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SURVIVAL ANALYSIS OF PATIENT HEALING IN MENTAL DISORDERS USING KAPLAN MEIER'S METHOD AND LOG-RANK TEST

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ABSTRACT

A mental disorder is a mental dysfunction that can interfere with everyday activities. Based on the characteristics of the area of the City of Medan there are problems with mental disorders, the high number of ODGJ cases is very dangerous for society. To this end, a survival analysis of the ODGJ patient's lifespan time was carried out at the Karsa Medan Soul Hospital with the Kaplan-Meier test as a calculation of the estimate of the healing time and the Log-Rank test to test the differences in the survival function of the treatment time of ODGJ patients. The conclusion of the test results obtained with the help of the R Studio software program version 2022.02.1+461 was that the survival function curve in ODGJ patients had an estimate of survival functions at ODGJ from a 2-day recovery time with a value of 0.99759 to 92 days with the value of 0,00000. Based on the results of the Log-Rank test with $\alpha = 0.05$, obtained the test results for gender is $4.40 > 3.84$, then rejected H_0, so there is a significant difference, and the results of survival estimation on the first day of male survival opportunities of 0.9931 (99.31%) are greater than women, namely 0.9919 (99. 19%), so that male patients recover longer than female patients; then the result of the Age-based Log-rank test is $2.44 < 3.84$, there is no rejection H_0, so there are no significant differences, and the results of survival estimation on the first day of survival opportunities for patients aged < 40 years is 0. 992 (99.2%) is greater than the patient aged ≥ 40 years is 0.986 (98.6%), so that patients aged < 40 years recover faster than patients aged ≥ 40 years; and last Log-Rank results for comorbid and non-comorbid is $27.21 > 3.84$, there are rejections H_0, so there is a significant difference, and the results of survival estimation on the first day the survival chance of comorbid patients is 0.9961 (99.61%) greater than that of non-comorbid patients which is 0.9937 (99.37%), so that non-comorbid patients recover faster than comorbid patients.

Keywords: Survival Analysis, ODGJ, Kaplan-Meier, Kaplan-Meier Curve, Log-Rank Test

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PRELIMINARY

In everyday life, a person experiences an unwanted event. For example, in something faced as desired, then it will be fun, as well as the opposite. (Khorizi, 2022). Man is a social creature, whereas a social being in the process of interaction carried out between individuals, a particular group or community will form. Connect with others

through innovative and productive ways, because people cannot live alone and thrive without engaging in a group. The truth above concludes that being in a group is a need that must be met and felt by each individual. (Wondo, 2020). Based on the characteristics of the region in the fields several problems occur in one of them regarding ODGJ (people with mental disorders). This mental disorder has become a problem in some regions that are developing especially in the field towns. This mental disorder is caused by the impact of modernization where not everyone is ready to face the rapid changes and new technological advances. Mental disorders do not cause death directly but will cause their suffering to become unproductive and create a burden on the family and the surrounding community (Khosi'in, 2020).

Mental disorders are serious mental health problems that cause cognitive, affective, and social functional barriers so that individuals are unable to perform activities in daily life. According to Maulana *et al*., (2019), mental disorders can occur in all groups ranging from children, teens, and adults, to the elderly. Currently, the prevalence of mental disorders continues to increase every year, including the Medan City. Mental disorders are characterized by a disorder in the thinking process where there is a severe disdistortion of reality/reality; the second characteristic is that a person with a mental disorder is often unable to communicate clearly because his words become chaotic and the content of the speech; and the third is the loss of control and integration of his own behavior, a formula he beats another per, son, he may feel that his hand is uncontrollable and the hand beats the person on his own or there is another power that uses his hand out of his will. (Hasanah, 2020). Thus, other characteristics of a person who has mental disorders include easy to be angry for no reason, feefeelingxious, worrying too much for two weeks in a row until disrupting daily activities, decreased productivity, and relationships with others become disrupted. (Sarfika *et al*., 2021).

