Scientific Foundation SPIROSKI, Skopje, Republic of Macedonia
Open Access Macedonian Journal of Medical Sciences. 2022 May 13; 10(E):959-964.
https://doi.org/10.3889/oamjms.2022.9572
eISSN: 1857-9655
Category: *E - Public Health*
Section: *Public Health Legislation*

Healthy Latrine Utilization Model on Hinterland Area Community Based on Local Habits Knowledge of Latrines and their Characteristics in Batam City

Hengky Oktarizal[1,2]*, Yuanita Windusari[3], Irfannuddin[4], R. Kintoko Rochadi[5]

[1]Department of Environmental Sciences, Doctoral Degree Program of Environmental Sciences, Sriwijaya University, Palembang, Indonesia; [2]Department of Environmental Health Science, Faculty of Health Sciences, Ibnu Sina University, Batam, Indonesia; [3]Department of Public Health, Faculty of Public Health, Sriwijaya University, Palembang, Indonesia; [4]Department of Medicine, Faculty of Medicine, Sriwijaya University, Palembang, Indonesia; [5]Faculty of Public Health, University of Sumatera Utara, Medan, Indonesia

Edited by: Sasho Stoleski
Citation: Oktarizal H, Windusari Y, Irfannuddin, Rochadi RK. Healthy Latrine Utilization Model on Hinterland Area Community Based on Local Habits Knowledge of Latrines and their Characteristics in Batam City. Open-Access Maced J Med Sci. 2022 May 13; 10(E):959-964. https://doi.org/10.3889/oamjms.2022.9572
Keywords: Latrines; Hinterlanders; Models
***Correspondence:** Hengky Oktarizal, Department of Environmental Sciences, Doctoral Degree Program of Environmental Sciences, Sriwijaya University, Indonesia. E-mail: hengky.oktarizal@uis.ac.id
Received: 27-Mar-2022
Revised: 28-Apr-2022
Accepted: 03-May-2022

Funding: This research did not receive any financial support
Competing Interest: The authors have declared that no competing interest exists

Abstract

BACKGROUND: Local community issues (behavior/habits) The STBM (Sanitasi Total Berbasis Masyarakat) and triggering program strategy are ineffective. Several stakeholders' latrine facilities are underutilized. The community and the government are at odds. Some programs run about latrine issues (Health Department and CKTR [Cipta Karya dan Tata Ruang] Office), data collection for latrine ownership status is not well organized (it is not synchronized with city and sub-district data), and health officers/cadres do not understand the different types of latrines; permanent healthy latrines and semi-permanent healthy latrines demonstrate the importance of this research.

AIM: This study aims to develop a community empowerment model based on local wisdom in using healthy latrines in the Batam city hinterland area.

METHODS: The research was divided into two parts. The first was carried out with a quantitative approach using survey methods and questionnaires to identify the type of latrine use and the factors influencing latrine use, which were analyzed using Chi-square (α = 0.05). The second stage was qualitatively analyzed using three methods: Data condensation, data presentation, and conclusion. The Hosmer and Lemeshow test was used to determine the model's suitability. The number of samples was calculated using the Slovin method with cluster random sampling technique in the Batam city hinterland sub-district cluster.

RESULTS: The results showed that, in general, there was a relationship between the type of latrine use and the latrine use factor α = 0.05, there are seven significant factors of the community characteristics correlated with latrine utilization that can be used as part of the model out of 16. The logistic regression model used was quite good because it could correctly predict 94.6% of the conditions.

CONCLUSION: According to this study, people who live in permanent homes have a 4800 times greater chance of using latrines than those who live in semi-permanent dwellings. Those who express comfort with latrines permanently installed with septic tanks have a 303 times greater chance of using latrines.

Introduction

The toilet revolution has been a buzzword in China recently. This research conducted by Shikun Cheng *et al.* [1] and Ahmadi and Saputra [2] elaborates on the background, connotations, and actions of the toilet revolution in China. The toilet revolution aims to create a sanitation infrastructure and public service that works for everyone, turning waste into value.

The results of the WHO study state that in the proportion of the world's population, Indonesia occupies the second-highest level after India, namely, 58,000,000 people who still practice open defecation [3]. Moreover, a study from ISSDP in 2006 showed the number of Indonesian people who still defecated in addition to healthy latrines, including rivers, rice fields, ponds, gardens, seas, and other open environments, which was 47%, and a graph of the achievement of open defecation free (ODF) villages. In Indonesia, the % age of villages with new ODF status is 9,212. Based on the WHO data, it is estimated that 1.1 billion people, or 17% of the world's population, still defecate in open areas. People defecate in open areas, namely, India (58%), Indonesia (12.9%), China (4.5%), Ethiopia (4.4%), Pakistan (4.3%), Nigeria (3%), Sudan (1.5%), Nepal (1.3%), Brazil (1.2%), and Niger (1.1%) [4].

Health development is an effort carried out by all components of the nation to increase awareness, willingness, and ability to live healthy for everyone. It is hoped that there will be an increase in the highest degree of public health. One of the government's efforts to improve public health is the National Community-Based Total Sanitation (STBM) program [5].

The initial concrete form of government action on implementing sanitation policies globally

was the STBM policy, issued through the Decree of the Minister of Health of the Republic of Indonesia Number: 852/MENKES/SK/IX/2008. The Government of Indonesia officially established Community-Based Total Sanitation (STBM) as a National Strategy in 2008 as one of the integrated efforts to improve public health status through the Decree of the Minister of Health of the Republic of Indonesia Number 852/MENKES/SK/IX/2008 concerning National Strategy-Based Public. STBM is a participatory approach that invites the community to analyze their sanitation conditions through a triggering process so that people can think and take action to leave the habit of defecating in the open and in any place [4].

