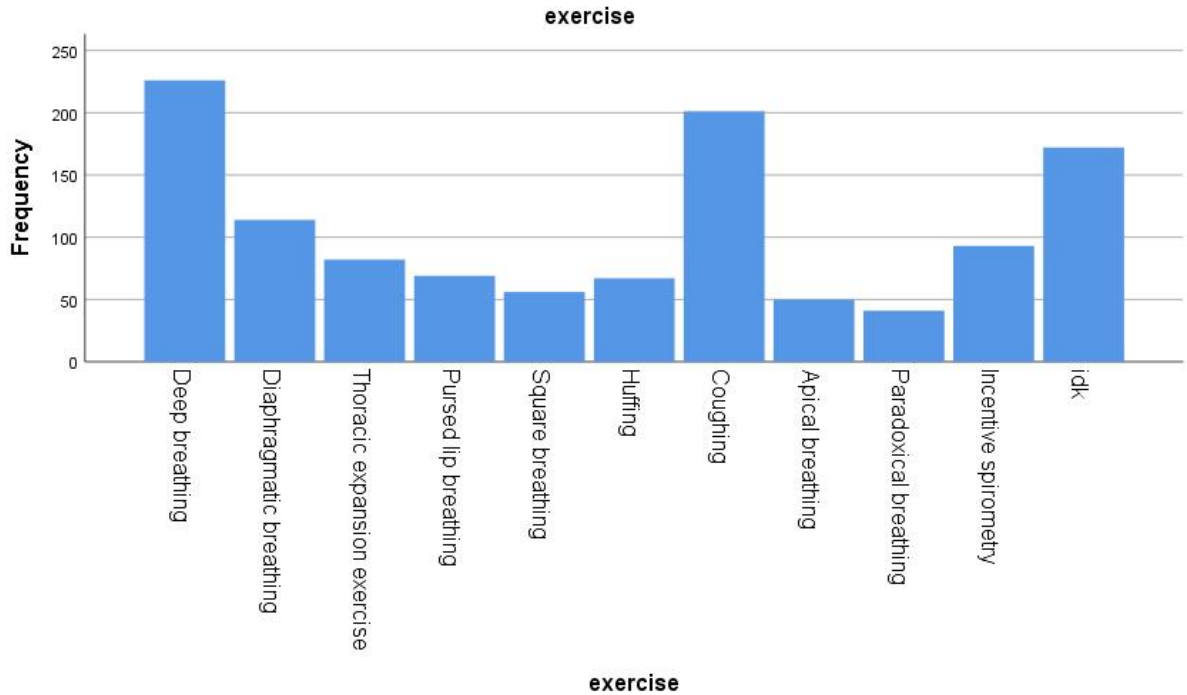


Table 4.2 and figure 4.7 shows the types of breathing exercises that participants had heard before. Out of 413 participants, there are 226 (54.7%) people had heard of deep breathing, for diaphragmatic breathing is 114 (27.6%) people, for thoracic expansion exercise is 82 (19.9%) people, for pursed lip breathing is 69 (16.7%) people, for square breathing is 56 (13.6%) people, for huffing is 67 (16.2%) people, for coughing is 201 (48.7%) people, for apical breathing is 50 (12.1) people, for paradoxical breathing is 41 (9.9%) people, for incentive spirometry is 93 (22.5%) people. Next, out of 413 participants, there are 172 (41.6%) of them do not know any of the breathing exercises.

#### 4.2.8 Sources of information

<b>Sources of information</b>	<b>Frequency (%)</b>
Healthcare worker	91 (22.0)
Family / friends	78 (18.9)
Social media / internet	119 (28.8)
TV / radio	39 (9.4)
Books / magazine	56 (13.6)
Newspaper	23 (5.6)
University society / event	21 (5.1)
Yoga trainer	30 (7.3)
None	213 (51.6)

Table 4.3

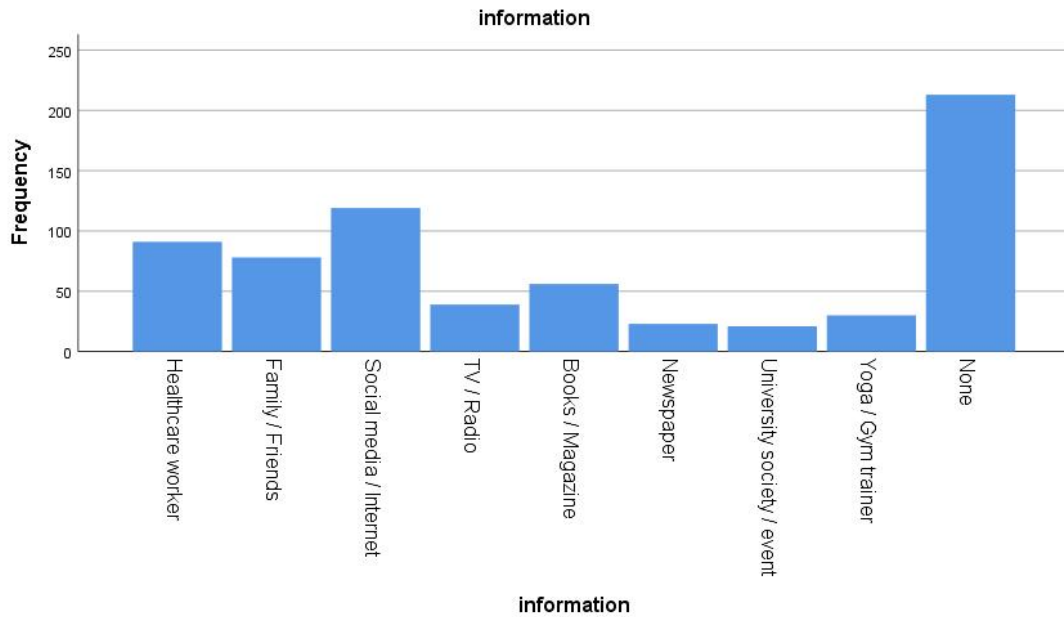


Table 4.3 and figure 4.8 shows the sources of information regarding breathing exercise among the 413 participants. It is a multiple choices question, thus participants can choose more than 1 answer. Out of 413 participants, there are 213 participants mention none of source of information regarding breathing exercise, which is 51.6%. For other source of information, healthcare worker is 91 people with 22%, family / friends is 78 people with 18.9%, social media / internet is 119 people with 28.8%, TV / radio is 39 people with 9.4%, books / magazine is 56 people with 13.6%, newspaper is 23 people with 5.6%, university society / event is 21 people with 5.1% and yoga / gym trainer is 30 people with 7.3%

#### 4.2.9 Have you performed any breathing exercise?

Have you performed any breathing exercise?

413 responses

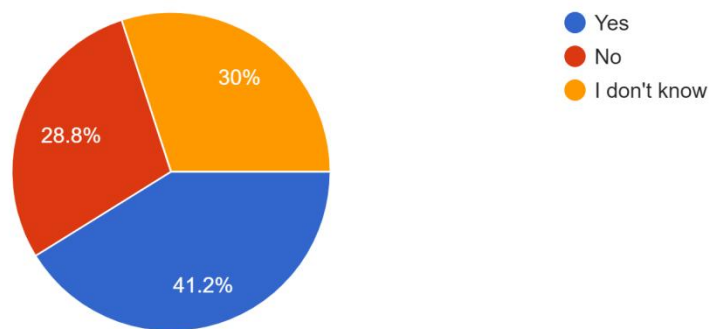


Figure 4.9 shows that whether the participants had performed the breathing exercises or not. From the data obtained, out of 413 responses, 41.2% of participants, which is 170 people, mention that they had performed breathing exercise before. There are 28.8% of participants who state that they never performed breathing exercise before. The amount of people are 119. Next, there are 124 participants (30.0%) who are not sure and do not know whether they had performed breathing exercise or not.

