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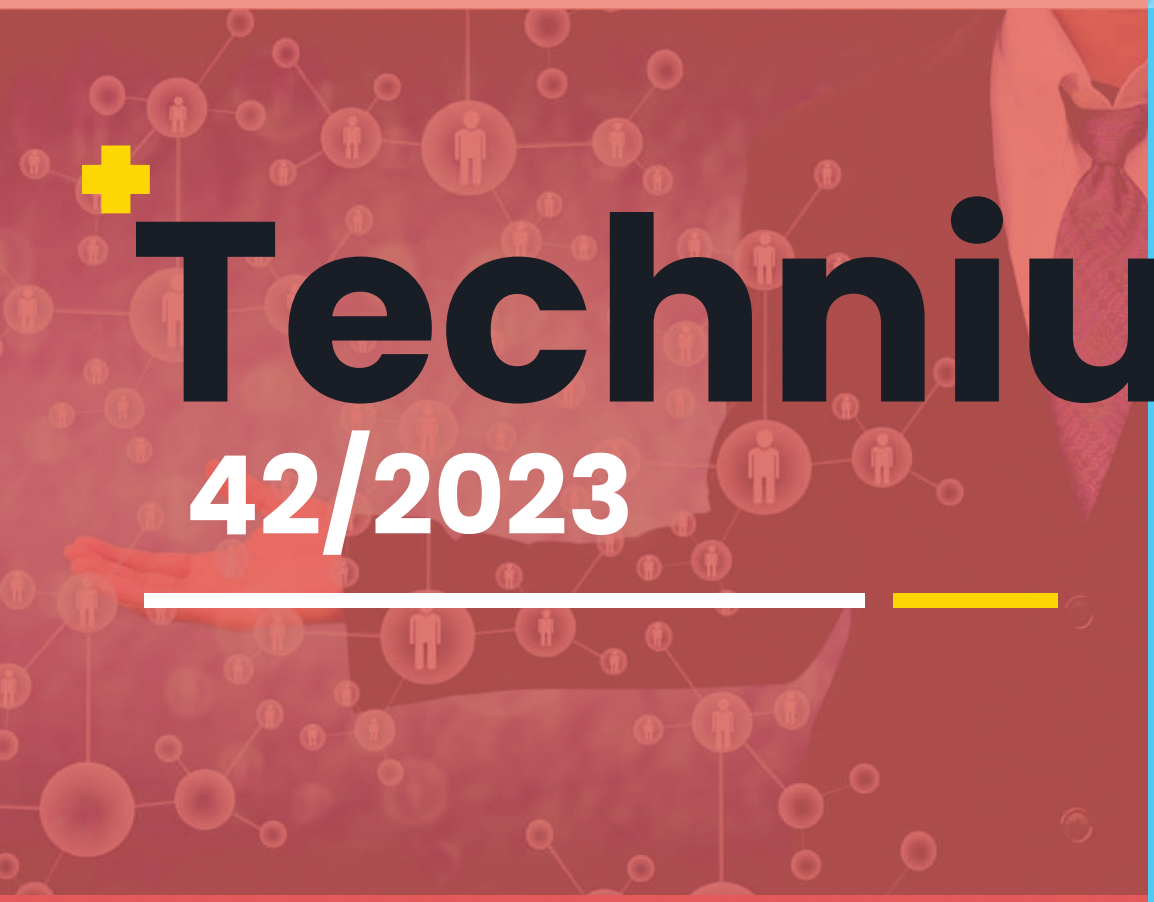

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Strategy for Services Anticipation at the Rehabilitation Center of BNN Based on Moving Average and Exponential Smoothing Forecasting Method

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Abstract. One of the Indonesian government's responses to the COVID-19 pandemic is making policies related to restrictions on public services which affects the organizational resilience of the Rehabilitation Center of the National Narcotics Board (BNN). This research aimed to determine the historical pattern of the influence of public service policies during the COVID-19 pandemic on the client population, to forecast the client population for 3 (three) months ahead, and to analyze strategies for anticipating rehabilitation services at the Rehabilitation Center of BNN. This research method is quantitative by using a moving average (MA) and exponential smoothing forecasting model. Based on the validity test, MA is the best forecasting model, which indicates a possibility of a spike in male clients with the same amount in the pre-pandemic period, as many as 310 people, and the average female client is 7 people. Meanwhile, adolescent clients show inaccurate prediction results with MAPE 149.825. Strategies that can be implemented to anticipate a spike in the number of clients if it reaches the highest forecasting point are: increasing the budget, modifying the rehabilitation program for female and adolescent clients, a balanced staff composition, and the availability of facilities and infrastructure.

Keywords. Forecasting, Moving Average, Exponential Smoothing, BNN Rehabilitation Center

1. INTRODUCTION

1.1. Background

Corona Virus Disease 2019 (COVID-19) pandemic that occurred globally at the end of 2019 quickly spread worldwide and affected many sectors (Wiswayana & Pinatih, 2020). One of the Indonesian government's responses to this is to provide policies related to restrictions on public services. Several public service restriction policies issued by the government at the national level, such as PP no. 21/2020 concerning Large-Scale Social Restrictions in the Context of Accelerating the Management of Corona Virus Disease 2019 (Covid-19); SE MenPAN-RB No. 58/2020 concerning the Work System for State Civil Apparatus in the New Normal Order; Minister of Health Decree No: HK.01.07/MENKES/328/2020 concerning Guidelines for Prevention and Control of Corona Virus Disease 2019 (COVID-19) in The Office and Industrial Workplaces in Supporting Business Continuity in a Pandemic Situation; SE Menkes No: HK.02.01/MENKES/335/2020 concerning Protocols for Prevention of Corona Virus Disease 2019 (COVID-19) Transmission in Service and Trade Sector Workplaces (Public Areas).

National service limitation policies are continued down to the regional level and the

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institutional scope. This policy has significantly impacted government organizations engaged in the public service sector. Types of services that are usually conventional, then are forced and quickly change and adapt to the conditions of COVID-19. The BNN Rehabilitation Center, as a government organization engaged in the public service sector for drug abusers, also implements the following policies: SE Head of the BNN Rehabilitation Center No: SE/007/III/BB/KP/2020/BNN concerning Adjustment of Rehabilitation Services related to Prevention of the Spread of COVID-19 at the BNN Rehabilitation Center; SE Head of National Narcotics Board No: SE/79/VI/KA/RH.00/2020/BNN concerning Guidelines for the Implementation of Rehabilitation Services in the New Normal Era in the Context of Prevention and Control of COVID-19; Circular Letter of the Head of BNN No: SE/56/VI/KA/KP.10/2021/BNN concerning Implementation of Tightening Work Systems for State Civil Servants in Suppressing the Spread of the Corona Virus (COVID-19) in the BNN Environment; SE Head of BNN Rehabilitation Center Number: SE/014/VII/BB/KP/2021/BNN regarding Enforcement of Limited Areas at the BNN Rehabilitation Center.