Symptoms of mental disorders that threaten family members and surrounding communities, result in a material and moral burden on the family. In addition to being a family burden, clients with mental disorders can pose a burden on governments and society as productivity decreases. (Syahputra *et al*., 2021). A person's mental disorder is caused by genetic factors, such as a family history of mental disorders, brain damage, chronic diseases, and the use of illicit drugs; environmental factors such as an environment full of violence or controversy, misguiding patterns, conflict, and very difficult economic conditions; and psychological factors can be seen from an environment filled with

traumatic experiences, heavy psychological burden, closed personality, and negative self-conceptions. (Putri *et al*., 2022).

According to the WHO, there are approximately 35 million people with depression, 60 million with bipolarity, 21 million with schizophrenia, and 47.5 million with dimensional depression. The total number of people with mental disorders in Indonesia currently is 236 million people, with the category of mild mental disorder 6% of the population and 0.17% suffer from severe psychiatric disorders, 14.3% of them suffer. Approximately 6% of the population aged 15-24 years have mental disorders. Of the 34 provinces in Indonesia, North Sumatra is ranked ninth with the number of mental disorders of 18.014 people and the prevalence of schizophrenia problems in second place of 1.9 per cent. Basic Health Research (Riskesdas) data in 2018 by the Research and Development Agency of the Ministry of Health (Kemenkes) was carried out on 300,000 samples of households (1.2 million people) in 34 provinces, 416 districts, and 98 cities. From a number of health data and information, points on mental disorders reveal increases in proportions quite significant. Compared to 2013, the risk increased from 1.7 percent to 7 percent. This means that per 1,000 households there are 7 homes that have ODGJ, so the number is estimated to be around 450 thousand ODGJ heavy (Kementerian Kesehatan RI, 2020).

A study conducted by Muhajir and Palupi (2018) entitled "Survival Analysis of Children's Diarrhea Patients Using the Kaplan-Meier Method and Log Rank Test" concluded that from the results of Kaplan–Meier's survival curve analysis, it was found that male patients had the longest chance of recovery compared to female patients and patients aged 6-11 had longer chances of recovering compared with 5 years of age. For the Log Rank test, it was found that there were no significant differences between the cumulative chances of survival based on the gender or age of the patient. Furthermore, another study conducted by Maulida (2019) with the title "Analysis of the lifespan of breast cancer patients using Hazrad Cox Proportional Regression and Kaplan-Meier Method" concluded that the results of Kaplan Meier's calculations obtained the probability of a breast cancer patient's survival two years period of 0.737 or 73.7%. Furthermore, a study from Ramadhani (2020) entitled "Survival Analysis in Type-2 Diabetes Patients Using Kaplan Meier Method and Log Rank Test" concluded that based on the curve and Kaplan Meier analysis results, it was obtained that the highest chance of survival was on day 1, which is of 0.96 and the lowest survival chance is on day 36, which is 0. Based on

the Log Rank test, it was found that there is a significant difference between the patient's chances of survival in other disease factors that accompany the patient and dietary factors.

Based on previous research, the research was updated by the researchers, in which the authors created research variables based on gender, age, and comorbid and non-comorbid patients. Kaplan-Meier method is one of the methods that is often used in survival analysis because this method is very suitable for use when the sample size is calculated slightly. Kaplan-Meier's method has an advantage over the life table method, which is that it can provide a definite proportion of life resistance because it uses life-resistance time accurately rather than based on interval classes. Kaplan-Meier method is capable of handling incomplete data (sensors) and is a measure of the frequency or number of people undergoing medical care. (Jawardi, 2021). According to Suhartini et al., (2018), censorship is one of the steps to take to address data in incomplete observation. In addition, the author also created a graph of the survival analysis curve with Kaplan Meier's method that explains the patient's healing rate based on the variable with the help of the R program software and compares survival functions between variables using a log log rank.

Survival analysis is associated with people with mental disorders (ODGJ) to find long-term differences in the patient's healing rate. Survival analysis or survival analysis is a statistical procedure used to describe the analysis of data related to time, the known time origin of the research already determined, the time of the existence of an event, or, the end time of research. (endpoint). The researchers used the Kaplan-Meier method. (Kleinbaum dan Klein, 2018). Kaplan Meier Method is a modification of a function that can be used to handle incomplete data. Kaplan Meier test is a statistical test used to estimate the survival function *S(t).* The Log Rank test is a test used to compare two groups related to different conditions. (Imam, 2021).