#### 4.2.10 Have you been taught to perform any breathing exercise?

Have you been taught to perform any breathing exercise? (Skip next question if answer 'no' or 'I don't know')

413 responses

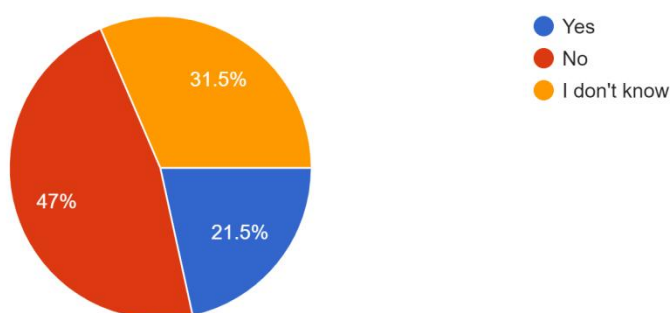


Figure 4.10 shows that whether the participants had been taught to perform any breathing exercises. From the data obtained, out of 413 responds, 21.5% of participants which is 89 people, mention that they had been taught to perform breathing exercise. There are 47.0% of participants state that they never perform breathing exercise before. The amount of people are 194. Next, there are 130 participants (31.5%) are not sure and do not know that whether they had perform breathing exercise or not.

Demographic data	Frequency (%)	Mean (Std Dev)
<b>Age</b>		
18<	0 (0)	
18 - 20	218 (52.8)	



21 - 23	133 (32.1)	
24 - 25	52 (12.7)	
25>	10 (2.4)	
<b>Gender</b>		
Male	255 (61.7)	
Female	158 (38.3)	
<b>Campus</b>		
Sungai Long	294 (71.1)	
Kampar	119 (28.9)	
<b>Faculty</b>		
FMHS	66 (16.0)	
LKC FES	44 (10.7)	
FAM	37 (9.0)	
FCI	22 (5.3)	
FEGT	25 (6.1)	
FICT	35 (8.5)	
FSC	41 (9.9)	
FBF	47 (11.4)	
FAS	35 (8.5)	
ICS	6 (1.5)	
CFS	55 (13.3)	
<b>Year of study</b>		
Year 1	141(34.1)	
Year 2	113 (27.4)	
Year 3	105 (25.4)	
Year 4	53 (12.8)	
Year 5	1 (0.02)	

<b>Have you heard of breathing exercise?</b> Yes No I don't know	235 (56.9) 126 (30.5) 52 (12.6)	
<b>Which breathing exercise have you heard before?</b> Deep breathing Diaphragmatic breathing Thoracic expansion exercise Pursed lip breathing Square breathing Huffing Coughing Apical breathing Paradoxical breathing Incentive spirometry I don't know	226 (54.7) 114 (27.6) 82 (19.9) 69 (16.7) 56 (13.6) 67 (16.2) 201 (48.7) 50 (12.1) 41 (9.9) 93 (22.5) 172 (41.6) 	
<b>Source of information</b> Healthcare worker Family / friends Social media / internet TV / radio Books / magazine Newspaper University society / event Yoga trainer None	91 (22.0) 78 (18.9) 119 (28.8) 39 (9.4) 56 (13.6) 23 (5.6) 21 (5.1) 30 (7.3) 213 (51.6)	

<b>Have you performed any breathing exercise?</b> Yes No I don't know	170 (41.2) 119 (28.8) 124 (30.0)	
<b>Have you been taught to perform any breathing exercise?</b> Yes No I don't know	89 (21.5) 194 (47.0) 130 (31.5)	

Table 4.4 Demographic data of participants

### 4.3 Question

The following part is the results of the questionnaire to assess the awareness and knowledge of breathing exercise as COVID-19 management among the participants. Figures and table are shown to illustrate the result.

#### 4.3.1 Questions regarding awareness of breathing exercise as COVID-19 management

Based on what you think, which of the following are the effects of COVID-19?	Yes n (%)	No n (%)	Total n (100%)
Shortness of breath	318 (77.0)	95 (23.0)	413

Phlegm production	214 (51.8)	199 (48.2)	413
Reduce air entry	226 (54.7)	187 (45.3)	413
Damage of lungs	254 (61.5)	159 (38.5)	413
Fatigue	189 (45.8)	224 (54.2)	413
Anxiety	167 (40.4)	246 (59.6)	413
Severe cough	342 (82.8)	71 (11.2)	413
Increase blood pressure	117 (28.3)	296 (71.7)	413
Decrease blood pH	70 (16.9)	343 (83.1)	413
Reduce oxygen level	194 (47.0)	219 (53.0)	413
I don't know	35 (8.5)	378 (91.5)	413

Table 4.5 show the responds from the participants regarding the effects of COVID-19 on the respiratory system. All of the options are the correct answer regarding the effects brought by the COVID-19. The option with the most selection is sever cough which is 342 participants (82.8%). Most of the participants are aware that COVID-19 will lead to severe cough. The option with the least selection is decrease blood pH, which are 70 participants (16.9%). Most of the participants not aware about this, COVID-19 can lower the oxygen level and eventually lower the blood pH (Kato et al, 2004). Besides, there are 35 respondents (8.5%) who completely don't know about effects of COVID-19.

Based on what you think, which of the following are the effects of breathing exercise?	Yes n (%)	No n (%)	Total (100%)
Reduce shortness of breath	282 (68.3)	131 (31.7)	413
Clear phlegm	181 (43.8)	232 (56.2)	413

Increase air entry	227 (55.0)	186 (45.0)	413
Increase lung volume	224 (54.2)	189 (45.8)	413
Reduce fatigue	162 (39.2)	251 (60.8)	413
Reduce anxiety	171 (41.4)	242 (58.6)	413
Train respiratory muscle	225 (54.5)	188 (45.5)	413
Reduce the high blood pressure	118 (28.6)	295 (77.4)	413
Increase the low blood pH	68 (16.5)	345 (83.5)	413
Increase oxygen level	219 (53.0)	194 (47.0)	413
I don't know	88 (21.3)	325 (78.7)	413

Table 4.6 show the responds from the participants regarding the effects of breathing exercises that are able to affect the COVID-19 symptoms. All of the options are the correct answer regarding the effects of breathing exercise. The option with the most selection is reducing shortness of breath / difficult in breathing, which are 282 people with 68.3%. Most of them have good awareness regarding breathing exercise can reduce shortness of breath. On the other site, the option with the least selection is increase the low blood pH which is 68 people with 16.5%. The awareness regarding this option is low among the participants. Breathing exercise can increase the oxygen intake that will normalize the blood pH and prevent us from respiratory acidosis (Kato et al, 2004). Besides, there are 88 participants with 21.3% selected “I don't know” for this questions.