According to Sutrisno (in Mulianingsih (2019)), organizational competence and awareness to adapt and survive amid market conditions are some of the main demands of organizations in today's developments. The policy of limiting public services due to COVID-19 at the BNN Rehabilitation Center shocks organizational resilience. Some impacts include changes in service flow, service programs, budget revisions, limitations of client opportunities and access to therapy and rehabilitation services, the readiness of facilities and infrastructure, and human resources (HR). One example of the apparent impact of COVID-19 is the decrease in the number of inpatient clients that can be seen in the data in Table 1:

Table 1 Average Number of Clients for the Period January 2019 – December 2022

Month	2019	2020	2021	2022
January	280	440	159	209
February	262	408	108	203
March	241	342	124	125
April	250	281	154	116
May	257	239	159	112
June	262	176	174	155
July	292	136	179	187
August	324	106	167	221
September	358	95	171	232
October	388	110	177	219
November	427	139	205	208
December	449	171	214	198

(*source: Medical Records of Rehabilitation Center of BNN, January 2023*)

Information:

Client is a term used for drug abusers undergoing rehabilitation at the National Narcotics Board.

As a rehabilitation institution that uses *Therapeutic Community* (TC) as the primary modality in the rehabilitation program, the decrease of client is very influential for therapy activities and programs. According to De Leon & Unterrainer (2020), the TC modality can be interpreted as using the community as the principal capital in rehabilitation. Community teaches individuals to change themselves and be actively involved. Therefore, the community is both a

context and a mediator for personal and social changes that are undergoing recovery.

The female and adolescent rehabilitation program saw a significant decrease in clients. In the rehabilitation program for female clients, the lowest number of clients ever touched <5 clients in a day for the total number of clients starting from the physical and psychiatric monitoring and evaluation program, primary, and re-entry. Extreme conditions occur in rehabilitation programs for adolescents. The program was forced to stop running at the end of 2020. The number of adolescent clients is only 1 person in December 2020, which is impossible to carry out a rehabilitation program according to the TC method as previously described. In order to meet the standards of a community, adolescent clients (age 12-18 years) are combined with adult clients. However, it does not solve the problem because the type of therapy that should be given according to the needs of adolescents cannot be given optimally. A different condition occurred in 2019 when all rehabilitation programs were open and running well.

Regarding budgeting, some changes can be seen in the BNN Performance Report (LAKIP) from 2019-2021. In 2019, the BNN budget ceiling was Rp.1,555,050,644,000,-, with a budget absorption percentage of 97.98% (Badan Narkotika Nasional, 2020). The BNN budget ceiling for 2020 is Rp.1,650,244,863,000,-, with a budget absorption percentage of 94.18%. As we can see, there was an increase in the budget from the previous year. LAKIP BNN 2020 stated that one of the reasons for the decrease in budget absorption by 3.55% was due to the conditions of the COVID-19 pandemic, which impacted the implementation of activities in the field (Badan Narkotika Nasional, 2021). Meanwhile, in 2021, the BNN budget ceiling is Rp.1,439,346,780,000,-, with a budget absorption percentage of 98.19%. Absorption of the 2021 BNN budget has increased compared to 2021, but the budget ceiling has changed to a smaller number due to a policy of refocusing activities and budget reallocation (Badan Narkotika Nasional, 2022).

Based on the conditions above, it is crucial to forecast specifically for the context of the growth rate of clients at the National Narcotics Agency for Rehabilitation. According to Subagyo (in Wardah, (2016)), forecasting aims to minimize the effect of uncertainty on the company. In line with this, Prasetyo & Trisyanti (in Mulianingsih (2019)) stated that the organization is experiencing tremendous pressure to work in a dynamic environment with constantly changing events. Departing from these views, the BNN Rehabilitation Center needs to make forecasts to avoid uncertainty due to pressure in the form of the COVID-19 pandemic and its impact in the future. Almost all large, small, private and public organizations use forecasts either implicitly or explicitly because every organization should make a plan for service and its continuity in the future. Forecasting occurs in all organizational and functional lines and is needed in finance/budgeting, marketing, personnel, and production (Sarjono & Abbas, 2017).

Tarigan & Sagala (2021); Rumetna & Lina (2021) also conducted research using the moving average and exponential smoothing forecasting method. The results of both studies predict visiting patients in the future so that they can anticipate the lack source of power supporters, minimize excess supply, and give the best services to every patient, as well as being a reference on making decisions and establishing policies. In comparison, Nurfadilah et al., (2022) used the single moving average method for consumer price index (CPI) data for seven cities in West Java. The research results on CPI values using the 3-period single moving average method for September 2021 have decreased from the actual data for August 2021. The error value with MAPE is relatively small. Kusyanto et al., (2020); Rozikin et al., (2021); Nurlifa & Kusumadewi (2017) were used moving average and exponential smoothing methods forecast the company. The application of forecasting can assist the company in managing its product sales strategy for the future and in designing information systems to support purchasing

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decisions that can produce valid, fast, accurate, and to know how to build effective information systems in sales forecasting.

Although there has been previous research on various forecasting models using the moving average and exponential smoothing methods, this research has its uniqueness by taking the BNN Rehabilitation Center as the context that has never been raised before. The context of the COVID-19 pandemic also provides an update regarding conditions in the field. This research can help policymakers at the Rehabilitation Center of BNN. The policymaker can use this research as a consideration in order to build services that are right on target. Another consideration based on forecast results that have been processed based on existing data is to make strategies for anticipation of the provision of services, which include: flow and service programs, financial budget adjustments, HR capacity, and the completeness of facilities and infrastructure.

This research has the following objectives: to find out the historical pattern of the influence of public service policies during the COVID-19 pandemic on the client population; perform forecasting for the next 3 (three) months with a valid forecasting method for the average of all clients, male clients, female clients, and adolescent clients; as well as analyzing strategies for anticipating rehabilitation services at the Rehabilitation Center of BNN.

1.2. Theory and Concept

1.2.1. *Forecasting*

Forecasting is something activity or business to know about upcoming events that will happen later and come about an object certain with the use of judgments, experiences or historical data (Napa, 1990). Chase (in Satyarini, (2007)) divides period time forecasting into 3 parts: a long period of forecasting, which usually covers three years and more; a medium period of forecasting, usually in the range of one until three years; and a short period of forecasting. According to Barry R., Ralph M. Stair Jr., and Michael E. Hanna (in Sarjono & Abbas (2017)), there are 3 forecasting models: qualitative models, time series, and methods causal methods techniques. The forecasting model used in research is a time series model with moving average and exponential smoothing method.