The aim of this study is to obtain an estimate of the survival function (long recovery time) of ODGJ patients using the Kaplan-Meier method as well as to know the long recovery differences of patients based on gender, age, and comorbid and non-comorbid patients using a Log-Rank test. Then the maximum method was proven with the help of R Studio software to prove the truthfulness of the Kaplan-Meier model solution.

To avoid the occurrence of misinterpretation in this study then the limitation of the problem is the data used is data from RSJ patients on the healing rate of ODGJ patients that is gender, age, positive ODGJ comorbid and non-comorbid. The focus of the study was to estimate the survival/recovery rate of ODGJ patients and look for a comparison of the healing rate between odgj patients based on gender, age, comorbid and non-comorbid

positive ODGJ using the Log-Rank test. The method used in the application of analyzing the level of life resistance is the Kaplan-Meier method.

METHODS

This study was conducted at RSJ Bina Karsa Medan, Jln. Pales III No. 19 Toughened Laminated Safety Glass. Let Let. Jan Ginting km. 9 districts of Field Tuntungan, City of Medan, North Sumatra 20135. The study was conducted from December 2022 to May 2023. Then the type of data used in this research is primary data which is data that comes from information directly from the company or related parties in the research such as interviews and direct observations by researchers. Secondary data is data that is not obtained directly from its source and is already available in a finished form that has been published such as documents and company archives. (Arikunto, 2019). While the source of data from this study is through the internal agency to know about the beginning of treatment of patients with ODGJ and what factors support the process of healing rate to the patient so that it can be known.

This research uses quantitative methods, which are research methods to test certain theories by studying the relationship between variables. Variables are usually measured with research instruments so that data consisting of numbers can be analyzed based on statistical procedures. (Kusumastuti *et al.*, 2020). The data analysis carried out in this study was data analysis using the Kaplan-Meier test and the Log-Rank test aimed at obtaining an estimate of survival function (S(t)), displaying a survival functions chart (S (t)), as well as looking for differences in healing rates based on gender, age, and positive comorbid and non-comorbid ODGJ variables. This research uses the help of R studio software. The survival function can be expressed as follows.

$$S(t) = P(T > t) = 1 - P(T \leq t) = 1 - F(t)$$

Where

S(t) = function of survival

F(t) = cumulative function of the data distribution

t = observed time

The survival function for a time interval is the proportion of the number of subjects surviving at the beginning of the interval reduced by the number of failures in that interval: $\hat{S}(t_i) = \frac{N_{i-1} - d_i}{N_{i-1}}$ (Imam, 2021).

The Kaplan-Meier Method is one of the methods in survival analysis that is used to find out how high the chances of survival of a person suffering from a particular disease are. Kaplan-Meier method calculates survival by giving a clear proportion of survival. (Sauddin *et al*., 2021). In conducting the assumption of the function of the intersection analysis using the Kaplan-Meier method, data is very needed. In practice, the data that often appear at the time of data collection is incomplete (sensor data). Usually, a life-resistance observation has an early start time of observation and a last time of observance, so that the researcher can only observe all events and record the time of events over a specified time. (Allo dan Ignatius, 2018). A log-rank test is a statistical test used to compare two or more survival functions, both in the form of a lifetime table and its graph curvature. A log-rank test is a chi-square for a large sample, which compares the frequency of observed cells with the expected for the entire category of time intervals. The log-rank test shows whether the two groups have statistically similar survival functions or not. The log-rank test has a hypothesis to know the differences in cumulative chances of survival:

- $H_0 : S_1(t) = S_2(t)$ (There is a significant difference between the two survival functions*)*
- $H_0 : S_1(t) \neq S_2(t)$ (There is no significant difference between the two survival functions*)*

With the critical area is H_0 if the P-value $<$ level of significance.

The tested zero hypotheses is H_0 : there is no difference between survival functions. The test statistics are as follows.

$$\chi^2 = \sum \frac{(\sum o_{jt} - \sum e_{jt})^2}{\sum e_{jt}}$$

A chi-square distribution with a free degree G-1; where G represents the number of comparison groups. (Imam *et al.*, 2022).