#### 4.3.2 Question regarding knowledge of breathing exercise as COVID-19 management

Based on what you think, which of the following breathing techniques helps to relief the symptom of shortness of breath/difficulty in breathing among covid-19 positive patients?		
	Yes n (%)	Mean (Std dev)
Deep breathing*	181 (43.8)	
Diaphragmatic breathing	114 (27.6)	
Thoracic expansion exercise	92 (22.3)	
Pursed lip breathing*	135 (32.7)	
Square breathing*	129 (31.2)	
Huffing	64 (15.5)	
Coughing	58 (14.0)	
Apical breathing	49 (11.9)	
Paradoxical breathing	34 (8.2)	
Incentive spirometry	37 (9.0)	
I don't know	135 (32.7)	

\* indicate the answer

Table 4.7 showed the respond from the participants regarding management of shortness of breath / difficult in breathing during covid-19. Among 413 participants, only 181 (43.8%) people had answered deep breathing, 135 (32.7%) people had answered pursed lip breathing and 129 (31.2%) people answered square breathing.

<b>Based on what you think, which of the following breathing techniques helps to clear phlegm/secretion among covid-19 positive patients?</b>		
	Yes n (%)	Mean (Std dev)
Deep breathing	80 (19.4)	
Diaphragmatic breathing	69 (16.7)	
Thoracic expansion exercise	71 (17.2)	
Pursed lip breathing	66 (16.0)	
Square breathing	44 (10.7)	
Huffing*	99 (24.0)	
Coughing*	142 (34.4)	
Apical breathing	41 (9.9)	
Paradoxical breathing	24 (5.8)	
Incentive spirometry	26 (6.3)	
I don't know	171 (41.4)	

\* indicate the answer

Table 4.8 showed the responds from the participants regarding the breathing technique to clear phlegm and secretion. Out of 413 participants, 99 (24%) of them have the knowledge regarding huffing can help in clearing phlegm and secretion. For coughing exercise, there are 142 (34.4%) participants had the knowledge regarding this breathing exercise.

<b>Based on what you think, which of the following breathing techniques helps in anxiety management/provide relaxation among-19 positive patients?</b>		
	<b>Yes n (%)</b>	<b>Mean (Std dev)</b>
Deep breathing*	134 (32.4)	
Diaphragmatic breathing	80 (19.4)	
Thoracic expansion exercise	61 (14.8)	
Pursed lip breathing*	108 (26.2)	
Square breathing*	95 (23.0)	
Huffing	50 (12.1)	
Coughing	33 (8.0)	
Apical breathing	23 (5.6)	
Paradoxical breathing	19 (4.6)	
Incentive spirometry	28 (6.8)	
I don't know	185 (44.8)	

\* indicate the answer

Table 4.9 showed the responds from the participants regarding the breathing technique that help in anxiety management. Among 413 participants, only 134 (32.4%) people had answered deep breathing, 108 (26.2%) people had answered pursed lip breathing and 95 (23.0%) people answered square breathing.



<b>Based on what you think, which of the following breathing techniques helps in increasing the air entry to lungs among covid-19 positive patients?</b>		
	Yes n (%)	Mean (Std dev)
Deep breathing*	157 (38.0)	
Diaphragmatic breathing*	131 (31.7)	
Thoracic expansion exercise*	132 (32.0)	
Pursed lip breathing	64 (15.5)	
Square breathing	67 (16.2)	
Huffing	47 (11.4)	
Coughing	34 (8.2)	
Apical breathing	54 (13.1)	
Paradoxical breathing	42 (10.2)	
Incentive spirometry*	92 (22.3)	
I don't know	164 (39.7)	

\* indicate the answer

Table 4.10 showed the responds from the participants regarding the breathing technique that help in increasing the air entry to the lungs among COVID-19 patients. Out of 413 participants, 157 (38.0%) of them answered deep breathing, 131 (31.7%) of them answered diaphragmatic breathing, 132 (32.0%) of them answered thoracic expansion exercise and 92 (22.3%) of them answered incentive spirometry.

<b>Based on what you think, which of the following breathing techniques helps in respiratory muscles training among covid-19 positive patients?</b>		
	Yes n (%)	Mean (Std dev)
Deep breathing*	123 (29.8)	
Diaphragmatic breathing*	126 (30.5)	
Thoracic expansion exercise*	117 (28.3)	
Pursed lip breathing	68 (16.5)	
Square breathing	58 (14.0)	
Huffing	52 (12.6)	
Coughing	40 (9.7)	
Apical breathing	61 (14.8)	
Paradoxical breathing	48 (11.6)	
Incentive spirometry*	99 (24.0)	
I don't know	172 (41.6)	

\* indicate the answer

Table 4.11 showed the responds from the 413 participants about breathing exercise for respiratory muscle training. Among all the participants, 123 (29.8%) of them know about deep breathing, 126 (30.5%) people know about diaphragmatic breathing, 117 (28.3) of them know about thoracic expansion exercise and 99 (24.0) of them know about incentive spirometry can help in respiratory muscle training.

<b>Based on what you think, which of the following breathing techniques helps in improving lung volume among covid-19 positive patients?</b>		
	Yes n (%)	Mean (Std dev)
Deep breathing*	154 (37.3)	
Diaphragmatic breathing*	127 (30.8)	
Thoracic expansion exercise*	142 (34.4)	
Pursed lip breathing	64 (15.5)	
Square breathing	62 (15.0)	
Huffing	46 (11.1)	
Coughing	38 (9.2)	
Apical breathing	56 (13.6)	
Paradoxical breathing	37 (9.0)	
Incentive spirometry*	86 (20.8)	
I don't know	172 (41.6)	

\* indicate the answer

Table 4.12 illustrate the knowledge among the participants regarding breathing technique that can help in improving lung volume. Among 413 of them, 154 (37.3%) had answered deep breathing, 127 (30.8%) of them had answered diaphragmatic breathing, 142 (34.4) of them had answered thoracic expansion exercise and 86 (20.8%) of them had answered incentive spirometry.

Based on what you think, which of the following breathing techniques helps to reduce fatigue among covid-19 positive patients?		
	Yes n (%)	Mean (Std dev)
Deep breathing*	144 (34.9)	
Diaphragmatic breathing	89 (21.5)	
Thoracic expansion exercise	70 (16.9)	
Pursed lip breathing*	120 (29.1)	
Square breathing*	126 (30.5)	
Huffing	50 (12.1)	
Coughing	57 (13.8)	
Apical breathing	37 (9.0)	
Paradoxical breathing	27 (6.5)	
Incentive spirometry	46 (11.1)	
I don't know	184 (44.6)	

\* indicate the answer

Table 4.13 illustrate the responds from the participants regarding breathing technique that can help in reducing fatigue among COVID-19 patients. Among 413 participants, 144 (34.9%) people had answered deep breathing, 120 (29.1%) had answered pursed lip breathing and 126 (30.5) of them had answered square breathing.

