



(RESEARCH ARTICLE)



Improving public knowledge about mental health and fulfilling nutrition through health Webinar

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World Journal of Advanced Research and Reviews, 2022, 13(01), 379–390

Publication history: Received on 07 December 2021; revised on 09 January 2022; accepted on 11 January 2022

Article DOI: <https://doi.org/10.30574/wjarr.2022.13.1.0029>

Abstract

The Covid-19 pandemic has caused various problems, one of which is mental health problems. Unmaintained mental health can cause a decrease in the immune system and can facilitate the transmission of Covid-19. One way to increase immunity is to eat a balanced diet containing the healthy nutrients. Therefore, it is necessary to educate the public to maintain mental health and increase immunity through the fulfillment of nutrition to reduce the spread of the Covid-19 virus. Evaluation were conducted at the beginning and at the end in the form of a quiz. Then the quiz results were analyzed descriptively and comparatively using the Wilcoxon method. 228 participants who took part in webinar activities with subtopics on mental health experienced an increase in knowledge from before participating in this activity with a percentage of 46.7%, and 234 participants experienced an increase in knowledge from before participating in the webinar activity with a subtopic of increasing body immunity through nutritional fulfillment with a percentage of 47.9%. The Wilcoxon test showed that there was a significant increase in knowledge about mental health and body immunity before and after attending the webinar ($p = 0.000$). The result is there are an increase in public knowledge after the webinar is conducted. We hope that community can maintain mental health and be able to meet nutritional needs to increase immunity during the Covid-19 pandemic.

Keywords: Covid-19; Mental Health; Nutrition; Webinar; Public Education

1. Introduction

The Covid-19 virus has been around since the end of December 2019, the virus that has emerged for more than 2 years is spreading rapidly and has caused a large-scale pandemic to attack the whole world. On March 11, 2020, WHO (World Health Organization) declared the outbreak caused by Covid-19 a pandemic [1]. This virus have been considered as he most consequential global health crisis since the era of the influenza pandemic of 1918 [2]. The emergence of this virus in the current generation has had a huge impact on the order of people's lives and caused changes in lifestyle, behavior, and changes in the way people interact with each other. There are various industries and sectors which is affected by this virus such as pharmaceuticals indusry, toursim, service, travel, and other industry [3]. An unprecedented epidemic where truly effective vaccine or therapy to prevent or treat this disease has yet to be discovered is causing so many problems at the community level. This causes the need for behavioral changes to prevent transmission such as using masks, self-isolation, and maintaining distance to reduce the spread of the Covid-19 virus [4].

The ongoing pandemic that does not stop has caused various problems to arise in the community, one of which is mental problems. Mental health problems are very vulnerable to occur in the pandemic era due to changes in almost all aspects

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of life in terms of economy, education, transportation and health. There are so many challenges faced in this pandemic era that can cause excessive stress on all levels of society. The implementation of health protocols that are useful for reducing the spread of Covid-19 actually makes people feel isolated and lonely, thereby increasing anxiety or stress. Stress can cause so many feelings, such as anger, worry, sadness, frustration, difficulty concentrating and decreased immunity [5]. The COVID-19 pandemic is associated with highly significant levels of psychological distress that, in many cases, would meet the threshold for clinical relevance. Mitigating the hazardous effects of COVID-19 on mental health is an international public health priority [6].

Not maintaining mental health during the pandemic will make the body's immune decrease, making it easier for the transmission of the Covid-19 virus. Therefore, in addition to maintaining mental health, efforts are also needed to increase the body's immune in various ways. By keeping the body's immunity at an optimal level, we can reduce the possibility of contracting the Covid-19 virus [7]. Improving the body's immune is one of the important things, especially at a time when body movement is very limited due to the running of health protocols. Nutrients are very important for immune cells in responding to pathogens so that cells can produce cytokines and antibodies. There are many enzymes in immune cells that require micronutrients such as zinc, vitamins A, B6, C, and E to maintain an optimal immune response. So that in order to increase the body's immunity, it is necessary to have a healthy diet and contain the necessary nutrients in an effort to reduce the transmission of Covid-19 [8]. The effects of vitamins C, D, E, zinc, selenium and omega-3 fatty acids on the immune system and the possible benefits for people with COVID 19 are presented. They are especially relevant vulnerable elderly population [9].