1.2.1.1. *Method Moving Average Forecasting (MA)*

MA is a forecasting method that takes observational values and then looks for the average. The average value is then used as a forecast for the next period. The term moving average is used because whenever new observational data is available, the recent average is calculated and used as a forecast (Rozikin et al., 2021)

MA Formula:

$$Mt = Ft + 1 = \frac{Yt + Yt - 1 + Yt - 2 + \cdots + Yt - n + 1}{n}$$

Description:

Mt = MA in the period measured; Ft+1 = Forecast result; Yt = actual value of the previous period; n = amount limit.

1.2.1.2. *Method Exponential Smoothing Forecasting*

a. Single Exponential Smoothing (SES)

SES is generally used in short-term forecasting and is a smoothing method more suitable for predicting things that are fluctuating randomly or something that is not regular. This method assumes that data fluctuates around

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a fixed average value without any consistent trend or growth pattern (Marizal & Mutiarani, 2022).
SES Formula:
$Ft+1 = Ft + \alpha\,(Yt - Ft)$

Description:
Ft+1: new forecast (for time period t + 1); Ft: previous forecast (for time period t); α: constant alignment; and Yt: the actual value of the last period.

b. Double Exponential Smoothing (DES)

DES is a type of forecasting done when the data shows a consistent trend or change in the data obtained (Marizal & Mutiarani, 2022).
DES Formula:
$Lt = \alpha * Yt + (1 - a) * (Lt - 1 + Tt - 1)$,
$Tt = \beta * (Lt - Lt - 1) + (1 - \beta) * Tt - 1$,
$Ft + 1 = Lt + Tt$

Description:
Lt: an estimated level of the t period data series; Yt: the actual value in the previous period; Tt: an estimated previous trend in period t; α: constant alignment; β: constant smoothing; Ft+m: forecasting result; and m: the number of periods to be forecasted.

1.2.2. *Public Service Theory*

Amy Y. S. Rahayu, et al., (2020) describe the definition of public service: A) A) The public service is an interaction process whereby a relationship exists between the service provider (the government) and the service recipients (the community); B) The government, in this case, assigns tasks to the bureaucracy or the civil apparatus of the state as providers of public services; C) Using taxes as financing in public service; D) The executive and legislative using political mechanism as a process for determining public service rates. While Sinambela (in Widodo, Atim Widodo (2013)) provides an explanation of public service as any activity carried out by the government for a number of people who have every activity that is profitable in a group or unit and offers satisfaction even though the results are not tied to a product as a whole physique.

Ratminto & Winarsih (in Djadjuli (2019) assume that public or public services can be defined as all services. It includes the form of public goods and public services, which are the responsibility and carried out by government agencies at the central, regional and environment of State-Owned Enterprises or Regional-Owned Enterprises to fulfill community needs and in the context of implementing statutory provisions. Public services based on Act No. 25 of 2009 are activities or a series of activities fulfilling a service needs the following regulations and legislation for every citizen and resident in goods, services, and or administrative services provided by public service providers.

1.3. Method

1.3.1. *The Type of Research*

The approach used in this research is descriptive quantitative. Arikunto (in Jayusman & Shavab (2020)) explains that quantitative descriptive is a method that aims to create an objective picture or description of a situation using numbers, starting from data collection, interpretation

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of the data well as the appearance and results. This study uses the type of time series data. Time series data represents the realization of a random variable that usually has the same time interval and is observed in a certain period (Ashari, 2013). The research was conducted at the BNN Rehabilitation Center by gathering information on the number of clients who entered the rehabilitation program between January 2019 – December 2022.

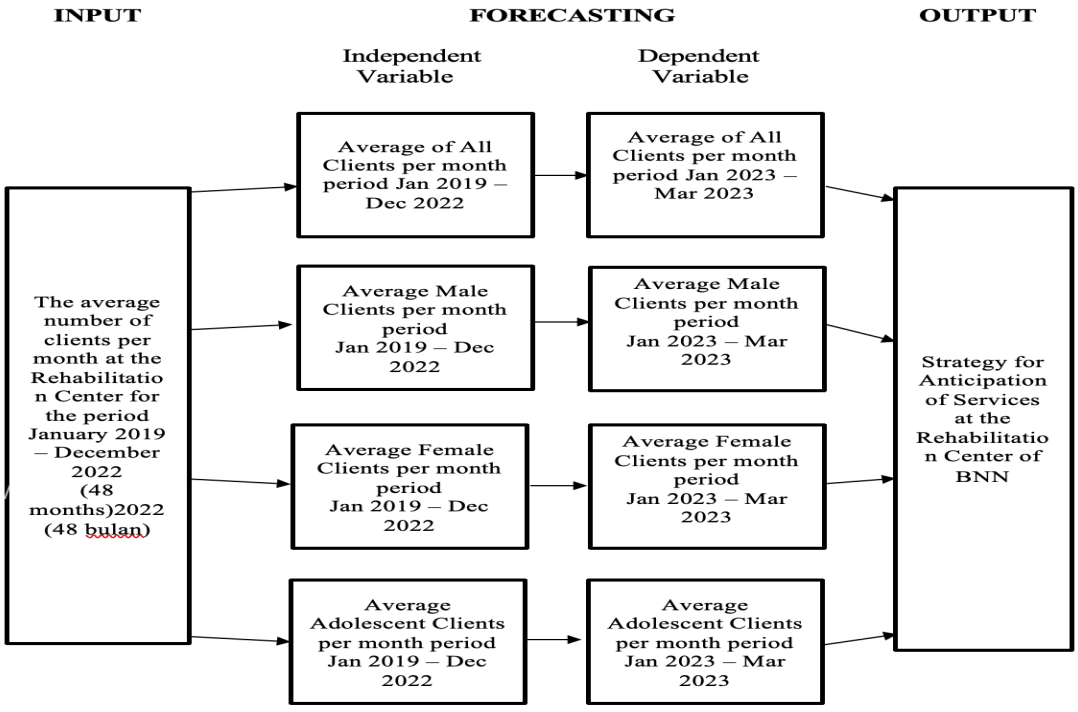
1.3.2. *Variables and Data Sources*

This research uses variables in a monthly time series. The dependent variable in this study is the average number of clients as a whole and per rehabilitation program from January – March 2023. The independent variable is the average number of clients overall and per rehabilitation program for January 2019 – December 2023 (48 months). This research uses secondary data from the medical record archives of the Rehabilitation Center of BNN.

1.3.3. *Data Collection and Processing*

Data processing using Minitab software is carried out to predict the number of client populations at the BNN Rehabilitation Center in the next 3 months (January – March 2023). Investigation of patterns in the data is done through display observations through graphics and plotting time series data (Assauri in Damanik et al., 2022). After identifying the pattern, proceed with the moving average forecasting model and exponential smoothing. The results of the forecasting model are then tested for validity. A validity test is done to find out whether the forecast can be said to be valid or not. If a model is declared valid, then the model can be forecasted, but if the model is declared invalid, then the model cannot be used for forecasting the next period. A model's size is valid if it has smaller MAD and MSE values and a MAPE value of less than 50% (good enough) (Damanik et al., 2022). The results of the best validity test are then used as the primary model for forecasting the client population of the BNN Rehabilitation Center for the next 3 (three) months.