#### 4.4 Awareness and Knowledge Level

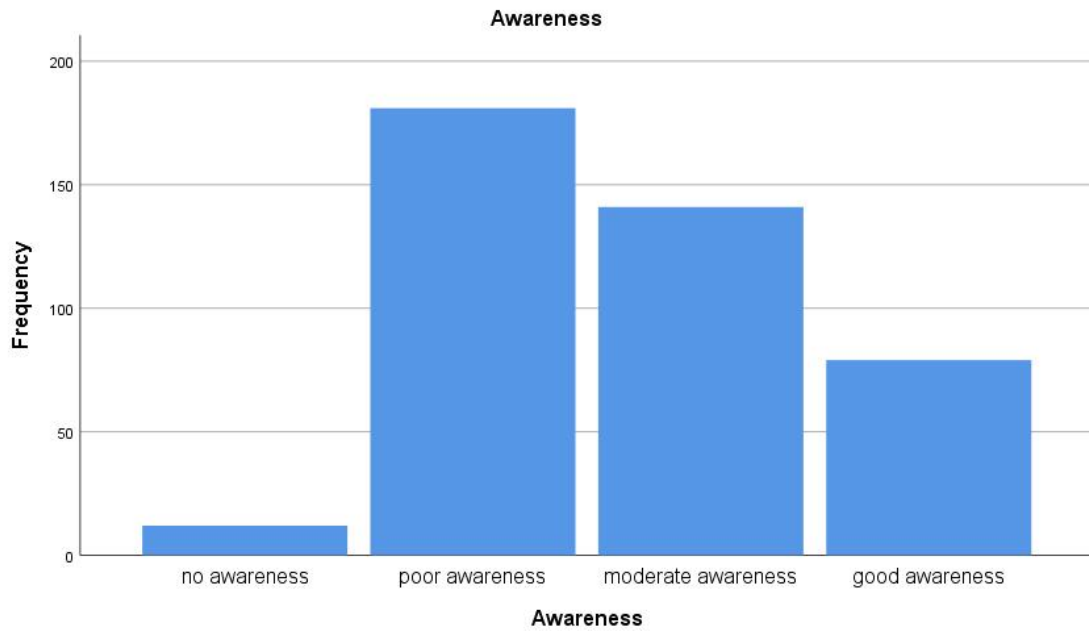
The score of the participants are key into SPSS and they are divided into groups. Which are “no awareness”, “poor awareness”, “moderate awareness” and “good awareness”

##### 4.4.1 Awareness level of breathing exercise as COVID-19 management

Table 4.14: Awareness level of breathing exercise as COVID-19 management

	N (%)	M (SD)
No awareness	12 (3.0)	1.69 (0.809)
Poor awareness	181 (43.8)	
Moderate awareness	141 (34.1)	
Good awareness	79 (19.1)	

Figure 4.11: Awareness level of breathing exercise as COVID-19 management



From the table and figure above, it showed the awareness level of breathing exercise as COVID-19 management among UTAR students. The highest number is 181 respondents (43.8%) with poor awareness, follow by 141 respondents (34.1%) with moderate awareness. 79 respondents (19.1%) have good awareness while 12 respondents (3.0%) have no awareness

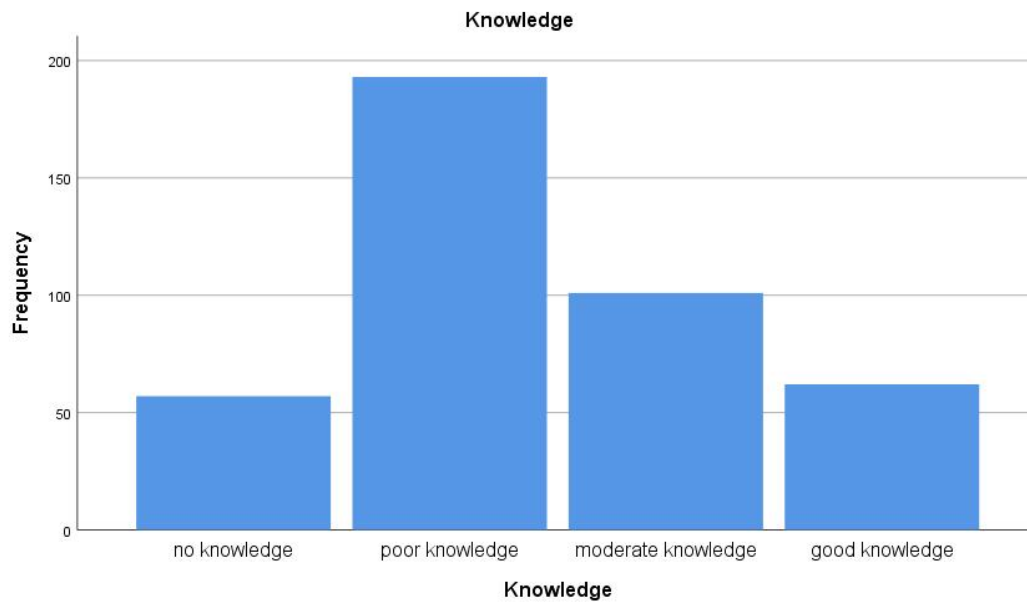
#### 4.4.2 Knowledge level of breathing exercise as COVID-19 management

Table 4.15: Knowledge level of breathing exercise as COVID-19 management

	Frequency (%)	M (SD)
No knowledge	57 (13.8)	1.41 (0.905)
Poor knowledge	193 (46.7)	
Moderate knowledge	101 (24.5)	

Good knowledge	62 (15.0)	
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Figure 4.12: Knowledge level of breathing exercise as COVID-19 management



From the table and figure above, it showed the knowledge level of breathing exercise as COVID-19 management among UTAR students. The highest number is 193 respondents (46.7%) with poor knowledge, follow by 101 respondents (24.5%) with moderate knowledge. 62 respondents (15.0%) have good knowledge while 57 respondents (13.8%) have no knowledge.

#### 4.4.5 Awareness comparison between campus

	Sungai Long N (%)	Kampar N (%)
No awareness	7 (2.3)	5 (4.3)
Poor awareness	127 (42.6)	54 (47.0)
Moderate awareness	112 (37.6)	29 (25.2)
Good awareness	52 (17.5)	27 (23.5)
Total N (%)	298 (100)	115 (100)

Table 4.16 Awareness comparison between campus

Table 4.16 compare the awareness level between students in Sungai Long and Kampar area. For Sungai Long, number of participants for good awareness is 52 (17.5), moderate awareness is 112 (37.6), poor awareness is 127 (42.6) and no awareness is 7 (2.3). For Kampar area, number of students with good awareness is 27 (23.5), moderate awareness is 29 (25.2), poor awareness is 54 (47.0) and no awareness is 5 (4.3).



#### 4.4.6 Knowledge comparison between campus

	Sungai Long N (%)	Kampar N (%)
No knowledge	49 (16.4)	8 (7.0)
Poor knowledge	132 (44.3)	61 (53.0)
Moderate knowledge	71 (23.8)	30 (26.1)
Good knowledge	46 (15.4)	16 (13.9)
Total N (%)	298 (100)	115 (100)

Table 4.17 Knowledge comparison between campus

Table 4.17 compare the knowledge level between students in Sungai Long and Kampar area. For Sungai Long, number of participants for good knowledge is 46 (15.4), moderate knowledge is 71 (23.8), poor knowledge is 132 (44.3) and no knowledge is 49 (16.4). For Kampar area, number of students with good knowledge is 16 (13.9), moderate knowledge is 30 (26.1), poor knowledge is 61 (53.0) and no knowledge is 8 (7.0).

#### 4.4.5 Awareness comparison between faculty

	Health science (FMHS) N(%)	Non health science N (%)
No awareness	0 (0.0)	12 (3.4)
Poor awareness	2 (3.0)	179 (51.6)
Moderate awareness	12 (18.0)	129 (37.2)
Good awareness	52 (79.0)	27 (7.8)
Total N (%)	66 (100)	347 (100)

Table 4.18 Awareness comparison between faculty

Table 4.18 compare the awareness level between health science students and non health science students. For health science students, number of participants for good awareness is 52 (79.0), moderate awareness is 12 (18.0), poor awareness is 2 (3.0) and no awareness is 0 (0.0). For non health science students, number of students with good awareness is 27 (7.8), moderate awareness is 129 (37.2), poor awareness is 179 (51.6) and no awareness is 12 (3.4).