The Covid-19 pandemic will continue to affect the delivery of knowledge to all level of education. Although many people will likely compensate for this interruption, some others will struggle. Therefore it is needed a way to educate the general public in this pandemic era [10]. With the rise of mental problems that emerged during the pandemic and the need to increase the body's immunity, it is necessary to carry out educational activities in the community as an effort to increase public knowledge to maintain mental health and maintain immunity by maintaining daily nutrition. One of the educational methods that can be used is through health webinars, namely by delivering educational materials using online media such as Zoom Meetings or Youtube where people can pay attention from anywhere using the gadgets they have. The advantages of online webinars are that they are easy to reach the public, easy to monitor and low operational costs. Then research will be conducted to determine whether there is an increase in public understanding of the material that has been presented in the webinar. Through this webinar, we hope to increase public understanding after participating in the webinar that have been carried out, especially related to mental health and nutrition fulfillment in the era of the covid-19 pandemic.

2. Material and methods

This study used a pre-experimental research design with pre-test and post-test group design in one group, namely web seminar or webinar. The post-test is for looking at changes in participants' understanding of preventing the impact of the Covid-19 pandemic on mental health and immunity, after giving education at the webinar. The webinar was held online for 3 hours, with two health topics, namely "Building Resilience during the COVID-19 Crisis" and "The Role of Nutrition and Lifestyle in Optimizing the Body's Immunity to Fight COVID-19".

The study population was the general public who attended the webinar. The sample was selected by using purposive sampling technique in determining the respondents. The total number of respondents was 488 people. The criteria for respondents are people who joined the webinar until it's over and fill out plus submit both pre-test and post-test.

The dependent variable was the changes in participants' understanding of preventing the impact of the Covid-19 pandemic on mental health and immunity. Then there is a control variable it was the quizzes that are made the same for all participants. Meanwhile, the independent variable in this study was the provision of education with the webinar in 2 topics: "Building Resilience during the COVID-19 Crisis" and "The Role of Nutrition and Lifestyle in Optimizing the Body's Immunity to Fight COVID-19".

This research was conducted in Zoom Meeting with respondents from all the participants of the webinar, held on 4th July 2021. The instruments used in this study were pre-test and post-test quizzes for participants of the webinar. Each quiz consisting of 12 multiple-choice questions divided into two topics, namely the topic of "Building Resilience during the COVID-19 Crisis" and "The Role of Nutrition and Lifestyle in Optimizing the Body's Immunity to Fight COVID-19", that each of which consists of 6 questions.

The data collection began with a pre-test and post-test quiz validation test, then quizzes are given to participants before and after giving education using webinar media. After that, the respondents were taken from those who matched the

inclusion criteria. Furthermore, there were analyzing data before and after education, testing differences in participants' understanding changes in the respondent group, and examining the relationship between the webinar and the participants' understanding of preventing the impact of the Covid-19 pandemic on mental health and immunity. Data processing begins with editing, coding, cleaning data, tabulating data, and analyzing data using Microsoft Excel and SPSS programs. The data were analyzed using descriptive method to find the distribution and frequency, then analyzed with the Wilcoxon signed-rank test to determine the level of understanding before and after being given treatment. The results of descriptive statistical analysis are used to determine the effect of the webinar program on increasing the general public's understanding of the impact of the Covid-19 pandemic on mental health and body immunity.

3. Results and discussion

Based on the results of the pre-test and post-test evaluations that were conducted before and after the webinar, it was found that the webinar participants experienced an increased understanding of mental health and body immunity. The following are the results of the pre-test and post-test analysis regarding mental health.

Table 1 Analysis of the Frequency Distribution of Mental Health Pre-Test and Post-Test Answers

No	Question	Frequency of Correct Answers				Frequency of Wrong Answers			
		Pre-Test	%	Post-Test	%	Pre-Test	%	Post-Test	%
1	Loss of interest and excitement, having trouble sleeping, feeling useless, reduced concentration and self-esteem are characteristics of	293	60.04	336	68.85	195	39.96	152	31.15
2	Often worry excessively, difficulty concentrating, often restless, sometimes like to sweat and shortness of breath are characteristics of	333	68.24	378	77.46	155	31.76	110	22.54
3	Not being able to stay away or avoid the desired activity or thing and not being able to stop using or doing something are characteristics of	327	67.01	363	74.39	161	32.99	125	25.61
4	The following statements are facts about mental health	214	43.85	251	51.43	274	56.15	237	48.57
5	The following are treatments for mental health problems, except	435	89.14	452	92.62	53	10.86	36	7.38
6	Changes in the behavior of individuals experiencing stress are as follows, except	401	82.17	424	86.89	87	17.83	64	13.11