The research procedures that will be carried out in this search are as follows:

1. Merumuskan masalah.
2. Collecting data on patients with ODGJ.
3. Find information about the date of entry and date of exit of patients with ODGJ from the hospital.
4. The patient's recovery time ranges from the fastest to the longest.
5. Survival analysis with Kaplan-Meier analysis.
6. Kaplan-Meier analysis for ODGJ patients based on the male and female gender, patient age factors, and comorbid and non-comorbid positive patients with the help of R studio software.

7. Execute a Log Rank test to find a comparison between variables and survival functions.
8. To conclude.

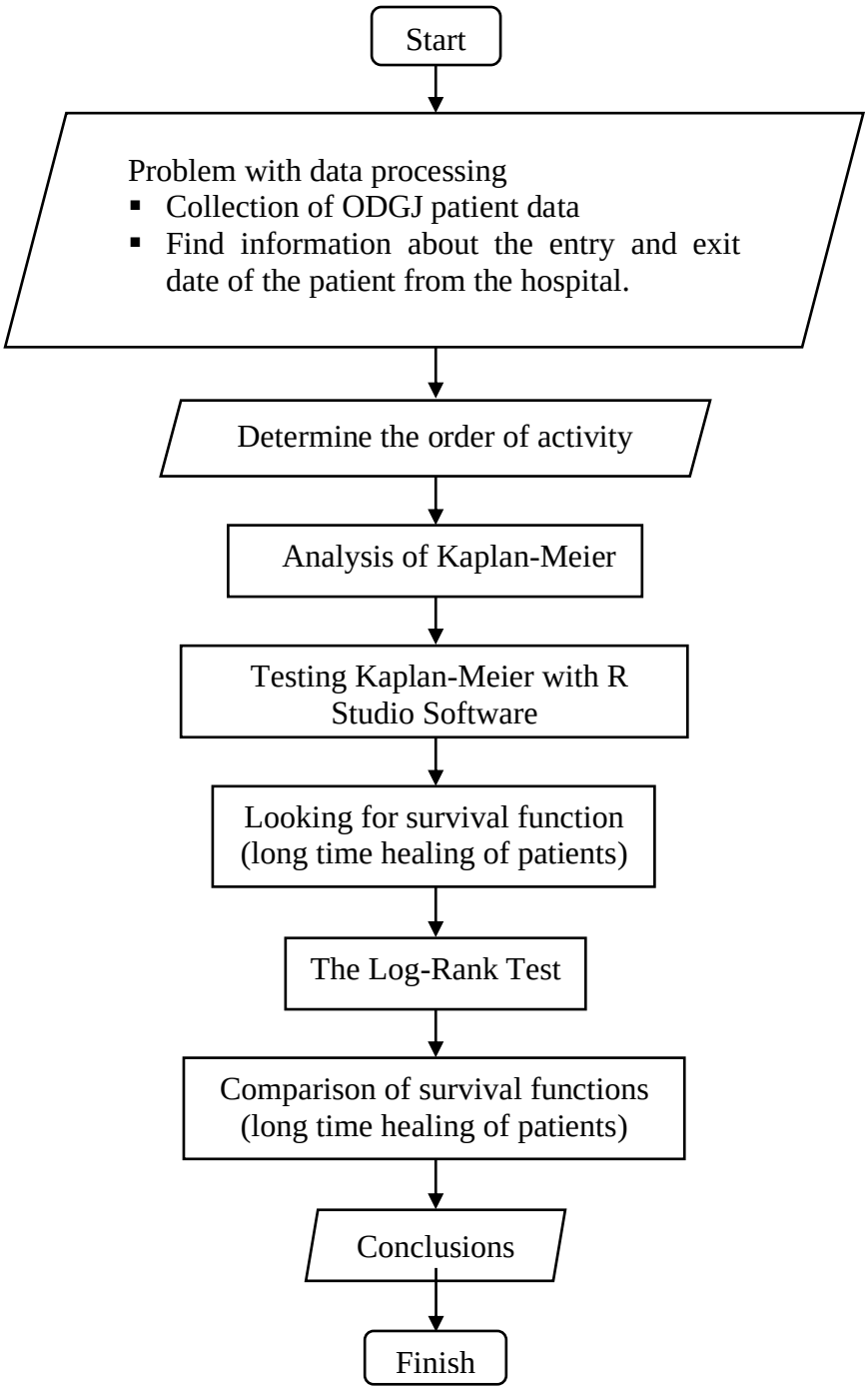

Figure 1. Diagram of Research (*flowchart*)

The variables studied in this study use two variables: the response variable and the predictor variable. The patient's healing process takes a long time. Subsequently, the factors supporting the healing rate include gender, age (years), and positive ODGJ with comorbid and non-comorbid.