#### 4.4.6 Knowledge comparison between faculty

	Health science (FMHS) N(%)	Non health science N (%)
No knowledge	0 (0.0)	57 (16.4)
Poor knowledge	7 (10.6)	186 (53.6)
Moderate knowledge	15 (22.7)	86 (24.8)
Good knowledge	44 (66.7)	18 (5.2)
Total N (%)	66 (100)	347 (100)

Table 4.19 Knowledge comparison between faculty

Table 4.16 compare the knowledge level between health science students and non health science students. For health science students, number of participants for good knowledge is 44 (66.7), moderate knowledge is 15 (22.7), poor knowledge is 7 (10.6) and no knowledge is 0 (0.0). For non health science students, number of students with good knowledge is 18 (5.2), moderate knowledge is 86 (24.8), poor knowledge is 186 (53.6) and no knowledge is 57 (16.4).

## 4.6 Data Analysis

### 4.6 Distribution of the variables data

#### Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Age	.321	413	.000	.757	413	.000
Gender	.402	413	.000	.616	413	.000
Campus	.449	413	.000	.568	413	.000
Faculty	.138	413	.000	.913	413	.000
Yearofstudy	.210	413	.000	.854	413	.000

a. Lilliefors Significance Correction

Table 4.20 Koimogorov-Sminova test

Table 4.20 shows the normality test Koimogorov-Sminova test on the demographic data including age group, gender, campus and faculty and year of study. The test has revealed that all of the components are not normally distributed ( $p$ -values  $< 0.05$ ). Therefore, non-parametric test is used to analyse the correlation between variables.

## **CHAPTER 5**

### **DISCUSSION**

#### **5.1 Chapter overview**

This chapter will outline the discussion on significant findings from the results sections in accordance with the research objectives. This chapter will also include the limitation of study, recommendations for future research as well as the conclusion of the research project.

#### **5.2 Discussion**

##### **5.2.1 Demographic data regarding breathing exercise**

From the responds of the participants about whether they had heard breathing exercise before, 413 (59.6%) answer yes, 126 (30.5%) answer no and 52 (12.6%). The percentage of yes is 59.6% which means more than half of the participants had heard about breathing exercise before. Next, the breathing exercise that participants heard before is deep breathing which is 226 people (54.7%). The breathing technique with the least selection is paradoxical breathing which is 41 people (9.9%). 177 people (42.9%) had never heard breathing exercise before. It

is a high percentage of participants do not recognized breathing exercise and this is not a good sign.

Next, for the source of information, the source with the most selection is social media / internet which is 119 people (28.8%). It shows that most of the participant in this study know about breathing exercise from social media. This actually can be a good idea for health care provider or educator to spread the awareness and knowledge of breathing exercise as many of the students nowadays are closely connect with social media. Besides, some of the participants heard about breathing exercise from healthcare worker, friends, newspaper, book and TV and yoga trainer.

Furthermore, 89 participants (21.5%) had been taught to perform breathing exercise. 194 (47.0%) participants never been taught to perform breathing exercises and 130 (31.5%) of them are not sure about this question. The amount of participant had been taught to perform breathing exercise is low. Thus more awareness need to be spread and more participant need to been taught how to perform breathing exercise correctly.

### **5.2.3 Awareness and knowledge level**

Based on the data obtained (table 4.17), for the level of awareness of breathing exercise as COVID-19 management, among UTAR students. There are 79 of participants (19.1%) have good awareness. 79 of them score above 60% among all of the questions. The participants with moderate awareness is 141

people (34.1%). They scored between 30% to 60%. The participants with poor awareness is 43.8% which is 141 people. They scored between 10% to 30%. Lastly they are 12 participants (3.0%) had answered less than 10%, which indicate no awareness regarding breathing exercise.

For the level of knowledge of breathing exercise as COVID-19 management, among UTAR students. There are 62 of participants (15.0%) have good knowledge. 62 of them score above 60% among all of the questions. The participants with moderate knowledge is 101 people (24.5%). They scored between 30% to 60%. The participants with poor knowledge is 46.7% which is 193 people. They scored between 10% to 30%. Lastly they are 57 participants (13.8%) had answered less than 10%, which indicate no knowledge regarding breathing exercise.

The level of awareness and knowledge among the university students are consider no enough. More awareness need to be spread among the participants thus the students can master the skill for self management of the COVID-19.

### **5.2.3 Awareness and knowledge level comparison.**

Based on the result (4.4.5 & 4.4.6), it shows that the level of awareness and knowledge of breathing exercise is higher among the students in Sungai Long compare to Kampar area. However, the sample size between Sungai Long and Kampar is not equal enough, thus more further study can be done regarding this area. Besides, the awareness and knowledge of breathing exercise is higher compare to non health science students. This is due to some health science students had learn about breathing exercise in their syllabus and lecture class. The

awareness and knowledge need to be improve since they have less chance to explore in this area.

### **5.3 Limitation of study**

The first limitation is regarding the questionnaire of awareness of breathing exercise as COVID-19 management and knowledge of breathing exercise as COVID-19 management that used in the research. The questionnaire is a self modified questionnaire, thus it may lack of reliability and validity compared to other pre-existing questionnaire. Besides, the number of lecturers involved in questionnaire validation may be not enough and can be increase the number to ensure the validity and reliability.

The next limitation that is exist in the study is the response rate of the participants. The researcher has personally messaged and sent the questionnaire to almost all the students that is reachable through the university's learning platform Microsoft Teams. However, less than 50% of the participants responded to the survey and this may cause an underrepresentation of certain groups of students which should be taken into consideration. Nevertheless, the research project has reached and exceeded the estimated number of sample size which should be able to contribute its findings in a significant manner. In addition, the respond rate from Kampar area is much lesser compare to Sungai Long area and this is also one of the problem faced during data collection.



Lastly, as the study is done only among the population of UTAR students, it is important to note that the majority of the racial distribution is Chinese students. As a multiracial country such as Malaysia, the study may involved more students from other races, otherwise the result obtained may not be relevant as the other races are significantly underrepresented in the study. Moreover, the study is also done only in one institution which should be expanded in the future research.

#### 5.4 Recommendation for future research

For the recommendations for future research, it is encouraged that the researchers should seek to conduct physical face-to-face or one-to-one interviews with the participants for better validity of the results. The researchers can clarify the questions asked and the type of responses required which may be able to make the data cleaning process smoother. Besides, the possibility of typing error is there for online method of data collection, therefore, a physical data collection method is highly recommended. Several gaps also have been identified and suggested in the respective discussion sections which is highly recommended for future researchers to look into.

Next, as mention in the limitation part, most of the respondent are Chinese races. Since Malaysia is a multi-racial country, the researchers should include also all the races as equally as possible in the study. The correlation between

rates and awareness and knowledge of breathing exercise as COVID-19 management can be determine.

Other than that, the sample of the population could be expanded to include a variety of students for better representation of the overall population. The research can include a larger population for example among other university students to obtain more accurate data. The awareness and knowledge of breathing exercise as COVID-19 management can be compared between different university and students population.

Lastly, the response rate of the participants is an issue that could be overcome with frequent reminders to the participants. Besides, researcher can do some lucky draw or provide some free gift for the participants to attract their attention and interest to involve in the study.

By applying the suggestion, it would help in the future study by ensure the validity and reliability of the result. Besides, the researchers are able to obtain enough respond rate and unnecessary mistake also able to avoid during the research study.

## 5.5 Conclusion

In conclusion, most of the participants are in the category of poor awareness and poor knowledge of breathing exercise as COVID-19 management. This may due to

most of them are non health science and lack of opportunity to know about breathing exercise. However, there are still moderate amount of students with moderate awareness and knowledge regarding this topic. In short, the awareness and knowledge of breathing exercise as COVID-19 management need to be improve among the UTAR students.