In terms of mental health, as many as 488 participants attended the webinar and filled out the pre-test and post-test. From the results of the pre-test, the first question was answered correctly by 293 participants, the second question was answered correctly by 333 participants, and the third question was answered correctly by 327 participants. A total of 39.96% incorrect answers from 488 participants for the first question, 31.76% incorrect answers for the second question, and 32.99% incorrect answers for the third question. The first, second, and third questions are questions that discuss the characteristics of this type of mental health. In the post-test, the first question was answered correctly by 336 participants, the second question was answered correctly by 378 participants, and the third question was answered correctly by 363 participants. Meanwhile, in the first question, 31.15% incorrect answers were obtained from 488 participants, 22.54% incorrect answers for the second question, and 25.61% incorrect answers for the third question.

This shows that there is an increase in the understanding of webinar participants about the types of mental health and being able to distinguish between these types.

The fourth, fifth, and sixth questions are questions that discuss facts related to mental health, how to treat mental health, and the characteristics of changes in behavior of individuals who experience stress. From the results of the pre-test and post-test, 214 participants and 251 participants got the correct answer to the fourth question. The fifth question was answered correctly by 435 participants and 452 participants. The sixth question was answered correctly by 401 participants and 424 participants. While in the fourth question, the percentage of incorrect answers was 56.15% and 48.57% from 488 participants. The fifth question was not answered correctly by the participants with a percentage of 10.86% and 7.38%. The sixth question was not answered correctly by the participants with a percentage of 17.83% and 13.11%. With this it can be concluded that there is an increase in the knowledge of webinar participants about mental health facts, how to treat mental health, and the characteristics of changes in behavior of individuals who experience stress after receiving education related to mental health in the form of a webinar.

Based on the Wilcoxon test, the following results were obtained.

Table 2 Wilcoxon Ranks Test Results on Mental Health Pre-Test and Post-Test

		N	Mean Rank	Sum of Ranks
ScorePostTestMental - ScorePreTestMental	Negative Ranks	75	123.07	9230.00
	Positive Ranks	228	161.52	36826.00
	Ties	185		
	Total	488		

Table 3 Percentage of Differences in Mental Health Pre-Test and Post-Test Scores

Changes in Mental Health Pre-Test and Post-Test Scores	Total	Percentage (%)
Decrease	75	15.4
Increase	228	46.7
Constantly	185	37.9
Total	488	100

Based on the Wilcoxon test results listed in table 2, negative ranks were obtained for 75 participants with a percentage of 15.4% (table 3). Negative ranks indicates that the participants' post-test results are lower than their pre-test scores. While the positive ranks indicate that the participants' post-test scores are higher than their pre-test scores. So it was found that 228 participants who took part in webinar activities with subtopics on mental health experienced an increase in knowledge from before participating webinar with a percentage of 46.7%. In addition, the ties value of 185 was also obtained, indicating that there was no change in the value of the pre-test and post-test that had been done. It can be concluded that the 185 participants got the same score between their pre-test and post-test with a percentage of 37.9%. This increase in value can be caused by increasing public awareness of a problem and ultimately positively influencing the general public's interpretation of mental health [11].

Table 4 Wilcoxon Test Statistics Table

	Differences in pre-test and post-test scores
Z	-9.266
Asymp. Sig. (2-tailed)	0.000

Based on the output of statistical test data on the Wilcoxon test contained in table 4, it is known that the value of Asymp.Sig. (2-tailed) of 0.000. The p-value of 0.000 is smaller than 0.01 which can be interpreted as a difference in the scores on the pre-test and post-test of participants and means that there is an increase in participants' knowledge between before and after the webinar activity with subtopics on mental health. This result is supported by a systematic review study and a meta-analysis on the effectiveness of webinars which found that learning through webinars for higher education students and professionals has better effectiveness than asynchronous online learning and offline learning methods [12].