Table 2. Variable Research

Variable	Symbol	Testimony
Variable Response	t	A long time of patient healing
Variable Predictor	X_1	Female
	X_2	Age (years)
	X_3	Positive ODGJ with comorbid and non-comorbid

RESULT AND DISCUSSION

In this study, the data to be analyzed is the medical record data received from the Bina Karsa Medan Hospital there are 415 samples of research patients in mental disorders that have healed status and have died status. It should be noted that of the data listed greater rates of healing compared to mortality, the study was conducted using patient data positive ODGJ to comorbid and non-comorbid ODGJ from January 2022 to December 2022 with evidence of recovery. Data processing in this study uses R program software with survival packages.

Table 3. ODGJ Patient Data Already Ranked

No	The Time (Day)	Status	No	The Time (Day)	Status	No	The Time (Day)	Status	No	The Time (Day)	Status
1	2	1	106	20	1	211	24	1	316	28	1
2	4	1	107	20	1	212	24	1	317	28	1
3	4	1	108	20	1	213	24	1	318	28	1
4	5	1	109	20	1	214	24	1	319	28	1
5	5	1	110	20	1	215	24	1	320	28	1
6	5	1	111	20	1	216	24	1	321	28	1
7	6	1	112	20	1	217	24	1	322	28	1
8	6	1	113	20	1	218	24	1	323	28	1
9	6	1	114	20	1	219	24	1	324	28	1
10	6	1	115	20	1	220	25	1	325	28	1
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
408	59	1	410	65	1	412	72	1	414	80	1
409	65	1	411	72	1	413	72	1	415	92	1

In Table 3, there are time columns that indicate that the long duration of the patient's recovery time ranges from a duration from 2 days to a period of 92 days. There is a number 1 notation on the table which has the meaning that this study focuses on recovering patients, so the meaning of the number 1 on that table is recovery.

Estimate ODGJ Patient Survival Analysis for Total Data using Kaplan-Meier Method

The step below is how to calculate manually to find function or estimate function survival/long-time healing ODGJ patients that are calculated using the formula $\hat{S}(t_i) = \frac{N_{i-1} - d_i}{N_{i-1}}$.

Table 4. Estimate of ODGJ patients using the Kaplan-Meier method

Time (Day)	#Patien	#Healed	$\hat{S}(t_i)$	$\hat{S}_{kumulatif}$
0	415	0	$\frac{415}{415}$	1
2	415	1	$\frac{414}{415}$	$\left(\frac{414}{415}\right) \times 1 = 0.99759$
4	414	2	$\frac{412}{414}$	$\left(\frac{412}{414}\right) \times 0.99759 = 0.99277$
5	412	3	$\frac{409}{412}$	$\left(\frac{409}{412}\right) \times 0.99277 = 0.98554$
6	409	4	$\frac{405}{409}$	$\left(\frac{405}{409}\right) \times 0.98554 = 0.97590$
7	405	5	$\frac{400}{405}$	$\left(\frac{400}{405}\right) \times 0.97590 = 0.96385$
8	400	9	$\frac{391}{400}$	$\left(\frac{391}{400}\right) \times 0.96385 = 0.94216$
9	391	6	$\frac{385}{391}$	$\left(\frac{385}{391}\right) \times 0.94216 = 0.92770$
10	385	5	$\frac{380}{385}$	$\left(\frac{380}{385}\right) \times 0.92770 = 0.91565$
⋮	⋮	⋮	⋮	⋮
80	2	1	$\frac{1}{2}$	$\left(\frac{1}{2}\right) \times 0.00482 = 0.00241$
92	1	1	0	$(0) \times 0.00241 = 0.00000$

Table 4 shows the long duration of patient recovery from 0 days with an estimated survival value of 1 (100%) to 92 days with a survival estimate of 0.00000, that there is a potential number of patients to recover, and there are the results of the survival function estimate used to calculate the cumulative survival functions estimate which results will be used to make a Kaplan-Meier curve. The following figure 2 is an estimated survival curve for the overall data using the Kaplan-Meier method in ODGJ patients with the R Studio Program.