1.3.4. *Conceptual Framework*



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2. RESULTS AND DISCUSSION

2.1. Historical Pattern of Client Population at the Rehabilitation Center of BNN

In Table 2 below, we can see the average number of clients in each rehabilitation program during the period January 2019 – December 2022:

Table 2 Average Amount of Male Clients, Female Clients, and Adolescent Clients for the Period of January 2019 – December 2022

Month / Program Type	2019			2020			2021			2022		
	M	F	Ad	M	F	Ad	M	F	Ad	M	F	Ad
January	256	19	4	408	21	11	141	17	1	204	5	0
February	211	18	5	375	21	12	91	17	0	199	4	0
March	217	17	7	310	22	11	107	17	0	122	3	0
April	226	16	7	258	14	9	138	15	0	110	5	0
May	235	13	9	223	10	6	146	13	0	107	5	0
June	242	9	10	167	7	1	164	10	0	148	7	0
July	271	10	11	129	7	0	170	10	0	179	7	0
August	302	10	12	100	6	0	159	8	0	215	7	0
September	334	10	14	87	5	3	163	8	0	226	6	0
October	359	13	16	98	9	4	170	7	0	213	6	0
November	396	17	15	124	12	2	198	7	0	201	7	0
December	414	21	14	153	17	1	208	6	0	191	7	0

(source: Medical Records of Rehabilitation Center of BNN, January 2023)

Description:
M: Male Clients; F: Female Clients; Ad: Adolescent Clients.

Table 2 shows that the average number of clients has decreased significantly since March 2020. The overall client average touched the lowest number of 95 people in September 2020, the average male client touched the lowest number of 87 people in September 2020, female clients touched the lowest number of 3 people in March 2022, and clients in the adolescent rehabilitation program since February 2021 were at 0. The historical pattern of the number of clients at the BNN Rehabilitation Center can be illustrated in Figures 1, 2, 3 and 4.

Figure 1 shows the highest average number of clients from August 2019 – March 2020, with an average number of clients >300 people. Since April 2022, there has been a significant decline in clients, with lows in September 2020. At the end of 2020, it slowly increased but again declined in February 2021.

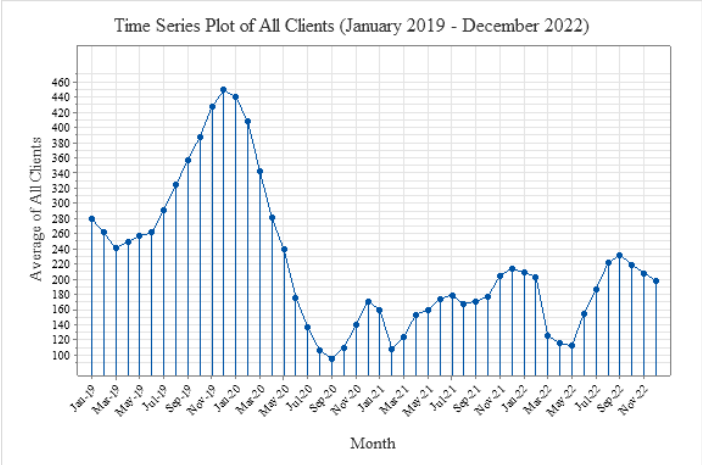

Figure 1 Time Series Plot of All Clients (January 2019 – December 2022)

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Figure 2 shows the highest average male clients from August 2019 – March 2020, with an average number of clients >300 people. Since April 2022, clients have significantly declined, with the lowest position in September 2020. It slowly crept up at the end of 2020, but in February 2021, it again experienced a decline.

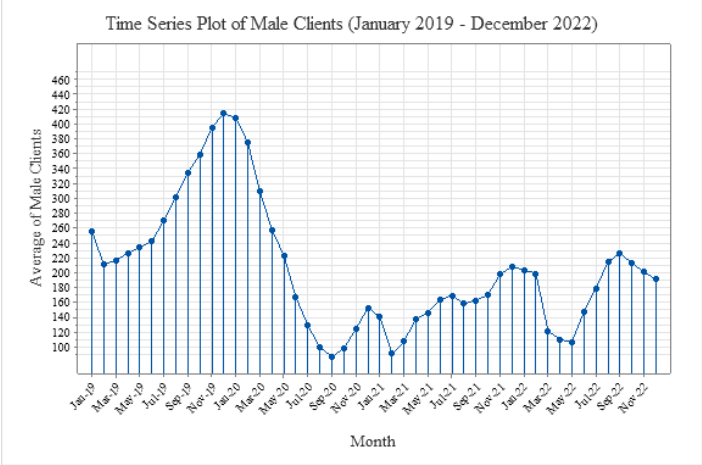

Figure 2 Time Series Plot of Male Clients (January 2019 – December 2022)

Figure 3 shows the highest average total female clients from December 2019 – March 2020, with an average less than 20 clients. From June – October 2022, there was a significant decline in client numbers under 10 people, with the lowest position in September 2020. At the end of 2020, it slowly increased. From November 2020 – July 2021, the number of clients was more than 10 people. From August 2021 – December 2022, the number of clients <10 people.

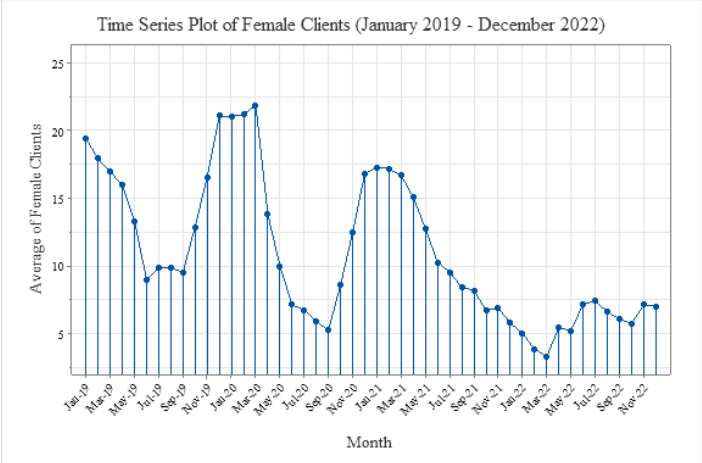

Figure 3 Time Series Plot of Female Clients (January 2019 – December 2022)

Figure 4 shows that the average number of clients for the adolescent rehabilitation program reached its highest number in October 2019, namely 16 people. From June 2019 – March 2020, the average number of clients is >10 people. There has been a significant decrease in clients reaching 0 since April 2022. From February 2021 – December 2022, the number of clients for adolescent rehabilitation programs is 0.