Table 5 Mental Health Pre-Test Score Frequency Distribution Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	2.5	2.5	2.5
	1	23	4.7	4.7	7.2
	2	71	14.5	14.5	21.7
	3	103	21.1	21.1	42.8
	4	105	21.5	21.5	64.3
	5	111	22.7	22.7	87.1
	6	63	12.9	12.9	100.0
	Total	488	100.0	100.0	

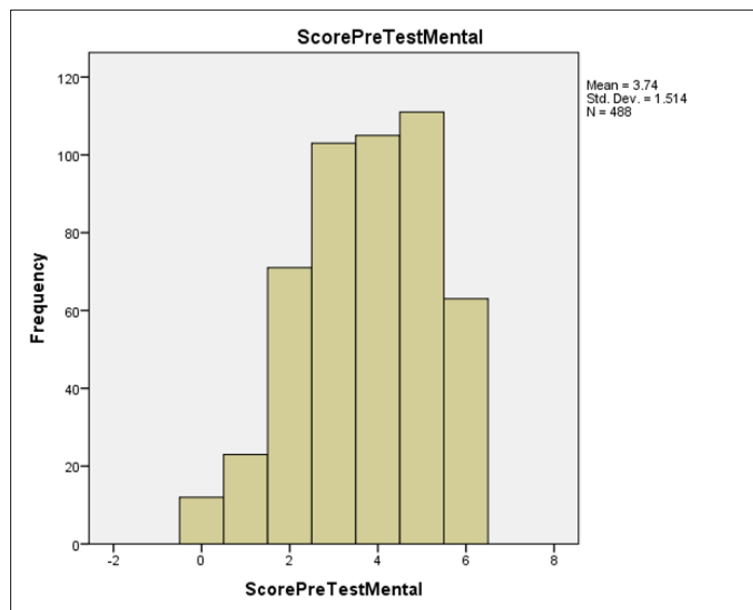


Figure 1 Mental Health Pre-Test Score Frequency Distribution Chart

Based on Table 5 and Figure 1, the number of participants with pre-test scores with the highest mental health topic was 5 out of 6 questions, which was 111 participants. After conducting education in the form of a webinar, based on table 6 and Figure 2, it was found that the number of participants with a post-test score with the highest mental health topic was a score of 5 out of 6 questions, which was 150 participants.

Table 6 Mental Health Post-Test Score Frequency Distribution Table

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	4	.8	.8	.8
	1	22	4.5	4.5	5.3
	2	33	6.8	6.8	12.1
	3	60	12.3	12.3	24.4
	4	98	20.1	20.1	44.5
	5	150	30.7	30.7	75.2
	6	121	24.8	24.8	100.0
Total		488	100.0	100.0	

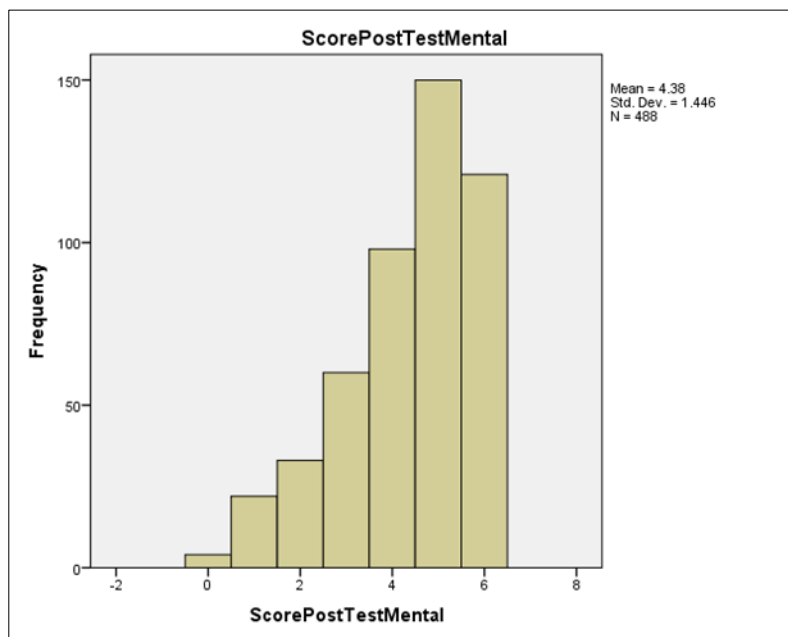


Figure 2 Mental Health Post-Test Score Frequency Distribution Chart

Table 7 Table of Average Mental Health Pre-Test and Post-Test Scores

Average	
Mental Health Pre-Test	Mental Health Post-Test
3.74	4.38

Based on table 7, it can be seen that there was an increase in the average pre-test score towards the post-test score, where the average pre-test score was 3.74 and the post-test score average was 4.38.

