



Research Paper

Knowledge Level of Vaccine Officers on Storage and Distribution of Covid-19 Vaccine in Hospitals

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ABSTRACT: Improper storage and distribution of vaccines can lead to compromised vaccine quality. The knowledge of vaccine officers regarding vaccine storage and distribution is important to maintain good vaccine quality. This study aims to study the level of knowledge of vaccine officers in terms of storage and distribution of Covid-19 vaccines at three hospitals in the city of Padang, namely tertiary referral hospital X hospital, Regional hospital Y, and Private hospital Z. This research is descriptive quantitative, data collection using a validated questionnaire containing 30 questions about storage and 15 questions about vaccine distribution with 4 answer options provided. The study was conducted from November 2022 to January 2023 on 41 vaccine workers who had vaccine training certificates. Of the 41 respondents in this study, 20 people were used to test the validity of the questionnaire and 21 people as research respondents. The results showed that the highest level of knowledge of respondents regarding the storage of covid-19 vaccines in the three hospitals was in the good category (47.62%), while the highest level of knowledge of respondents regarding the distribution of covid-19 vaccines was in the sufficient category (38.10%). There needs to be a broader role for pharmacists in educating vaccine storage and distribution issues in hospitals.

KEYWORDS: knowledge level, vaccines, hospital, storage and distribution.

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I. INTRODUCTION

At the end of 2019, precisely in December, the world was shocked by an event that made many people nervous, namely known as the corona virus (covid-19). This outbreak has been designated as a global health emergency, because this virus has hampered human daily activities. Quarantine alone is not enough to prevent this infectious disease [1] Infectious diseases can be defined as diseases caused by pathogens or their toxic products, which arise through transmission from infected people, infected animals, or contaminated inanimate objects to susceptible hosts. Infectious diseases are not only caused by fungi, bacteria or parasites, but also caused by viruses [2]. Viruses are a large group of submicroscopic infectious agents that are usually thought of as non-living highly complex molecules, containing a protein envelope surrounding an RNA or DNA core of genetic material but lacking a semipermeable membrane, capable of growing and multiplying only in living cells and that cause a variety of important diseases in humans, animals and plants. An example in humans is *Coronavirus disease*. *Coronavirus disease* can be treated with antivirals, one of which is a vaccine. Vaccines are biological products made from germ components that have been sterilized, *attenuated* or killed which is useful for stimulating the active generation of specific immunity against disease [3].

Improper storage and distribution of vaccines can lead to deviations in vaccine quality. These deviations can result in vaccine damage, thereby reducing or even eliminating potency. Risk factors that cause deviations in vaccines are not following the correct vaccine management guideline procedures, lack of knowledge of officers, the function of refrigerators that are not specialized in storing vaccines, not available temperature measuring *thermometers*, and improper way of carrying vaccines [4].

Apart from the storage and distribution process that must be considered, proper vaccine management also needs to be supported by trained and responsible officers. For this reason, according to researchers, we

must also see how the knowledge of covid-19 vaccine officers in the city of Padang by selecting three hospitals as a comparison sample for each of these hospitals on the storage and distribution of covid-19 vaccines, because according to a research article from Rahmah (2014) from Andalas University, the knowledge of officers in vaccine storage and distribution shows that of the 21 respondents, as many as 13 respondents (61.9%) have good knowledge of vaccine storage and distribution and as many as 8 respondents (38.1%) have poor knowledge [5], according to Prasetyo's research (2020) at the Sleman Regency Health Center, officer knowledge is still not good about vaccine storage and distribution [6].

II. RESEARCH METHODS

This research is a Quantitative Descriptive research , conducted at the end of November 2022 to January 2023. This research conducted at three hospitals in Padang city, namely tertiary referral hospital X hospital, Regional hospital Y, and Private hospital.Z. Data collection used a questionnaire consisting of 30 questions for storage and 15 statements for distribution of Covid-19 vaccines. Data collection using a questionnaire consisting of 30 questions for storage and 15 statements for distribution of the Covid-19 vaccine. The population in this study were all covid-19 vaccine officers in the three hospitals, as listed in table 1 below:

Table 1. Total population and research respondents

Hospital	Number of Respondents	Number of respondents for research data
Referral tertiary hospital X	16	9
Private hospital.Z.	9	6
Regional hospital Y	16	6
Total	41	21

According to Notoadmojo (2012)[7], the sample is part of the object studied in number and characteristics and represents the entire population. Respondents in this study were taken randomly with varying numbers as shown in table 1 as many as 21 people because 20 people were used to test the validity of the questionnaire. The inclusion criteria in this study were officers who had received training on vaccine storage and distribution. Data analysis was carried out descriptively by assessing the percentage of correct answers given by respondents, then calculating the percentage of correct answers given by respondents. The results of the study were categorized as good if the correct answer was 76-100%, sufficient if 56-75% and less if the correct answer was 0-55%.