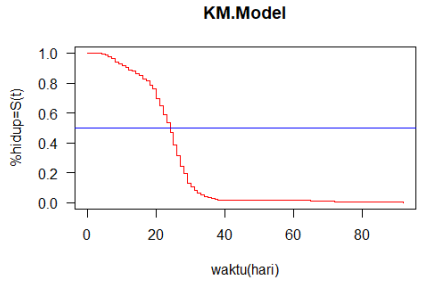

Figure 2. Estimate Kaplan-Meier Models on ODGJ Patient Data

Shown in figure 2 above shows that the estimate line (S(t)) decreases as the time (day) grows larger. This suggests that the smaller the probability value, the sooner the ODGJ patient will recover. In Figure 2 above there is a red curve line that shows the healing rate in ODGJ patients from a long duration of 2 days with a survival estimate of 0.99759 (99%) to 92 days with an estimated survival value of 0.00000. While the blue-colored line is the median of the long recovery time of the ODGJ patient is 0.5, so the ODGJ patient in the RSJ Bina Karsa Medan will quickly recover on the 92nd day with a chance value of 0.00000 (0%).

The following table 5 is an estimated survival outcome for the overall data using the Kaplan-Meier method in ODGJ patients with the R Studio Program.

Table 5. ODGJ Patient Survival Results Using R Software

time	n.risk	n.event	survival	std.err	lower 95% CI	upper 95% CI
2	415	1	0.99759	0.00241	0.99288	10.000
4	414	2	0.99277	0.00416	0.98465	10.000
5	412	3	0.98554	0.00586	0.97412	0.9971
6	409	4	0.97590	0.00753	0.96126	0.9908
7	405	5	0.96386	0.00916	0.94606	0.9820
8	400	9	0.94217	0.01146	0.91998	0.9649
9	391	6	0.92771	0.01271	0.90313	0.9530
10	385	5	0.91566	0.01364	0.88931	0.9428
11	380	5	0.90361	0.01449	0.87566	0.9325
12	375	6	0.88916	0.01541	0.85946	0.9199
13	369	3	0.88193	0.01584	0.85142	0.9135
14	366	8	0.86265	0.01690	0.83016	0.8964
15	358	4	0.85301	0.01738	0.81962	0.8878
16	354	10	0.82892	0.01849	0.79346	0.8660
17	344	6	0.81446	0.01908	0.77790	0.8527
18	338	11	0.78795	0.02007	0.74959	0.8283
19	327	11	0.76145	0.02092	0.72153	0.8036
20	316	28	0.69398	0.02262	0.65102	0.7398
21	288	19	0.64819	0.02344	0.60384	0.6958
22	269	24	0.59036	0.02414	0.54489	0.6396
23	245	23	0.53494	0.02448	0.48904	0.5851
24	222	26	0.47229	0.02451	0.42662	0.5228
25	196	36	0.38554	0.02389	0.34145	0.4353
26	160	29	0.31566	0.02282	0.27397	0.3637
27	131	31	0.24096	0.02099	0.20314	0.2858
28	100	19	0.19518	0.01946	0.16054	0.2373
29	81	26	0.13253	0.01664	0.10361	0.1695
30	55	12	0.10361	0.01496	0.07808	0.1375
31	43	8	0.08434	0.01364	0.06142	0.1158
32	35	7	0.06747	0.01231	0.04718	0.0965
33	28	7	0.05060	0.01076	0.03336	0.0768
34	21	4	0.04096	0.00973	0.02572	0.0652

time	n.risk	n.event	survival	std.err	lower 95% CI	upper 95% CI
35	17	3	0.03373	0.00886	0.02016	0.0565
36	14	2	0.02892	0.00823	0.01656	0.0505
37	12	3	0.02169	0.00715	0.01136	0.0414
38	9	1	0.01928	0.00675	0.00971	0.0383
59	8	1	0.01687	0.00632	0.00809	0.0352
65	7	2	0.01205	0.00536	0.00504	0.0288
72	5	3	0.00482	0.00340	0.00121	0.0192
80	2	1	0.00241	0.00241	0.00034	0.0171
92	1	1	0.00000	0.00000	0.00000	0.00000

The results of R software aimed at proving the solution performed using R software have the same results as the results of the solution manually. In this way, it is possible to conclude that the answers made manually are not wrong.