The following is a pre-test and post-test analysis regarding increasing body immunity through the fulfillment of balanced nutrition during the pandemic.

Table 8 Analysis of the Frequency Distribution of Answers Regarding the Body's Immunity

No	Question	Frequency of Correct Answers				Frequency of Wrong Answers			
		Pre-Test	%	Post-Test	%	Pre-Test	%	Post-Test	%
1	Which statement is not correct regarding the impact of a sedentary lifestyle	300	61.48	340	69.67	188	38.52	148	30.33
2	Excessive consumption of sodium (salt) can cause high blood pressure, increasing the risk of heart disease and stroke. There are several ways that can be done to reduce salt consumption, namely	237	48.57	260	53.07	251	51.43	228	46.93
3	Diseases that may arise as a result of a sedentary lifestyle are, except	96	19.67	88	18.03	392	80.33	400	81.97
4	The right way to avoid the risks of a sedentary lifestyle, especially the risk of weight gain/obesity, is	181	37.09	218	44.67	307	62.91	270	55.33
5	Vitamin D cannot be found in food	213	43.65	237	48.57	275	56.35	251	51.43
6	Nutrients that play the most important role in increasing and maintaining the body's immune system are:	432	88.52	442	90.57	56	11.48	46	9.43

In the matter of increasing body immunity through the fulfillment of balanced nutrition, as many as 488 participants received material exposure through webinars and filled out pre-test and post-test. From question number one, 300 participants got the correct answer and 340 participants. While the percentage of incorrect answers were obtained at 38.52% and 30.33%. This shows that there is an increase in the understanding of webinar participants regarding the impact of sedentary life. In the second question, 237 participants got the correct answer for the pre-test and 260 participants got the correct answer for the post-test. As for the percentage of incorrect answers for the pre-test and post-test on the second question, namely 51.43% and 46.93%, respectively. So it can be concluded that participants experienced an increased understanding of several ways that can be done to reduce salt consumption, so as to reduce the risk of heart disease and stroke.

Furthermore, in the pre-test and post-test the third question was answered correctly by 96 participants and 88 participants. The percentage of incorrect answers obtained was 80.33% and 81.97% for the third question. This shows the need for further education of participants about diseases that may arise as a result of adopting a sedentary lifestyle.

In the fourth question, 181 participants got the correct answer for the pre-test and 218 participants for the post-test. The percentage of incorrect answers obtained as much as 62.91% and 55.33% for the pre-test and post-test. So it can be concluded that there is an increase in the understanding of webinar participants regarding the right way to avoid the risks of a sedentary lifestyle, especially the risk of weight gain/obesity.

The fifth question was answered correctly by 213 participants for the pre-test and 237 participants for the post-test. The percentage of incorrect answers obtained as much as 56.35% and 51.43% for the pre-test and post-test. This shows that there is an increase in the knowledge of the webinar participants about some foods that contain vitamin D. While in the sixth question the correct answers to the pre-test and post-test questions were 432 participants and 442 participants with the percentage of incorrect answers being 11.48% and 9.43% which indicates that there is an increase

in participants' knowledge regarding several nutrients that play an important role in increasing and maintaining the body's immunity.

Based on the Wilcoxon test, the following results were obtained.

Table 9 Wilcoxon Ranks Test Results on Pre-Test and Post-Test Body Immunity

		N	Mean Rank	Sum of Ranks
ScorePostTestImun - ScorePreTestImun	Negative Ranks	74	122.30	9050.00
	Positive Ranks	234	164.68	38536.00
	Ties	180		
	Total	488		

Table 10 Percentage of Differences in Pre-Test and Post-Test Scores of Body Immunity

Changes in Body Immunity Pre-Test and Post-Test Scores	Total	Percentage (%)
Decrease	74	15.2
Increase	234	47.9
Constantly	180	36.9
Total	488	100

Based on the Wilcoxon test results listed in table 9, negative ranks were obtained for 74 participants with a percentage of 15.2% (table 10). Furthermore, it was found that 234 participants experienced an increase in knowledge from before participating in the webinar activity with a subtopic of increasing body immunity through nutritional fulfillment with a percentage of 47.9%. In addition, the ties value of 180 was also obtained with a percentage of 36.9% which means that there is no change in the value of the pre-test and post-test that has been done. It can be concluded that the 180 participants got the same score between the pre-test and post-test.