III. RESULTS AND DISCUSSION

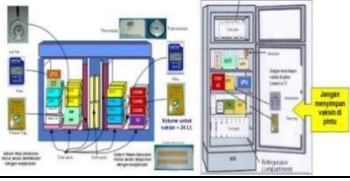

Questionnaire Validity Test

The questionnaire used in this study was distributed to respondents. The purpose of this distribution is to determine whether a question is valid or not which will be used as research material, in this study there are 30 questions about the storage of the covid-19 vaccine and 15 questions about the distribution of the covid-19 vaccine. The distribution of questionnaires was given to each hospital which was divided into 7 respondents for tertiary referral hospital X, 10 respondents for regional hospital Y and 3 respondents for private hospital Z, so that the total number of respondents from the three hospitals used as validity tests was 20 respondents. Validity and reliability tests were computerized using SPSS-26. The results obtained show that the *Cronbach's alpha* value is > 0, 044 for the number of respondents 20 people. All questionnaire items for covid-19 vaccine storage are 0, 790 and the *Cronbach's alpha* value for distribution is 0, 765. It can be concluded that these variables can be said to be reliable or consistent in measuring.



Respondent Characteristics

Characteristics of respondents based on education, the most respondents from the Department of pharmacy / pharmacist as many as 8 people (38.1%), from nursing as many as 5 people (23.8%), midwifery as many as 4 people (19%), and from other majors as many as 4 people (19%). (19,0 %). Characteristics of respondents based on age, the most respondents from 31-40 years old as many as 9 people (42.9 %), from the age of less than 30 years old as many as 6 people (28.6%), and more than 40 years old as many as 6 people (28.86%). people (28.86%)

Table 2. Distribution of respondents' answers to the storage of covid-19 vaccines

No.	Questions	Number of Respondents who answered correctly (people)
1.	Based on the procedure of storage Temperature, divided by What is covid-19 vaccine storage temperature?	15
2.	What are the types of covid -19 vaccines that are divided in three parts according to the Ministry of Health No.01.07 of 2021?	21
3.	What is Temperature Storageof the pfizer vaccine?	15
4.	Examples of stored covid-19 vaccinesat a temperature of 2°C- 8°C is	17
5.	Why does covid-19 vaccine storage have to be in accordance with Standard Operating Procedures (SPO)?	19
6.	One of the requirements for storage space The covid-19 vaccine below is	15
7.	So that the Covid-19 vaccine is not confused with routine vaccines then one of the efforts made by officers is	18
8.	For storage of covid-19 vaccines, health services use ?	15
9.	Why the stored covid-19 vaccine at temperature 2°C- 8°C not be placed close to the evaporator?	11
10.	Why can the covid-19 vaccine stored at 20°C be placed close to the evaporator?	12
11.	The picture below is an example of? 	13
12.	What is meant by Ultra Cold Chain (UCC) ?	14
13.	Vaccine type which must be placed close to the evaporator is	13
14.	The UCC vaccine transportation tool consists of 2 namely:	11
15.	UCC stand for	21
16.	Freezer-type vaccines must be stored at very low temperatures or at is called	13
17.	PCM stands for	15
18.	The picture below is one of the UCC vaccine transportation tools called 	6
19.	What is the capacity of the large size ULT Freezer?	16
20.	How many types of PCM are there?	19
21.	At location which become storage center far freezer facilities with a temperature of ?	11
22.	Tools transportation vaccine specialized (Arktek) is used for long-term storage?	14