Patient Survival Analysis with Kaplan-Meier Method

In this study, the researchers analyzed survival/survival of ODGJ patients based on gender factors, age, and comorbid and non-comorbid ODGY patients. Here is an analysis of ODGJ patient survival for each factor.

Female

The researchers grouped the gender of ODGJ patients into two sections, namely ODGJ patients of male sex and ODGJ patients of female sex. The number of male ODGJ patients was 291 more than the number of female patients 124. Here is a graph of estimated survival of ODGJ patients based on gender using the Kaplan-Meier method with the R Studio program.

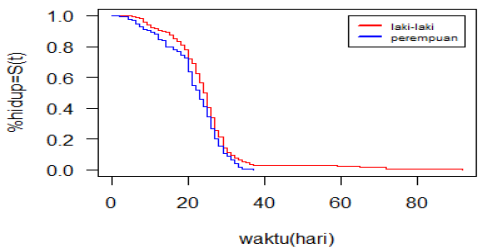

Figure 3. Cumulative Survival Estimate Based on Gender Type

As seen in Figure 3, there is a red curve line representing a line of healing rate in male patients, and a blue curve is a line that represents a curve rate in female patients. From the data available ODGJ patients have more male gender than female gender patients. The above image shows that the female gender has better chances of survival than the male because on the type graph the average female sex is always below the male. The smaller the probability value, the sooner the ODGJ patient will recover. On the first day,

the chances of male survival were 0.9931 (99.31%) greater than women's 0.9919 (99.19%), so it can be explained that in ODGJ patients males recovered longer than female patients. However, this difference is not statistically significant, so it is necessary to do it with a Log-Rank test.

Age

Based on age factors, age can gradually affect physical, mental, and social activity. The older you are, the more mature you are in physical, mental, and social activity. (Anggoniawan, 2018). In this study, the researchers grouped the age of ODGJ patients into two parts, namely < 40 year-old ODGJ patients and ≥ 40 year ODGY patients. < 40 year old ODGJ patients were 290 more than ≥ 40 year old patients were 125. Here is a graph of the estimated survival of ODGJ patients based on < 40 year old ODG J patients and ≥ 40 year ODG Y patients using the Kaplan-Meier method with the R Studio program.

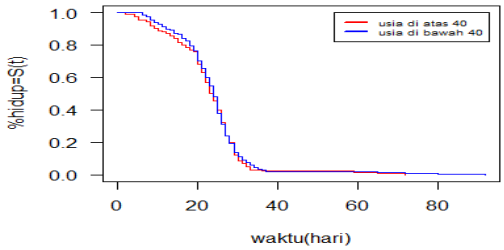

Figure 4. Estimate Cumulative Survival Based on Age

Seeing from Figure 4 shows that the red curve line represents the line of the healing rate in patients over 40 years of age and the blue curve is a line of healing rates in patients under 40. From the data available, ODGJ patients are ≥ 40 year younger than < 40 year old patients. The above image shows that $1 \geq 40$ year old ODGJ patients are better than < 40 year-old patients. On the first day, the chance of survival of ≥ 40 year-old patients was 0.992 (99.2%) greater than that of < 40 year-old ODGJ patients, which was 0.986 (98.6%), so it can be explained that in < 40 year old patients it was quicker to recover than in ≥ 40 year old patients. However, this difference is not statistically significant, so it is necessary to do it with a Log-Rank test.

Comorbid and Non-Comorbid Patients

The researchers grouped ODGJ patients based on comorbid and non-comorbid. The number of ODGJ patients with comorbidities was 256 more than the number of non-comorbid ODGJ patients was 159 (38%). Here is a graph of estimated ODGJ patient survival based on comorbid and non-comorbid using the Kaplan-Meier method with the R Studio program.