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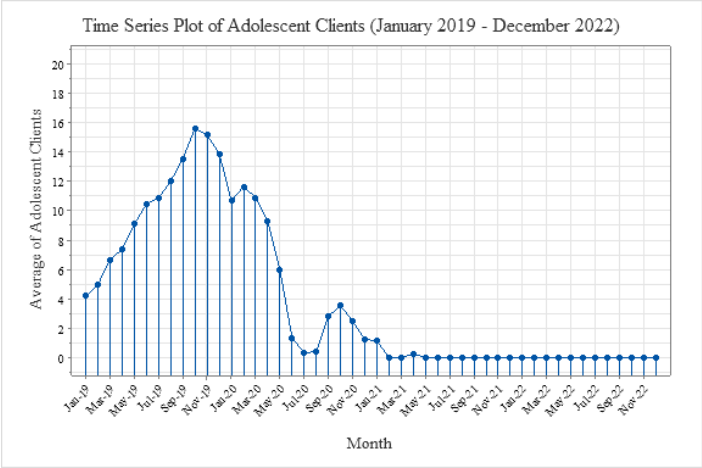

Figure 4 Time Series Plot of Adolescent Clients (January 2019 – December 2022)

2.2. Forecasting with the Moving Average (MA) Method

2.2.1. *MA of All Clients*

The results of forecasting with MA method show a difference between the actual and forecast data, which manifests the errors resulting from the forecast. In Figure 5, the MAPE value is 22.26 indicating an acceptable level of accuracy with a MAD value of 41.70 and an MSD value of 2705.50.

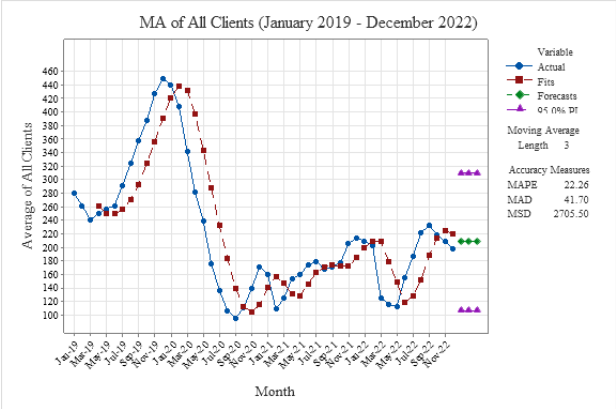

Figure 5 MA of All Clients (January 2019 – December 2022)

2.2.2. *MA of Male Clients*

Figure 6 shows the forecasting data with a MAPE value of 23.12 (reasonable accuracy level), a MAD value of 40.18 and an MSD value of 2407.99.

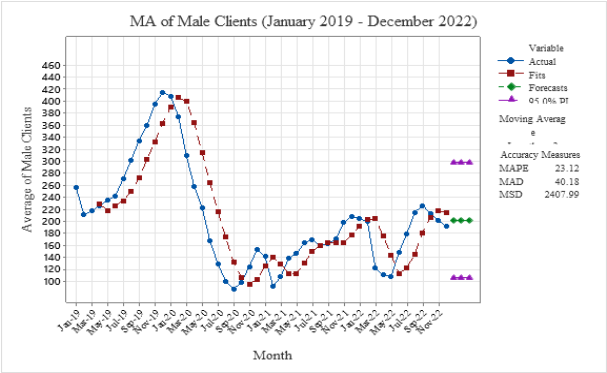

Figure 6 MA of Male Clients (January 2019 – December 2022)

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2.2.3. *MA of Female Clients*

Figure 7 shows the forecasting data with a MAPE value of 29.6424 (reasonable accuracy level), a MAD value of 2.9101 and an MSD value of 14.1502.

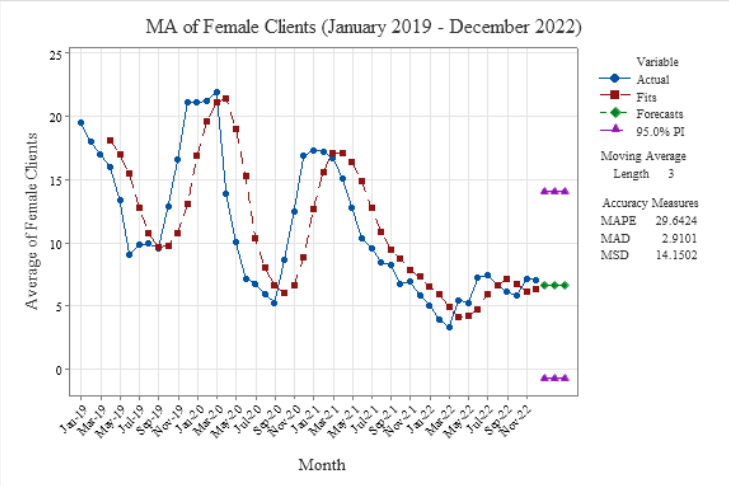

Figure 7 MA of Female Clients (January 2019 – December 2022)

2.2.4. *MA of Adolescent Clients*

Figure 8 shows the forecasting results with MAPE values, which can only be calculated for data >0. The MAPE value is 149.825, which means that the forecast results are inaccurate, the MAD value is 1.292, and the MSD value is 4.392.

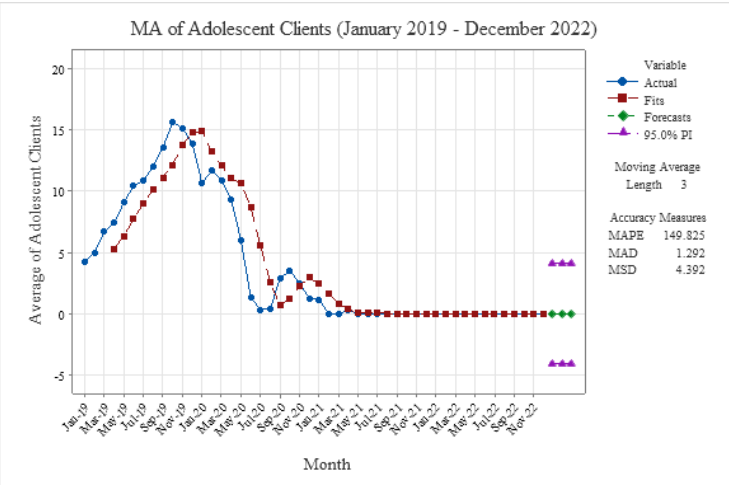

Figure 8 MA of Adolescent Clients (January 2019 – December 2022)

2.3. Forecasting with the Single Exponential Smoothing (SES) Method

2.3.1. *SES of All Clients*

The results of forecasting using the SES method show a difference between the actual and forecast data, which manifests the error resulting from the forecast. Figure 9 shows the forecasting data with a MAPE value of 24.14 (reasonable accuracy level), a MAD value of 43.69 and an MSD value of 3423.07.