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23.	PCM consists of 3 types, namely ULT frizeer special PCM (-80°C), CO2/Dry ice liquid (-78°C), and Water/ice (0°C).	19
24.	Officers must use PPE in the form of...	13
25.	The temperature in vaccine storage must be maintained as recommended, therefore what needs to be done is	14
26.	The picture below is the PPE of officers in the arrangement and collection of vaccines called by 	18
27.	How many times minimum Temperature monitoring in a day?	15
28.	UCC vaccine transportation tools must equipped with?	11
29.	What is a <i>datalogger</i> ?	20
30.	The picture below is a vaccine storage area called ? 	15

In table 2, it can be seen that this study has 2 categories, namely correct and incorrect answers. This study uses a *Guttman* scale with a score if correct 1 and if incorrect 0 to analyze questions about the storage of covid-19 vaccines in the form of multiple choice. From question 1 it can be seen that the covid-19 vaccine officers who answered correctly were 15 people (0, 714%) and officers who answered incorrectly were 6 people (0, 285%) of the total number of officers. This shows that most officers already know the procedure/management of covid-19 vaccine storage which is in accordance with the decision of the minister of health of the republic of Indonesia No. HK. 01.07 of 2021.

In question no. 2, it can be seen that all covid-19 vaccine officers, namely 21 people (100%) of the total number of officers, know what vaccines are divided into 3 parts. according to KMK 2021, the storage of covid-19 vaccines is divided into 3 temperatures, namely at a storage temperature of 2⁰ - 8⁰ C (ex: Sinovac), covid vaccine with a temperature of -20⁰ C (Moderna) and storage at a temperature of -70⁰ C (Pfizer) (Kemenkes RI, 2021).[In question no. 3, it can be seen that the covid-19 vaccine officers who answered correctly were 15 people (0.714%) and officers who answered incorrectly were 6 people (0.285%) of the total number of officers. This shows that covid-19 vaccine officers already know about the storage temperature of the Pfizer vaccine which is at -70⁰ C. The Pfizer vaccine must be stored at -70⁰ C because this mRNA vaccine uses genetic information from the virus and in making this vaccine there are also very small non-particles to be directed directly to cells. So that these very small non-particles may be dangerous and make the vaccine must be stored at a very low temperature of -70⁰ C (WHO).In question no. 4, it can be seen that the covid-19 vaccine officers who answered correctly were 17 people (0.809%) and officers who answered incorrectly were 2 people (0.095%) of the total number of officers. This shows that covid-19 vaccine officers already know vaccines that must be stored at 2⁰ C - 8⁰ C including Astrazeneca, Novavax and Sinopharm (Indonesian Ministry of Health, 2021).[3] In question no. 5, the officers who answered correctly were 19 people (0, 904%) and those who answered incorrectly were 2 people (0, 095%). This shows that vaccine officers already know that vaccine storage must be in accordance with SPO to maintain vaccine quality until it is received by the target [3].

In question no. 6 the officers who answered correctly were 15 people (0, 714%) and those who answered incorrectly were 6 people (0, 285%). This shows that covid-19 vaccine officers already know that one of the requirements for vaccine storage is that the storage room must avoid sunlight because if exposed to sunlight the vaccine will be damaged.[3] In question no. 7, the officers who answered correctly were 18 people (0, 857%) and those who answered incorrectly were 3 people (0, 142%). This shows that the covid-19 vaccine officer already knows that to avoid mixing the covid-19 vaccine with routine vaccines, it must be stored separately in accordance with the procedure [3].In question no. 8 the officers who answered correctly were 15 people (0, 714%) and those who answered incorrectly were 6 people (0, 285%). This shows that covid-19

vaccine officers already know that in storing the covid-19 vaccine for health services, officers must use a *Vaccine Refrigerator* as a storage place for the covid-19 vaccine which has a temperature of $2^{\circ}\text{C} - 8^{\circ}\text{C}$. [3] In question no. 9, the officers who answered correctly were 11 people (0, 523%) and those who answered incorrectly were 10 people (0, 476%). This shows that many covid-19 vaccine officers still do not know that vaccines at a temperature of -20°C should not be close to the evaporator because the vaccine is sensitive to heat.