COVID-19 is a severe disease that would affect human respiratory system and bring many side effects. Breathing exercise is a very good technique that can be used as the management of COVID-19 during pre or post covid rehabilitation period. Therefore, it is essential to have awareness and knowledge regarding breathing exercises during this COVID-19 period. Breathing exercise is beneficial to us and easy to apply in daily life, thus it is very convenient and suggested to every aged group of people.

Through this research, it can improve the awareness and knowledge among the people who do not know breathing exercise. This research provide a good chance for the people to expose in this topics. Future studies in this area are highly recommended as this is beneficial for every individual.

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## APPENDIX A – ETHICAL APPROVAL FORM



**UNIVERSITI TUNKU ABDUL RAHMAN**  
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/224/2022

4 November 2022

Mr Muhammad Noh Zulfikri Bin Mohd Jamali  
Head, Department of Physiotherapy  
M. Kandiah Faculty of Medicine and Health Sciences  
Universiti Tunku Abdul Rahman  
Jalan Sungai Long  
Bandar Sungai Long  
43000 Kajang, Selangor

Dear Mr Muhammad Noh,

### **Ethical Approval For Research Project/Protocol**

We refer to your application for ethical approval for your students' research project from Bachelor of Physiotherapy (Honours) programme enrolled in course UMF3026. We are pleased to inform you that the application has been approved under Expedited Review.

The details of the research projects are as follows:

No	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	Knowledge and Attitude Towards Overweight and Obesity Among Physiotherapy and Medical Students: A Cross-Sectional Study	Ching Yung Shan	Mr Muhammad Noh Zulfikri Bin Mohd Jamali	
2.	Effects of Different Gluteal Strengthening Programs on Strength, Pain, Functional Disability and Balance Among University Students with Non-specific Chronic Low Back Pain: A Randomized Controlled Trial	Lee Kah Yi		
3.	Effects on Menstrual Cycle on Dynamic Balance	Lee Chai Heng		



No	Research Title	Student's Name	Supervisor's Name	Approval Validity
10.	Comparison of Immediate Effect of Soft Tissue Manipulation (STM) and Ice Massage in Mechanical Neck Pain	Wong Hui Lin	Ms Kamala a/p Krishnan	4 November 2022 – 3 November 2023
11.	Association Between Forward Head Posture and Screening Programme of Scoliosis Among UTAR Undergraduate Students	Wong Shi Yi		
12.	Prevalence of Low Back Pain and Its Association with Ergonomic Usage Among UTAR Students	Ian Lee Haorong	Ms Swapneela Jacob	
13.	Awareness, Knowledge and Attitude Towards Artificial Intelligence in Learning Among Faculty of Medicine and Health Science (FMHS) Students in UTAR	Hwang Ji Yen	Co-Supervisor: Mr Tarun Amalnerkar	
14.	Awareness & Knowledge of Breathing Exercise as Covid-19 Management Among UTAR Students	Low Wai Kit	Ms Meneka Naidu a/p Mohnaraju	
15.	Awareness on the Adverse Effects of Vaping on Health Among UTAR Students	Lim Yu Hui		
16.	Awareness Towards Bell's Palsy Among University Students	Pong Jia Shan		
17.	The Impact of Ocular Exercises on Headache Symptoms and Sleep Quality Among University Students with Refractive Error	Pea Wan Theng	Ms Kiruthika Selvakumar	
18.	A Study to Analyze the Impact of Balance Exercise Improving Hand to Eye Coordination Among University Students in Selangor	Ong Wesley		
19.	Prevalence of Adolescent Migraine in Malaysia and The Common Triggers for It: A Cross-Sectional Study	Ong Chuu Chyi		
20.	Correlation Between Carrying Angle of Elbow and Upper Limb Flexibility Among Basketball Players	Gienisha a/p Thanapalan	Ms Siti Hazirah Binti Samsuri	
21.	Correlation Between Lower Limb Alignment and Patellofemoral Pain Syndrome Among Badminton Players in UTAR	Hee Ziyu		
22.	Effectiveness of Mindfulness Meditation on Blood Pressure and Resting Heart Rate Among Pre-Hypertensive Young Adults	Toh Jen Min	Mr Imtiaz Ali Mir	
23.	Comparison of Combined Effect of Aerobic Exercise Training and DASH Diet with DASH Diet Alone on Blood Pressure and Resting Heart Rate Among Physically Inactive Pre-Hypertensive Young Adults	Toh Xue Ying		
24.	Effectiveness of Continuous Moderate-Intensity Training and Mindfulness Meditation on Blood Pressure and Resting Heart Rate Among Physically Inactive Pre-Hypertensive Young Adults	Wan Cai Hui		
25.	Comparison between Inclined Treadmill Sprint Training and Plyometric Exercise in Improving Sprint Performance Among Healthy Young Adults	Jasmine Song WenHui	Ms Premala a/p Krishnan	

40.	Physiotherapy Students	Ian Eng Jing	Mr Avanianban Chakkarapani
41.	Awareness Towards Tourette Syndrome Among Health Science and Non-health Science Students in A Private University, Malaysia	Tan Kai Xuan	
42.	Effect of Scapular Retraction Exercise on Forward Head Posture Among University Students	Tay Kai Wei	Ms Mahadevi A/P Muthurethina Barathi
43.	Comparison Between Effect of Lower Limb Cyclic Stretching and Ballistic Stretching on Jumping Distance Among Undergraduate Students: A Comparative Study	Ng Zi Ru	
44.	Relationship of Physical Activity with Anxiety and Depression Among University Students	Ong Aiwei	Pn Nur Aqiliriana Binti Zainuddin
45.	Gender Discrepancy and Its Association with Shoulder Pain Among Malaysian Recreational Badminton Players	Khoo Je-Yique	
46.	Obesity, Eating Habits and Physical Activity Before and During Covid-19 Pandemic Among University Lecturers	Khoo Tze Sean	

The conduct of this research is subject to the following:

- (1) The participants' informed consent be obtained prior to the commencement of the research;
- (2) Confidentiality of participants' personal data must be maintained; and
- (3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.
- (4) Written consent be obtained from the institution(s)/company(ies) in which the physical or/and online survey will be carried out, prior to the commencement of the research.

**Kampar Campus** : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia  
**Tel:** (605) 468 8888 **Fax:** (605) 466 1313  
**Sungai Long Campus** : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia  
**Tel:** (603) 9086 0288 **Fax:** (603) 9019 8868  
**Website:** www.utar.edu.my



Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,



**Professor Ts Dr Faiz bin Abd Rahman**  
Chairman  
UTAR Scientific and Ethical Review Committee

c.c Dean, M. Kandiah Faculty of Medicine and Health Sciences  
Director, Institute of Postgraduate Studies and Research

## APPENDIX B – INFORMED CONSENT FORM

# Awareness and Knowledge of Breathing Exercises as COVID-19 Management Among UTAR students

Dear participants,

You are invited to participate in a research study conducted by Loh Wai Kit, from Bachelor of Physiotherapy (Hons), Universiti Tunku Abdul Rahman (UTAR), Sungai Long Campus. The aim of this research study is to determine the awareness and knowledge of breathing exercises for COVID-19 management among UTAR students.

### **Purpose of the Research Study**

The purpose of this study is to determine the awareness and knowledge of breathing exercises for covid-19 management among UTAR students.