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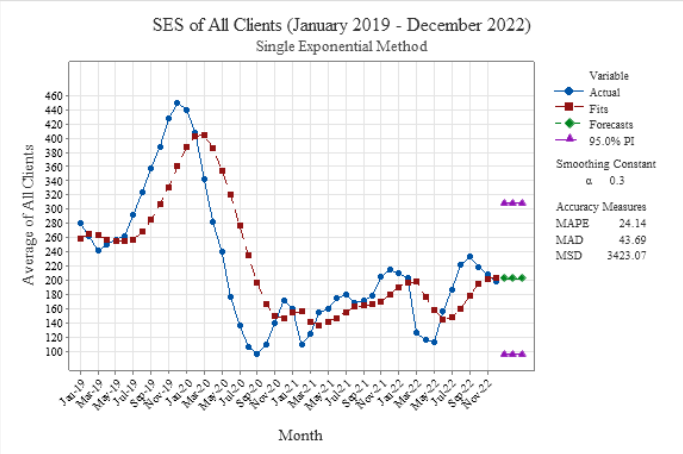

Figure 9 SES of All Clients (January 2019 – December 2022)

2.3.2. *SES of Male Clients*

Figure 10 shows the forecasting data with a MAPE value of 25.38 (reasonable accuracy level), a MAD value of 42.93 and an MSD value of 3057.91.

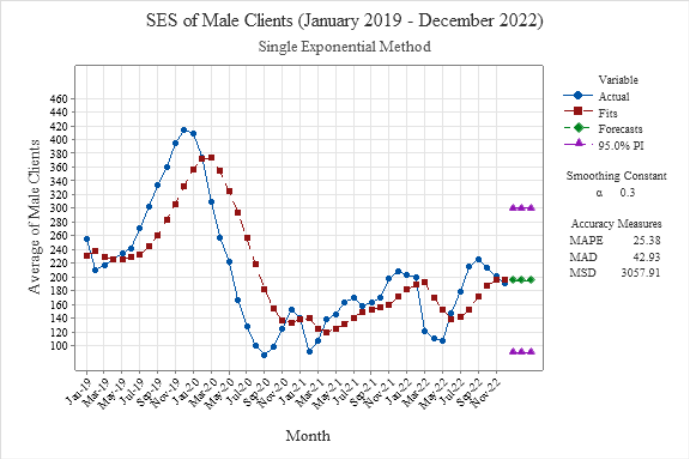

Figure 10 SES of Male Clients (January 2019 – December 2022)

2.3.3. *SES of Female Clients*

Figure 11 shows the forecasting data with a MAPE value of 33.7893 (reasonable accuracy level), a MAD value of 3.1964 and an MSD value of 15.1569.

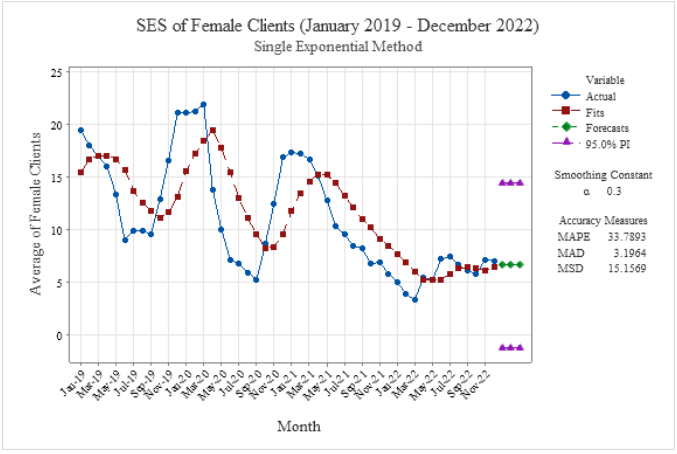

Figure 11 SES of Female Clients (January 2019 – December 2022)

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2.3.4. *SES of Adolescent Clients*

Figure 12 shows the forecasting results with MAPE values, which can only be calculated for data > 0. The MAPE value is 189.977, which means that the forecast results are inaccurate, the MAD value is 1.548, and the MSD value is 5.890.

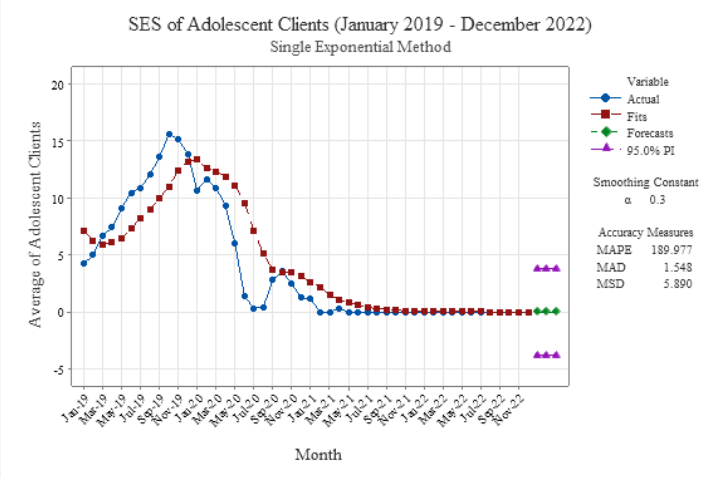

Figure 12 SES of Adolescent Clients (January 2019 – December 2022)

2.4. Forecasting with the Double Exponential Smoothing (DES) Method

2.4.1. *DES of All Clients*

The results of forecasting using the DES method show a difference between the actual and forecast data, which manifests the error resulting from the forecast. Figure 13 shows the forecasting data with a MAPE value of 29.95 (reasonable accuracy level), a MAD value of 55.82 and an MSD value of 4849.69.

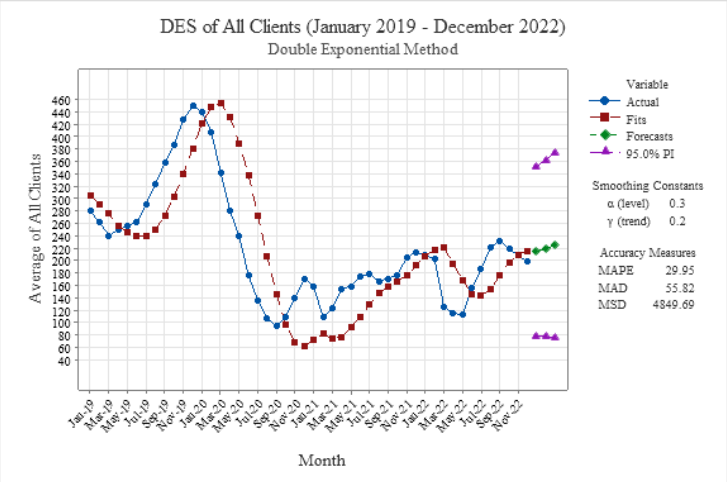

Figure 13 DES of All Clients (January 2019 – December 2022)

2.4.2. *DES of Male Clients*

Figure 14 shows the forecasting data with a MAPE value of 30.84 (reasonable accuracy level), a MAD value of 53.44 and an MSD value of 4330.72.