While in question no. 10 the officers who answered correctly were 12 people (0, 571%) and those who answered incorrectly were 9 people (0, 428%). This shows that many covid-19 vaccine officers still do not know that vaccines at a temperature of -20°C can be placed close to the evaporator because the vaccine is sensitive to freezing [3] In question no. 11, the officers who answered correctly were 13 people (0, 619%) and those who answered incorrectly were 8 people (0, 380%). This shows that covid-19 vaccine officers know more about the images of open top and open front refrigerators compared to those who do not know [3].

In question no. 12 the officers who answered correctly were 14 people (0.666%) and those who answered incorrectly were 7 people (0.380%). This shows that the covid-19 vaccine officer knows that the meaning of *Ultra Cold Chain* is a freezer with a very low temperature. One of the benefits of UCC is that it is used for vaccines with a temperature of -70°C [3]. In question no. 13, the officers who answered correctly were 13 people (0, 619%) and those who answered incorrectly were 7 people (0, 380%). This shows that the covid-19 vaccine officer knows that one type of vaccine that can be placed close to the evaporator is Moderna, it is known that Moderna is stored at a temperature of -20°C so that this type of vaccine is sensitive to freezing [3]. In question no. 14 the officers who answered correctly were 11 people (0, 619%) and those who answered incorrectly were 10 people (0, 476%). This shows that more covid-19 vaccine officers know that UCC transportation tools are *Arktek* and *Thermoshipper*, *Arktek* itself uses a cold box in the form of Phase Change Materials while *Thermoshipper* uses dry ice [3]. In question no. 15 the officers who answered correctly were 21 people (100%) and those who answered incorrectly were 0 people (0%). This shows that the covid-19 vaccine officer as a whole knows that UCC stands for Ultra Cold Chain [3].

In question no. 16 the officers who answered correctly were 13 people (0.619%) and who answered incorrectly as many as 8 people (0, 380%). This shows that officer vaccine covid-19 vaccine officers know that Freezers must be stored at temperature is very low temperature or called Ultra Cold Chain [3]. On question question no. 17 officers who answered correctly were 15 people (0, 714%) and those who answered incorrectly were 6 people (0, 285%). answered incorrectly as many as 6 people (0, 285%). This shows that vaccine officers covid-19 PCM stands for Phase Change Materials [3]. In question no. 18 the officers who answered correctly were 6 people (0, 285%) and those who answered incorrectly were 15 people (0, 714%). This shows that many covid-19 vaccine officers do not know that the UCC means of transportation are archetypes and PCM [3] In question no. 19, the officers who answered correctly were 16 people (0, 761%) and those who answered incorrectly were 5 people (0, 238%). This shows that the covid-19 vaccine officer knows that the capacity of the ULT Freezer is 25,000 Vials [3].

In question no. 20 of the officers who answered correctly were 19 people (0, 904%) and those who answered incorrectly were 2 people (0, 095%). This shows that more covid-19 vaccine officers know that PCM consists of 3 types, namely PCM special freezer ULT- 80°C for UCC to fill the package with PCM liquid, Co_2 liquid storage at a temperature of -80° , ice water for Chold Chain [3]. In question no. 21, the officers who answered correctly were 11 people (0, 619%) and those who answered incorrectly were 10 people (0, 476%). This shows that the covid-19 vaccine officer knows that the remote storage center requires freezer facilities with a temperature of ULT -85°C Small (70 liters each) [3].

In question no. 22, the officers who answered correctly were 14 people (0.666%) and those who answered incorrectly were 7 people (0.333%). This shows that covid-19 vaccine officers know that special vaccine transportation equipment (*Arktek*) is used for short periods [3] In question no. 23, the officers who answered correctly were 19 people (0.904%) and those who answered incorrectly were 2 people (0.095%). This shows that more covid-19 vaccine officers know that PCM consists of 3 types with a ULT- 80°C freezer for UCC fill the package with PCM liquid, Co_2 liquid storage at -80° , ice water for Chold Chain [3]. In question no. 24 the officers who answered correctly were 13 people (0, 619%) and those who answered incorrectly were 8 people (0, 380%). This shows that more covid-19 vaccine officers know that officers must use PPE in the form of Cryogenic Gloves as cold and gloves [3] In question no. 25 the officers who answered correctly were 14 people (0, 666%) and those who answered incorrectly were 9 people (0, 428%). This shows that the covid-19 vaccine officer knows that the vaccine temperature must be maintained, so the temperature must be checked using a temperature monitoring device or using the Smile application [3].