Before you proceed to the questionnaire, please make sure you fulfil these criteria:

1. UTAR students
2. Able to understand English.
3. Never seek from advice from healthcare provider regarding breathing exercise

### **Procedures**

If you agree to be in this study, you will be asked to answer all the questionnaire provided.

The questionnaires consists 3 parts :

**Procedures**

If you agree to be in this study, you will be asked to answer all the questionnaire provided.

The questionnaires consists 3 parts :

- (a) to collect the demographic data
- (b) to assess awareness of breathing exercises as COVID-19 management
- (c) to assess knowledge of breathing exercises as COVID-19 management

**Length of Participation**

The questionnaire takes about 5 to 10 minutes to complete

**Risks and Benefits**

There are no risks or benefits from being in this study.

**Confidentiality**

No information that will make it possible to identify you, will be included in any reports to the University or in any publications.

Research records will be stored securely and only approved researchers will have access to the records.

**Voluntary Nature of the Study**

Participation in this study is voluntary. If you withdraw or decline participation, you will not be penalized or lose benefits or services unrelated to the study. If you decide to participate, you may decline to answer any question and may choose to withdraw at any time.

### Voluntary Nature of the Study

Participation in this study is voluntary. If you withdraw or decline participation, you will not be penalized or lose benefits or services unrelated to the study. If you decide to participate, you may decline to answer any question and may choose to withdraw at any time.

### Contacts and Questions

If you have any questions, clarifications, concerns or complaints, about the research, the researcher conducting this study can be contacted at 012-6109322 or [waikitloh1231utar.my@1utar.my](mailto:waikitloh1231utar.my@1utar.my)

 waikitloh12@gmail.com (not shared) [Switch account](#) 

\* Required

### Today's Date \*

Date



### Consent form \*

- I have been notified by you and that I hereby understand, consent and agreed per UTAR above notice.
- I disagree, I do not consent to this study.

## APPENDIX C – PERSONAL DATA PROTECTION NOTICE

### Personal Data Protection Statement

#### Personal Data Protection Statement

Please be informed that in accordance with Personal Data Protection Act 2010 (“PDPA”) which came into force on 15 November 2013, Universiti Tunku Abdul Rahman (“UTAR”) is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

#### Notice:

1. The purposes for which your personal data may be used are inclusive but not limited to:-

- For assessment of any application to UTAR
- For processing any benefits and services
- For communication purposes
- For advertorial and news
- For general administration and record purposes
- For enhancing the value of education
- For educational and related purposes consequential to UTAR
- For the purpose of our corporate governance
- For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/study loan

2. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

3. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

4. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to

- For educational and related purposes consequential to UTAR
- For the purpose of our corporate governance
- For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/study loan

2. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

3. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

4. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

**PDPA Statement \***

- I have been notified by you and that I hereby understand, consent and agreed per UTAR above notice.
- I disagree, my personal data will not be processed.

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## APPENDIX D – KERCJIE AND MORGAN (1980) TABLE

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

**APPENDIX E – QUESTIONNAIRE FORM (DEMOGRAPHICS)**

**Section A: Demographic data**

Name

Your answer \_\_\_\_\_

Age

- <18
- 18 - 20
- 21 - 23
- 24 - 25
- >25

Gender

- Male
- Female

Campus

### Campus

- Sungai Long
- Kampar

### Faculty

- M. Kandiah Faculty of Medicine and Health Sciences (MK FMHS)
- Lee Kong Chian Faculty of Engineering and Science (LKC FES)
- Faculty of Accountancy and Management (FAM)
- Faculty of Creative Industries (FCI)
- Faculty of Engineering and Green Technology (FEGT)
- Faculty of Information and Communication Technology (FICT)
- Faculty of Science (FSc)
- Faculty of Business and Finance (FBF)
- Faculty of Arts and Social Science (FAS)
- Institute of Chinese Studies (ICS)
- Other: \_\_\_\_\_

Institute of Chinese Studies (ICS)

Other: \_\_\_\_\_

Programme of study

Eg. Bachelor of Physiotherapy (Hons)

Your answer \_\_\_\_\_

Year of study

Year 1

Year 2

Year 3

Year 4

Other: \_\_\_\_\_

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Have you heard of breathing exercise? \*

- Yes
- No
- I don't know

Which breathing exercise have you heard before? (Multiple choice) \*

- Deep breathing
- Diaphragmatic breathing
- Thoracic expansion exercise
- Pursed lip breathing
- Square breathing
- Huffing
- Coughing
- Apical breathing
- Paradoxical breathing
- Incentive spirometry
- I don't know
- Other: \_\_\_\_\_

Where did you heard about breathing exercise? (Multiple choice) \*

Health care worker

Family/Friends

Social media/Internet

TV/Radio

Book/Magazines

Newspapers

None of above

Other: \_\_\_\_\_

Have you performed any breathing exercise? \*

Yes

No

I don't know

Have you been taught to perform any breathing exercise? \*  
(Skip next question if answer 'no' or 'I don't know')

Yes

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- Family/Friends
- Social media/Internet
- TV/Radio
- Book/Magazines
- Newspapers
- None of above
- Other: \_\_\_\_\_

Have you performed any breathing exercise? \*

- Yes
- No
- I don't know

Have you been taught to perform any breathing exercise? \*  
(Skip next question if answer 'no' or 'I don't know')

- Yes
- No
- I don't know

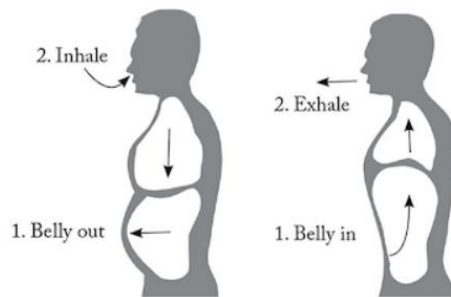
## APPENDIX F – PICTURES OF BREATHING EXERCISES

The following examples briefly explained some of the breathing technique

Deep breathing



Diaphragmatic breathing



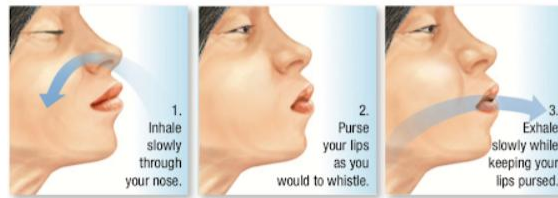


Thoracic expansion exercise (breath in against the pressure provided)



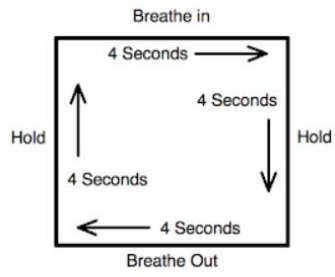
Pursed lip breathing

*Pursed-lip breathing technique*



**Note:** Do not force your lungs to empty completely.

### Square breathing



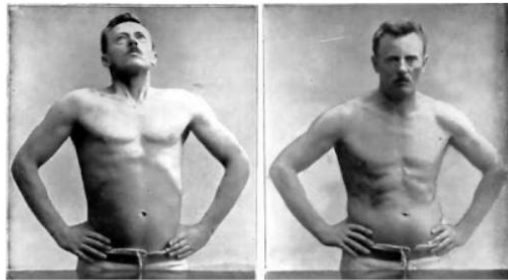
### Huffing



Coughing



Apical breathing (during breath in more focus on upper chest expansion)



Paradoxical breathing (stomach moving inward during breath in)



## APPENDIX G – AWARENESS OF BREATHING EXERCISE

\* Required

Questions about effects of COVID-19.