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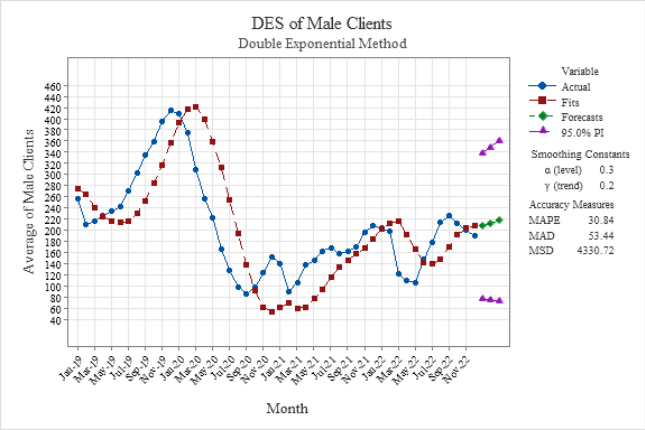

Figure 14 DES Average Male Clients (January 2019 – December 2022)

2.4.3. *DES of Female Clients*

Figure 15 shows the forecasting data with a MAPE value of 36.1377 (reasonable accuracy level), a MAD value of 3.6742 and an MSD value of 21.4488.

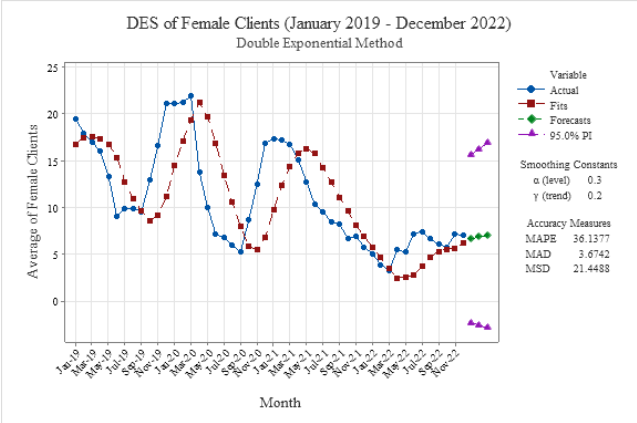

Figure 15 DES of Female Clients (January 2019 – December 2022)

2.4.4. *DES of Adolescent Clients*

Figure 16 shows the forecasting results with MAPE values, which can only be calculated for data >0. The MAPE value is 195.649, which means that the forecast results are inaccurate, the MAD value is 2.104, and the MSD value is 8.284.

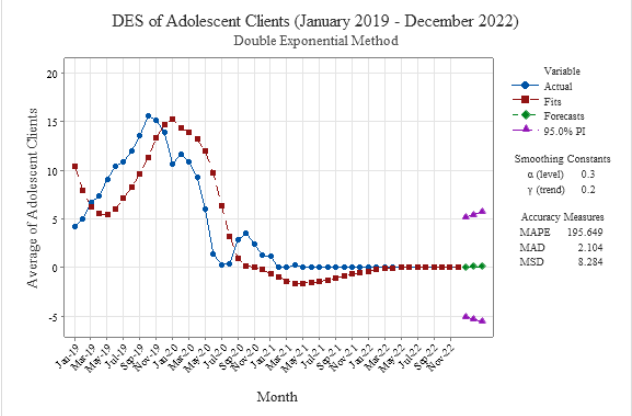

Figure 16 DES of Adolescent Clients (January 2019 – December 2022)

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2.5. Comparison and Validation of Forecasting Results

In order to determine the most appropriate forecasting method, the forecast results must be compared. The method with the lowest MAD, MSD and MAPE forecasting results is the closest to accurate or the most valid. Table 3 is a comparison of forecasting results that have been carried out using 3 methods above:

Table 3 Comparison of Forecasting Results

No.	Average Number per Rehabilitation Program	Forecasting Method	MAD	MSD	MAPE
1.	All Clients	Moving Averages (length 3)	**41.70**	**2705.50**	**22,26**
		Single Exponential Smoothing (α 0.3)	43,69	3423.07	24,14
		Double Exponential Smoothing (α 0.3 & γ 0.2)	55,82	4849.69	29.95
2.	Male Clients	Moving Averages (length 3)	**40,18**	**2407.99**	**23,12**
		Single Exponential Smoothing (α 0.3)	42.93	3057,91	25,38
		Double Exponential Smoothing (α 0.3 & γ 0.2)	53,44	4330.70	30,84
3.	Female Clients	Moving Averages (length 3)	**2.9101**	**14.1502**	**29.6240**
		Single Exponential Smoothing (α 0.3)	3.1964	15.1569	33.7893
		Double Exponential Smoothing (α 0.3 & γ 0.2)	3.6742	21.4488	36.1377
4.	Adolescent Clients	Moving Averages (length 3)	**1,292**	**4,392**	**149,825**
		Single Exponential Smoothing (α 0.3)	1,548	5,890	189,977
		Double Exponential Smoothing (α 0.3 & γ 0.2)	2.104	8,284	195,649

Based on the comparison results in table 3, it can be seen that the forecasting results using the MA method show the smallest values of MAD, MSD, and MAPE for all rehabilitation programs. In particular, it should be noted that the forecasting results with all methods show that the average number of clients in the adolescent rehabilitation program is inaccurate because it is at >50%, and the number of clients with 0 people cannot be counted. Thus it can be concluded that MA is the most appropriate method for predicting the average number of clients

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at the BNN Rehabilitation Center in January – March 2023. The forecasting results using the MA method for each rehabilitation program can be seen in Figures 17, 18, 19, and 20.

Figure 17 is the overall average client forecast for January – March 2023 (period 49 to 51 = January to March 2023). After experiencing rounding, it is concluded that 310 people have the highest forecasting results, 208 people have the average forecasting results, and 106 have the lowest. The highest forecasting results show the same number of clients (>300 people) as in August 2019 – March 2020, when the COVID-19 pandemic had not yet occurred.

Forecasts

Period	Forecast	Lower	Upper
49	208.347	106.401	310.293
50	208.347	106.401	310.293
51	208.347	106.401	310.293

Figure 17 All Clients Forecasting (January – March 2023)

Figure 18 shows the average forecast for male rehabilitation program clients from January to March 2023 (period 49 to 51 = January to March 2023). After experiencing rounding, it was concluded that 298 people had the highest forecasting results, 202 had the average forecasting results, and 106 had the lowest forecasting results. The highest forecasting results show the same number of male clients (> 260 people) as in August 2019 – March 2020.