In question no. 26 the officers who answered correctly were 18 people (0, 857%) and those who answered incorrectly were 3 people (0, 142%). This shows that the covid-19 vaccine officer knows the picture, where the picture shows an officer using PPE in the form of Cryogenic Gloves when taking the covid-19 vaccine [3] In question no. 27, the officers who answered correctly were 15 people (0, 714%) and those who answered

incorrectly were 6 people (0, 285%). This shows that more covid-19 vaccine officers know that temperature monitoring in a day is more than 2 times a day [3]. In question no. 28 the officers who answered correctly were 11 people (0, 619%) and those who answered incorrectly were 10 people (0, 476%). This shows that covid-19 vaccine officers know more that UCC vaccine transportation equipment must be equipped with a *datalogger* to record data from time to time [3] In question no. 29, the officers who answered correctly were 20 people (0, 952%) and those who answered incorrectly were 1 person (0, 047%). This shows that more covid-19 vaccine officers know that a *dattalogger* is a data *logger*.a data recorder to record data over time [3].

In question no. 30 the officers who answered correctly were 15 people (0, 714%) and those who answered incorrectly were 6 people (0, 285%). This shows that more covid-19 vaccine officers know that officers know the vaccine storage area in the picture is called a *vaccine carrier* which functions to carry vaccines in smaller quantities than cold boxes, making it easier to carry [3].

Table 3 Level of Knowledge of Officers on the Storage of Covid-19 Vaccines

No.	Category	Score Range	Frequency	Percentage
1.	Good	76 - 100	10	47,62%
2.	Simply	56 - 75	5	23,81%
3.	Less	0 - 55	6	28,57%
Total			21	100%

Based on the table 3 above, it can be explained that of all 21 respondents, officers from 3 hospitals sampled in Padang city have a level of knowledge of the storage of covid-19 vaccines in the good category, namely 47.62% with a frequency of 10, 23.81% with a frequency of 5, while less is in the percentage of 28.57% with a frequency of 5.6. This shows that the level of knowledge of officers regarding vaccine storage is in a good category, but it can be seen that the percentage of the less category is more than the percentage of the sufficient category so that This shows that the level of knowledge of officers about the storage of covid-19 vaccines is still a lot that does not understand.

Table 4. Distribution of respondents' answers to covid-19 vaccine distribution

No.	Question	Number of Respondents who answered correctly (people)
1.	The distribution of covid-19 vaccines and supporting equipment must be properly managed in accordance with the procedure. set for?	13
2.	Distribution of covid-19 vaccines must be accompanied by?	14
3.	When do the arrangement mandatory vaccine using?	8
4.	Flow distributors stage the initial distribution flow is	17
5.	Where Distribution can be done?	9
6.	When doing distribution, the vaccine is stored in?	8
7.	Mechanism distribution of the vaccine depends on?	17
8.	The implementation of the distribution of the covid-19 vaccine can be carried out through the assignment of ?	5
9.	The implementation of the distribution of the covid-19 vaccine can be carried out through the assignment of ?	12
10.	Where does PT Biofarma ship to?	12
11.	When the vaccine arrives at the HUB, what does the vaccine officer do?	8
12.	If there are discrepancies in the quality and quantity of vaccines at the time of handover at the health service facility, what does the vaccine officer do?	17
13.	The cold chain of vaccines is ?	10

14.	What should be considered when receiving the covid-19 vaccine?	15
15.	Infection measures are performed on cold box	15

In question no. 1 for the distribution of the covid-19 vaccine, it can be seen that there are 13 officers who answered correctly (0, 619%) and 8 officers who answered incorrectly ((0, 380%). In this case it can be seen that the covid-19 vaccine officer knows more about vaccine management must be in accordance with the specified standards so that the vaccine is not damaged so as to ensure good vaccine quality to the target [3]. In question no. 2, it can be seen that 14 officers answered correctly (0, 666%) and 7 officers who answered incorrectly ((0, 333%). In this case, it can be seen that covid-19 vaccine officers know more about the distribution of vaccines must be accompanied by SBBK (Proof of Goods Out so as not to be misused [3]. In question no. 3, it can be seen that 8 officers answered correctly (0, 380%) and 13 officers who answered incorrectly ((0, 619%). In this case it can be seen that few covid-19 vaccine officers know about the arrangement of vaccines must use PPE clothing so that the vaccine is not contaminated by foreign objects that will expose the vaccine to these objects [3]. In question no. 4, it can be seen that 17 officers answered correctly (0, 809%) and 4 officers who answered incorrectly ((0, 190%). In this case, it can be seen that covid-19 vaccine officers know more about the flow of distribution of the initial stage through the ministry of health, then certain business entities distribute to the provincial health office, then to the city health office so that it reaches the health service unit [3].