Based on what you think, which of the following are the effects of COVID-19? \*  
(Multiple choice)

- Shortness of breath/difficulty in breathing
- Phlegm/secretion production
- Reduced air entry to lungs
- Damage of lungs
- Fatigue
- Anxiety
- Severe cough
- Increase blood pressure
- Increase blood pH
- Reduce oxygen level
- I don't know
- Other: \_\_\_\_\_

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\* Required

Questions about effects of breathing exercise.

Based on what you think, which of the following are the effects of breathing exercise? (Multiple choice) \*

- Reduce shortness of breath/difficulty in breathing
- Clear phlegm/secretion
- Increase air entry to lungs
- Increase lung volume/lung compliance
- Reduce fatigue
- Reduce anxiety
- Training of respiratory muscle (eg; diaphragm, intercostal muscle, etc.)
- Increase oxygen intake
- Reduce blood pressure
- Reduce blood pH
- I don't know
- Other: \_\_\_\_\_

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## APPENDIX H – KNOWLEDGE OF BREATHING EXERCISE

Section C: Knowledge of breathing exercise as COVID-19 management

Based on what you think, which of the following breathing techniques helps to relieve the symptom of shortness of breath/difficulty in breathing among covid-19 positive patients? (Multiple choice) \*

- Deep breathing
- Diaphragmatic breathing
- Thoracic expansion exercise
- Pursed lip breathing
- Square breathing
- Huffing
- Coughing
- Apical breathing
- Paradoxical breathing
- Incentive spirometry
- I don't know

Based on what you think, which of the following breathing techniques helps to clear phlegm/secretion among covid-19 positive patients? (Multiple choice) \*

- Deep breathing
- Diaphragmatic breathing
- Thoracic expansion exercise
- Pursed lip breathing
- Square breathing
- Huffing
- Coughing
- Apical breathing
- Paradoxical breathing
- Incentive spirometry
- I don't know

Based on what you think, which of the following breathing techniques helps in anxiety management/provide relaxation among-19 positive patients? (Multiple choice) \*

- Deep breathing
- Diaphragmatic breathing
- Thoracic expansion exercise
- Pursed lip breathing
- Square breathing
- Huffing
- Coughing
- Apical breathing
- Paradoxical breathing
- Incentive spirometry
- I don't know

Based on what you think, which of the following breathing techniques helps in increasing the air entry to lungs among covid-19 positive patients? (Multiple choice) \*

- Deep breathing
- Diaphragmatic breathing
- Thoracic expansion exercise
- Pursed lip breathing
- Square breathing
- Huffing
- Coughing
- Apical breathing
- Paradoxical breathing
- Incentive spirometry
- I don't know

Based on what you think, which of the following breathing techniques helps in respiratory muscles training among covid-19 positive patients? (Multiple choice) \*

- Deep breathing
- Diaphragmatic breathing
- Thoracic expansion exercise
- Pursed lip breathing
- Square breathing
- Huffing
- Coughing
- Apical breathing
- Paradoxical breathing
- Incentive spirometry
- I don't know

Based on what you think, which of the following breathing techniques helps in improving lung volume among covid-19 positive patients? (Multiple choice) \*

- Deep breathing
- Diaphragmatic breathing
- Thoracic expansion exercise
- Pursed lip breathing
- Square breathing
- Huffing
- Coughing
- Apical breathing
- Paradoxical breathing
- Incentive spirometry
- I don't know



Based on what you think, which of the following breathing techniques helps to reduce fatigue among covid-19 positive patients? (Multiple choice) \*

- Deep breathing
- Diaphragmatic breathing
- Thoracic expansion exercise
- Pursed lip breathing
- Square breathing
- Huffing
- Coughing
- Apical breathing
- Paradoxical breathing
- Incentive spirometry
- I don't know

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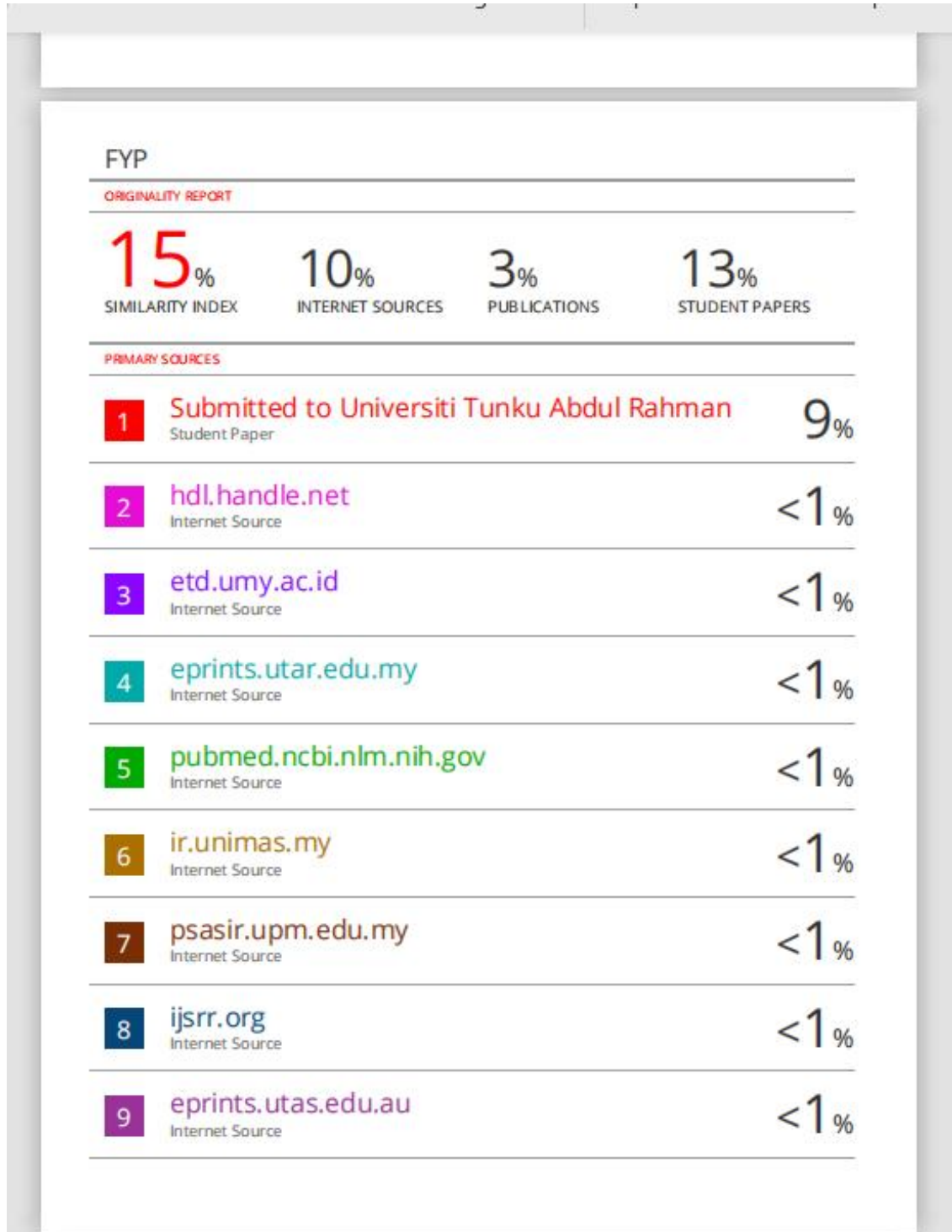
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