Table 11 Wilcoxon Test Statistics Table

		Differences in Pre-Test and Post-Test Scores
Z		-9.722
Asymp. Sig. (2-tailed)		.000

Based on the output of statistical test data in the Wilcoxon test contained in table 11, it is known that the value of Asymp.Sig. (2-tailed) of 0.000. The value of 0.000 is smaller than 0.05 which can be interpreted that there is a difference in the scores in the pre-test and post-test of the participants and means that there is an increase in participants' knowledge between before and after the webinar activity with the subtopic of increasing body immunity through nutritional fulfillment during the pandemic Covid-19.

Table 12 Frequency Distribution Table of Body Immunity Pre-Test Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	2.5	2.5	2.5
	1	50	10.2	10.2	12.7
	2	104	21.3	21.3	34.0

	3	130	26.6	26.6	60.7
	4	119	24.4	24.4	85.0
	5	64	13.1	13.1	98.2
	6	9	1.8	1.8	100.0
	Total	488	100.0	100.0	

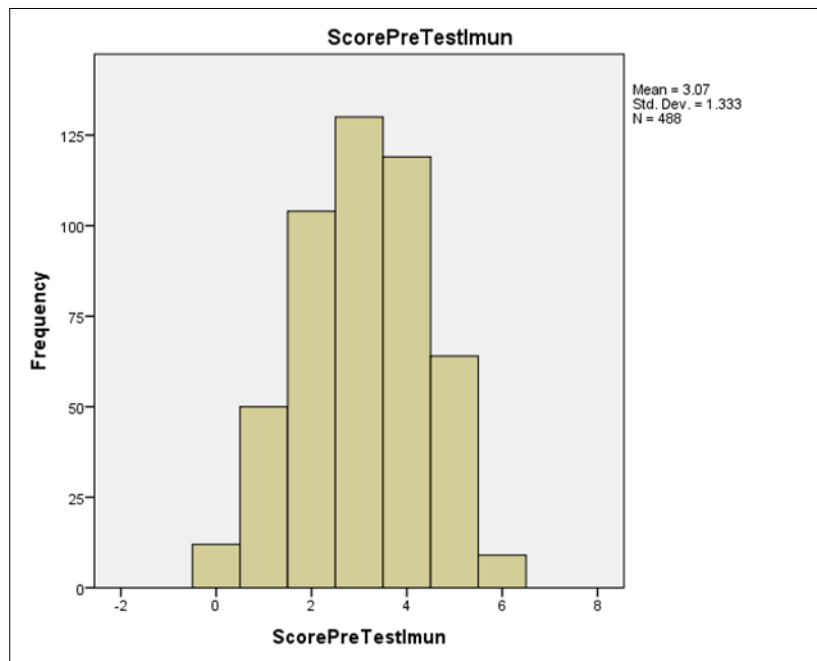


Figure 3 Frequency Distribution Chart of Body Immunity Pre-Test Scores

Table 13 Frequency Distribution Table of Post-Test Body Immunity Score

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	11	2.3	2.3	2.3
	1	29	5.9	5.9	8.2
	2	69	14.1	14.1	22.3
	3	101	20.7	20.7	43.0
	4	111	22.7	22.7	65.8
	5	114	23.4	23.4	89.1
	6	53	10.9	10.9	100.0
	Total	488	100.0	100.0	