In question no. 5, it can be seen that 9 officers answered correctly (0, 428%) and 12 officers who answered incorrectly ((0, 571%). In this case, it can be seen that the covid-19 vaccine officer does not know about the distribution of vaccines by the port health office or the port health office. In question no. 6, it can be seen that 8 officers answered correctly (0, 380%) and 13 officers who answered incorrectly ((0, 619%). In this case, it can be seen that the covid-19 vaccine officer does not know about the storage of vaccines in the Cold room and vaccine refrigerator by the type of covid-19 vaccine when distributed [3]. In question no. 7, it can be seen that there are 17 officers who answered correctly (0, 809%) and 4 officers who answered incorrectly ((0, 190%). In this case it can be seen that covid-19 vaccine officers know more about the vaccine mechanism depending on policies from the central government and the availability of the state budget [3]. In question no. 8, it can be seen that 5 officers answered correctly (0, 238%) and 16 officers who answered incorrectly ((0, 761%). In this case it can be seen that the covid-19 vaccine officer does not know about the distribution of vaccines through the assignment of the ministry of health [3]. In question no. 9, it can be seen that 12 officers answered correctly (0, 571%) and 9 officers who answered incorrectly ((0, 428%). In this case, it can be seen that the covid-19 vaccine officer knows about PBF, which is a company in the form of a legal entity that has a license to procure, store, distribute drugs or medicinal materials in large quantities [3].

In question no. 11, it can be seen that 8 officers answered correctly (0, 380%) and 13 officers who answered incorrectly ((0, 619%). In this case it can be seen that the covid-19 vaccine officer does not know whether or not the officer scans the 2D Matrix on the shipping document [3]. In question no. 12, it can be seen that there are 17 officers who answered correctly (0, 809%) and 4 officers who answered incorrectly ((0, 190%). In this case it can be seen that the covid-19 vaccine officer knows that when there is a mismatch during the handover of the vaccine, he can return the goods to the Hub / Distributor with the procedures specified [3]. In question no. 13, it can be seen that the officers who answered correctly were 10 people (0.476%) and 11 officers who answered incorrectly ((0.523%). In this case it can be seen that the covid-19 vaccine officer does not know enough about the cold chain which is an activity from the beginning of vaccine manufacture, until the vaccine is used to maintain vaccine temperature [3]. In question no. 14, it can be seen that there are 15 officers who answered correctly (0, 714%) and 6 officers who answered incorrectly ((0, 285%). In this case it can be seen that the covid-19 vaccine officer knows that when receiving a vaccine the officer must pay attention to the ED (Expired) and VVM conditions [3]. In question no. 15, it can be seen that the officers who answered correctly were 15 people (0.714%) and 6 officers answered incorrectly ((0.285%). In this case, it can be seen that the covid-19 vaccine officer knows about disinfection measures on the surface of the Cold Box to avoid microorganisms [3].

Table 5. Knowledge level of officers on Covid-19 Vaccine Distribution

No.	Category	Score Range	Frequency	Percentage
1.	Good	76 - 100	7	33,33%
2.	Simply	56 - 75	8	38,10%
3.	Less	55 - 0	6	28,57%
Total			21	100%

Based on the table above, it can be explained that out of a total of 21 respondents, officers from 3 hospitals sampled in Padang city have a level of knowledge of the distribution of covid-19 vaccines in the good category with a percentage of 33.33% with 7 respondents, enough with a percentage of 38.10% with 8 respondents, while less with a percentage of 28.57% with 6 respondents. This shows that the level of knowledge of officers from 3 hospitals in Padang city is in the moderate range. So the average of the overall level of knowledge of vaccine officers in Padang city shows the results of 70.42% of a total of 21 respondents. At the overall level of knowledge of officers, the level of knowledge of the storage of covid-19 vaccines in the good category is 10 people, 5 people are sufficient while 6 people are lacking. Then at the level of knowledge of the distribution of the covid-19 vaccine, 7 respondents were in the good category, 8 people were sufficient while 6 people were lacking.