Forecasts

Period	Forecast	Lower	Upper
49	201.722	105.544	297.900
50	201.722	105.544	297.900
51	201.722	105.544	297.900

Figure 18 Male Clients Forecasting (January – March 2023)

Figure 19 forecasts the average number of female clients for the next 3 months (period 49 to 51 = January to March 2023). After experiencing rounding, the highest forecasting result is 14 people, the average forecasting result is 7 people, and the lowest is -1. The highest forecasting results show the same number of clients (>10 people) as in July 2019 – May 2020.

Forecasts

Period	Forecast	Lower	Upper
49	6.62509	-0.747666	13.9978
50	6.62509	-0.747666	13.9978
51	6.62509	-0.747666	13.9978

Figure 19 Female Clients Forecasting (January – March 2023)

Figure 20 is the forecasting result for the average number of adolescent clients. After experiencing rounding, for the next 3 months (period 49 to 51 = January to March 2023), the average forecasting result is 0 people, the lowest forecasting result is -4 people and the highest is 4 people. Looking at the MAPE value of 149.825, which is in the inaccurate category, the forecasting results cannot be used.

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Forecasts

Period	Forecast	Lower	Upper
49	0	-4.10747	4.10747
50	0	-4.10747	4.10747
51	0	-4.10747	4.10747

Figure 20 Adolescent Clients Forecasting (January – March 2023)

2.6. Strategy for Rehabilitation Services

Based on the conditions in the field and the forecast results, the following are several strategies that the BNN can carry out for rehabilitation services:

a. Budget Addition

Since the outbreak of the COVID-19 pandemic, all government agencies have refocused and reallocated their budgets according to the circular letter of the Minister of Finance No. 6/MK.02.2020 concerning Refocusing and Reallocating Budgets for Ministries/Institutions in the Context of Accelerating Handling of Corona Virus Disease (COVID-19). The form of budget refocusing at the Rehabilitation Center in the form of cutting the total budget has an impact on reducing the number of client activity programs, as well as diverting funds to fulfill medical devices such as swab test kits, personal protective equipment, vitamins and medicines. Meanwhile, based on forecasting using the moving average method, it is estimated that the average number of all clients reaches the highest number of 310 people. This figure is the same as the number of clients before the pandemic. Soaring client conditions will shock the organization's resilience if it cannot be appropriately anticipated. Because of these conditions, anticipation is needed in the form of additional budgets to answer the need for rehabilitation services when the client's situation experiences a spike.

b. Modification of the Rehabilitation Program for Female Clients and Adolescent Clients

The forecasting result for female clients for the next 3 months is 7 people, while adolescent clients have inaccurate forecasting results. The adolescent rehabilitation program has not run since the end of 2020 because the client numbers have not been met to run the program according to the TC modality. Another reason is to maximize the effectiveness of the number of staff on duty. Since then, if clients enter rehabilitation aged 12-18 years (including in the category of children & adolescents), it is combined with an adult male rehabilitation program. This condition does not provide an ideal process for adolescents' recovery because their needs differ from adults.

Meanwhile, the challenge faced by the female rehabilitation program is in carrying out their daily activities. This challenge is related to the building's physical condition, which ideally can accommodate 50 people. Based on forecasting results, the average client is 7 people, and the highest forecasting results are 14 people. This situation burdens the client with daily activities such as cleaning the facility.

c. The Staff Composition

The Rehabilitation Center of BNN has 3 fields of staff: general staff, medical rehabilitation staff and social rehabilitation staff. In daily practice, medical and social rehabilitation staff interact more directly with clients. Table 4 is the list of medical and social rehabilitation staff at the BNN Rehabilitation Center as of November 1, 2022:

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Table 4 List of Staff Composition of Medical and Social Rehabilitation

No.	Profession	Decree of the Head of BNN No: KEP/ 173/IV/SU/KP/02.00/2015/BNN	Current Amount
Medical Rehabilitation			
1.	General Practitioners	15	8
2.	Psychiatrist	3	**3**
3.	Pulmonologist	3	0
4.	Internist	3	0
5.	Radiologist	3	0
6.	Neurologist	3	0
7.	Nurse	55	39
8.	Midwife	3	1
9.	Pharmacist	3	2
10.	Pharmacist assistant	3	2
11.	Dentist	3	**3**
12.	Electromedical	3	1
13.	Physiotherapy	3	1
14.	Nutritionist	3	1
15.	Health Laboratory	6	5
16.	Dental Nurse	3	1
17.	Radiographer	3	1
18.	Medical Record Technician	5	1
19.	Sanitarian	3	2
Social Rehabilitation			
20.	Counselor	20	**27**
21.	Assistant counselor	30	**31**
22.	Psychologist	10	5
23.	Vocational Instructor	10	3
24.	Mental Coach	10	**14**
	Total (Person)	206	151

(source: HR section of the BNN Rehabilitation Center, November 2022)

Data in Table 4 shows that only 5 professions have staff that meets/exceed the provisions in the Decree of the Head of BNN No: KEP/ 173/IV/SU/KP/02.00/2015/BNN regarding the Revision of the List of Employee Compositions within the National Narcotics Board. The five professions are psychiatric, dentist, counselor, assistant counselor, and mental coach. Meanwhile, 19 other professions are still experiencing a shortage of staff.

d. Availability of Facilities and Infrastructures

Based on the highest results in forecasting, the increase in clients will affect the need for facilities and infrastructure ranging from beds, personal needs of clients, and facilities that support therapy and rehabilitation.

3. CONCLUSIONS AND SUGGESTIONS

3.1. Conclusion

The COVID-19 pandemic has significantly impacted the average number of clients at the Rehabilitation Center of BNN. All rehabilitation service programs experienced a significant

decrease in the number of clients. Through forecasting using the moving average method, it is known that the highest forecast for the number of clients globally will experience a spike like the most elevated conditions before the COVID-19 pandemic. The spike in clients specifically occurred in the male rehabilitation program, which had 298 people for the highest forecasting results, 202 for the average forecasting results, and 106 for the lowest. In the rehabilitation program for female clients, the highest number of forecasters is 14 people, the average client is 7 people, and the lowest is -1 person. Meanwhile, the forecast results for the adolescent rehabilitation program are inaccurate because the MAPE value is 149.825.

Strategies that can be implemented to anticipate a spike in the number of clients if it reaches the highest forecasting point are: increasing the budget, modifying the rehabilitation program for female and adolescent clients, a balanced composition of staff and clients, and the availability of facilities and infrastructure.

3.2. Suggestion

Developing this research with other forecasting methods is recommended for future researchers conducting similar research. In addition, it can also make comparisons with other data and more training data, so it helps the forecasting results more precisely. Especially for forecasting for children and adolescent clients, further research is needed with updated data when the client's condition is >0.

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