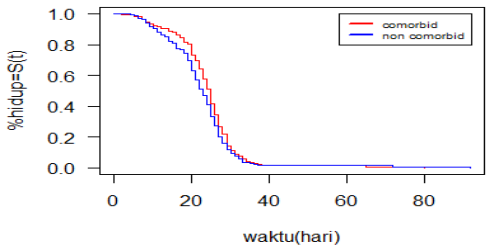

Figure 5. Estimate Cumulative Survival Based on Comorbid And Non-Comorbid

Figure 5 shows that the red curve line represents the line of the healing rate in ODGJ-positive patients with a comorbid and the blue curve lines are the lines of the recovery rate in non-comorbid patients. From the data available, ODGJ patients are more comorbid than non-comorbid patients. The above image shows that comorbid ODGJ patients are better than non-comorbid ODGJ patients. On the first day, the chance of survival of a comorbid ODGJ patient was 0.9961 (99.61%) greater than that of a non-comorbid odgJ patient is 0.9937 (99.37%), so it can be explained that in non-comorbide ODGJ patients they recovered faster than in comorbid ODGJ patients. However, this difference is not statistically significant, so it is necessary to do it with a Log-Rank test.

The Log-Rank Test

The Log-Rank test is used to analyze data on two groups associated with observing subjects in different conditions. Where in this study, the researchers observed the Log-Rank trial based on varibael gender, age, and comorbid and non-comorbid ODGJ patients. Thus, the analysis of the Log-Rank test can be seen in Table 6.

Table 6. Log-Rank Value of each variable

Variable	**Symbol**		**Conclusion**
	P-Value	*Sig*	
Female	4.40	3.84	Tolak H_0
Age	2.44	3.84	Gagal Tolak H_0
Comorbid and Non-Comorbid Patients	27.21	3.84	Tolak H_0

Female

Based on table 6 above obtain the Log-Rank test result where p-value (4.40) $> \alpha$ (3.84), then reject H_0. So there is a significant difference. Thus, it can be concluded that

there are significant differences between the cumulative survival chances of male and female ODGJ patients.

Age

Further on the basis of table 6 above obtained results of the Log-Rank test where p-value (2.44) $< \alpha$ (3.84), then failed to reject H_0**.** There is no significant difference. Therefore, it can be concluded that there is no significant difference between the cumulative survival odds of < 40 year old ODGJ patients and ≥ 40 year-old patients.

Comorbid and Non-Comorbid Patients

Based on table 6 above obtained results of the Log-Rank test where p-value (27.21) $> \alpha$ (3.84), then reject H_0. So there is a significant difference. Thus, it can be concluded that there are significant differences between the cumulative survival odds of comorbid ODGJ patients and non-comorbid ODGJ patients.

CONCLUSION

Based on the exposure of the results and discussion above, it is concluded that from the Kaplan-Meier method and Log-Rank Test based on gender, age, and positive ODGJ comorbid and non-comorbid that is based on the test results obtained with the help of R Studio software program version 2022.02.1+461 was that the survival function curve in ODGJ patients had an estimate of survival functions at ODGJ from a 2-day recovery time with a value of 0.99759 to 92 days with the value of 0,00000. Based on the results of the Log-Rank test with α = 0.05, obtained the test results for gender is 4.40 > 3.84, then rejected H_0, so there is a significant difference, and the results of survival estimation on the first day of male survival opportunities of 0.9931 (99.31%) are greater than women, namely 0.9919 (99. 19%), so that male patients recover longer than female patients; then the result of the Age-based Log-rank test is 2.44 < 3.84, there is no rejection H_0, so there are no significant differences, and the results of survival estimation on the first day of survival opportunities for patients aged < 40 years is 0. 992 (99.2%) is greater than the patient aged ≥ 40 years is 0.986 (98.6%), so that patients aged < 40 years recover faster than patients aged ≥ 40 years; and last Log-Rank results for comorbid and non-comorbid is 27.21 > 3.84, there are rejections H_0, so there is a significant difference, and the results of survival estimation on the first day the survival chance of comorbid patients is 0.9961 (99.61%) greater than that of non-comorbid patients which is 0.9937 (99.37%), so that non-comorbid patients recover faster than comorbid patients. It is recommended that for

previous research more supplement the raw data related to the data that has been processed in the study, summarize any part that would be important to become information and can go to the process to the next stage.

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