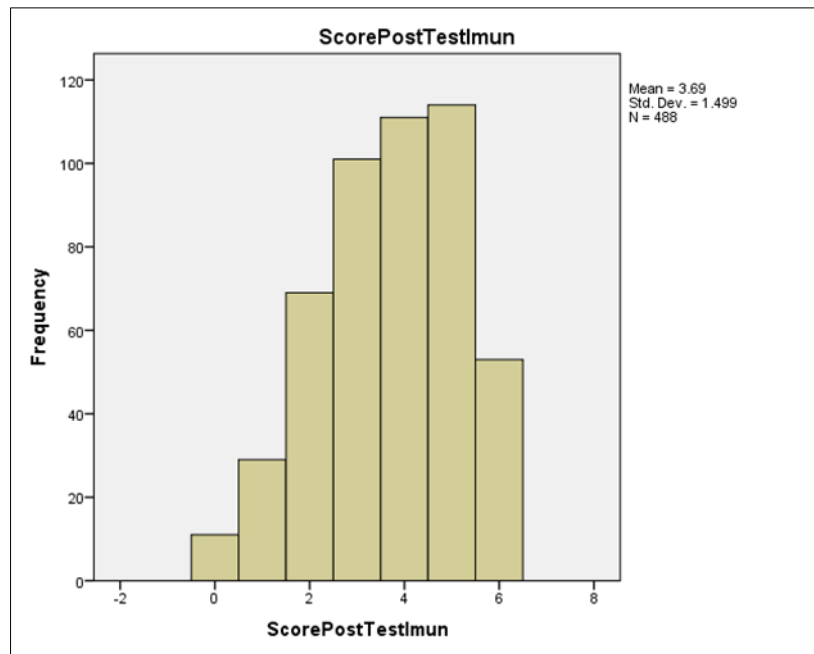


Figure 4 Frequency Distribution Chart of Post-Test Body Immunity Scores

Based on Table 12 and Figure 3, it was found that the number of participants with pre-test scores with the highest immunity topic was 3, which was 130 participants. After education through webinars, based on table 13 and Figure 4, it was found that the number of students with post-test scores with the highest immunity topic was a score of 5, which was 114 participants.

Table 14 Table of Average Body Immunity Pre-Test and Post-Test Scores

Average	
Body Immunity Pre-Test	Body Immunity Post-Test
3.07	3.69

Based on table 14, it can be seen that there was an increase in the average pre-test score towards the post-test score, where the average pre-test score was 3.07 and the post-test average score was 3.69.

Based on the results of the pre-test and post-test during the activity, this webinar gave several results, namely increasing knowledge and understanding of webinar participants on the importance of mental health during the COVID-19 pandemic and increasing knowledge and understanding of webinar participants on the importance of maintaining body immunity during the COVID-19 pandemic. This is supported by a study conducted in China which compared the levels of third-level medical students' knowledge of diabetes management in hospital after attend interactive seminars directly. The level of knowledge is measured through a questionnaire immediately before and immediately after the end of the seminar. There is a significant difference knowledge of seminar participants after participating in seminar activities (p value < 0.01) [13]. Research conducted similar to what was done in Malaysia for ordinary people who attended seminars on cancer cervix where there was a significant increase in knowledge after participants attended the seminar (p value < 0.001) [14]. Organizing personal and professional development activities through webinars offers many advantages, namely easier access, learning resources that are tailored to the needs and can be reused, can be followed by participants in peripheral and rural areas, and save costs and time, especially for traveling [15].

The webinar activities conducted online went well and smoothly. This webinar is aimed at the general public, namely by presenting material carried out by resource persons, it is hoped that with this webinar the public will have additional knowledge and understanding of students about the importance of mental health and the importance of maintaining body immunity during the COVID-19 pandemic.

Based on the evaluation of its implementation, it can be identified that the supporting factors of this activity so that it can run well and smoothly are webinar activities that are carried out online, making it easier to promote, reduce budget costs, and are able to reach participants from all regions in Indonesia. While the inhibiting factor of this activity is technical constraints such as the sudden loss of the internet network that affects the time of the webinar activity.

4. Conclusion

The Webinar which is held online for the general public is effective in increasing public understanding of the importance of mental health and body immunity through fulfilling nutrition, especially during the current COVID-19 pandemic.

With the implementation of this webinar, there is an increase in knowledge about mental health and immunity building, this is evidenced by an increase in the value of the pre-test and post-test evaluations showing that public knowledge is increasing. Education for all groups and ages is still very much needed to improve the quality of mental health and body immunity through fulfilling nutrition during the COVID-19 pandemic throughout Indonesia.

The limitation of this study is that it did not consider the demographics of the survey participants, such as gender, age, place of residence, and education level that might influence the pre-test and post-test results.

Compliance with ethical standards

Acknowledgments

We thanked dr. Hafid Algristian, Sp.KJ as the presenter on the topic “Building Resilience in the Middle of the COVID-19 Crisis”, Dr. Widati Fatmaningrum, dr., M.Kes., Sp.GK as the presenter on the topic “The Role of Nutrition & Lifestyle in Optimizing Body Immunity for Fighting COVID-19”, and all participants who have attended and participated in our webinar and research.

Disclosure of conflict of interest

There are no conflicts of interest to be disclosed by any of the Authors regarding this research.

Statement of informed consent

Informed consent was received from all individual participants included in the study.

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