So that from the two tables of categories of knowledge level percentage results that researchers have obtained, it can be compared with a journal entitled the level of knowledge of medical record officers at Sinar Husni Hospital Medan. In 2016. Based on the results of research from Zulhan Andi Ritonga on the Level of Officer Knowledge of the storage system in the RSU, most of the respondents were in the category of good knowledge level as many as 3 people with a percentage of 60% while less good as many as 2 people with a percentage of 40% with a total sample of 5 people [9]. Meanwhile, Prasetyo et al's research with the title Level of Knowledge of Vaccine Management Officers and Evaluation of Vaccine Management at the Sleman Regency Health Center in 2021 said that the results of the research that had been obtained about the level of knowledge of officers, namely with a total sample of 27 people, obtained results with an average of 73, 58%. [6].

Increasing knowledge about the storage and distribution of the Covid-19 vaccine is an effort to maintain vaccine quality, but prevention of covid-19 infection is much more necessary, as stated by Siregar (2008) that health efforts are organized with a maintenance approach, health promotion (promotive), disease prevention (preventive), disease healing (curative) and health recovery (rehabilitative), which are carried out in a comprehensive, integrated and sustainable manner (Siregar, 2008)[10]. Corona virus infection or COVID-19 cannot be treated, but there are several steps that can be taken to relieve symptoms and prevent the spread of the virus [11], including increasing the knowledge of vaccine officers so that the quality of the covid-19 vaccine is maintained.

IV. CONCLUSIONS

The results showed that the knowledge level of most respondents the storage of the covid-19 vaccine in the three hospitals was in the good category (47.62%), while the highest level of knowledge of respondents regarding the distribution of the covid-19 vaccine was in the sufficient category (38.10%).

REFERENCES

- [1] Putri, R. (2020). Indonesia Dalam Menghadapi Pandemi Covid-19 : *Jurnal Ilmiah Universitas Batanghari Jambi*, 20(2),1-5 .
- [2] Seventer, Van. & Hochberg, S. (2017). Principles of Infectious Diseases: *International Encyclopedia Of Public Health*. 6(2), 1-19.
- [3] Kemenkes RI. (2021). Peraturan Kementerian Kesehatan HK. 01.07 Tahun 2021 Terhadap Penyimpanan dan Distribusi Vaksin Covid-19. Jakarta: Kementerian Kesehatan Republik Indonesia.
- [4] Kemenkes RI. (2017). Kementerian Kesehatan Republik Indonesia. Penyelenggaraan Imunisasi. Jakarta: Kementerian Kesehatan Republik Indonesia.
- [5] Rahmah, dkk. (2015). Hubungan Karakteristik dan Tingkat Pengetahuan Petugas Imunisasi Terhadap Praktik Penyimpanan dan Transportasi Vaksin Imunisasi di Tingkat Puskesmas Kota Padang Tahun 2014: *Jurnal Kesehatan Andalas*,4(3), 1-8.
- [6] Prasetyo, dkk. (2020). Tingkat Pengetahuan Petugas Pengelola Vaksin dan Evaluasi Pengelolaan vaksin di Puskesmas Kabupaten Sleman: *Majalah Farmaseutik*, 17(2), 1- 7.
- [7] Notoatmodjo, S. (2012). *Metode Penelitian Kesehatan*. Jakarta: Rineka Cipta.
- [8] Sugiyono. (2016) *Metode penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: PT Alfabeta.
- [9] Ritonga. (2016). Tingkat Pengetahuan Petugas Rekam Medis Tentang Sistem Penyimpanan Berkas Rekam Medis di Rumah Sakit Umum Sinar Husni Medan: *Jurnal Ilmiah Perekam dan Informasi Kesehatan Imelda*, 1(2), 1-9.
- [10] Siregar CJP . (2008). *Farmasi Rumah Sakit Teori dan Penerapan*. Jakarta: Penerbit Buku Kedokteran Egc.
- [11] Indasah, I. M. (2020). *Epidemiologi Penyakit Menular*. Kediri: Strada Press.