On the one hand, the Batam community in the hinterland area shows backwardness or backwardness with all the attributes accompanying it. On the other hand, the Batam community develops in the mainland area, which is advanced, controls economic resources, and has a progressive attitude. Such gaps in people's lives will eventually encourage destabilizing forces, which can develop into a severe obstacle or constraint to the development of modernization and sustainable industrialization in Batam in the future. The gap between the hinterland and mainland areas of Batam will become a destabilizing force, especially for the people living in the hinterland area. They will experience social dislocation, which can drive the emergence of "irritable people" because they think that modernization and industrialization in Batam are unfair, making them feel unfair – being left behind and missing out on many opportunities to develop [6].

The STBM program also contributed to the success of the 2015–2030 SDGs program targets, which contain 17 goals, one of which is the availability of access to clean water and sanitation. Each country must be able to implement the SDGs targets with sustainable development goals [7]. The results from the STBM evaluation monitoring data of the Ministry of Health in 2018 showed that from the ranking of STBM program achievements in Indonesia, the Riau Islands province is still the province with the lowest ODF program achievement, which is in the 26th position (score of 16,482) with a %age of access to sanitation of 67.63%, 56.73% of villages implementing STBM (236 villages/Kelurahan), and 13.94% of ODF verified villages (58 villages/Kelurahan) [8].

Batam City Health Office in 2019 reported that the number of sub-districts in the Sagulung sub-district is now six sub-districts. Moreover, the ones that have been verified are Sungai Lekop Village (100% ODF), Sagulung Kota (100% ODF), and Sungai Binti Village (100% ODF) under the working area of Sungai Lekop Health Center, while the other three sub-districts are in the sub-district of Sungai Lekop. Sagulung has not been verified by ODF, consisting of Kelurahan Tembesi (98.51% ODF), Sungai Pelunggut Village (98.62% ODF), and Sungai Langkai Village (99.91% ODF), which are under the working area of Sungai Langkai Health Center. Meanwhile, the working area of the puskesmas in the hinterland does not yet have ODF status [9].

The results of interviews conducted in February 2021 with environmental health program holders at the Batam City Health Office, Galang, Bulang, and Belakang Padang Health Centers in a preliminary study conducted by researchers showed that changing open defecation behavior through the STBM pillar, one program was felt to be very difficult to realize. Aside from cultural and social factors, geographical factors significantly impact the achievement of 100% ODF Kelurahan. As many as, 65% of the people in the working area of the Puskesmas are in the hinterland area [10].

Several special programs that have become priorities for the problem of using latrines have been given. The CKTR service has held communal latrines with a development program for communal scale septic tank sanitation of 5–10 families. Still, it is not utilized optimally by the community, so the existing communal latrines are increasingly damaged. The information obtained shows that CKTR has facilitated the provision of communal facilities using several funding allocations, such as the proposal for special allocation funds according to the needs and support from field facilitators by involving non-governmental groups. The local community's problems (behavior/habits), the STBM, and triggering program approach are not optimal. The latrine facilities provided by several stakeholders are not utilized. There is a gap between the community and the government. Some programs run related to latrine problems (Health Department and CKTR Office). Data collection related to latrine ownership status is poorly organized (not synchronized with city and sub-district data). Health officers/cadres do not understand the types of latrines; permanent healthy latrines are semi-permanent [11].

From the description illustrated, we want to know the hinterland community's knowledge and characteristics affect the utilization of healthy latrines.

Methods

This research was conducted with a quantitative approach. The quantitative data were carried out using survey and questionnaire methods to identify the types of latrine use in the hinterland area community in Batam city and the factors that influence the use of latrines based on local wisdom in the hinterland area in Batam city through a clustered random sampling approach which using Slovin formula to calculate the number of sample to the population; Chi-square was used to determine the correlation between latrine utilization to

the community characteristics and knowledge factors (α = 0.05). The significant elements to be added as the candidate of the model were selected using a partial test; three steps were used, including the candidate modeling test and the pseudo R-Square test. The final model was formulated using the logistic regression formula. After all the data were obtained, the Hosmer and Lemeshow test was used to determine the model's suitability [12].

Results

Table 1 shows 389 respondents, more respondents who use semi-permanent latrines with low education (85.4%) than respondents with higher education (62.7%). Statistical test results obtained p = 0.000. Because p-value (0.000) < alpha value (0.05) means Ho is rejected, it can be concluded that there is a relationship between education and the use of latrines in hinterland communities in Batam city. Meanwhile, respondents who use semi-permanent latrines are more knowledgeable (87.1%) than respondents with higher education (69.3%). As a result of the statistical analysis, the p-value was set at 0.000. A relationship between the use of latrines and knowledge in Batam city's hinterland communities has been established by the alpha value (0.05). Conversely, semi-permanent latrine users are more optimistic (81.6%) than those with negative attitudes (70.8%). The statistical test yielded p = 0.018, indicating a significant finding. Hence, the relationship between attitude and use of latrines in Batam city's hinterland communities can be concluded.

Table 1: Characteristics of hinterlanders in Batam city with Chi-square analysis versus independent variable (use of latrines)

Characteristics	n	%	p-value versus use of latrines (0.05)
Use of latrines (dependent)			
Permanent	89	22.9	
Semi-permanent	300	77.1	
Education			
Senior high school	142	36.5	0.000
<Senior high school	247	63.5	
Knowledge			
Good	218	56	0.000
Less	171	44	
Attitude			
Positive	228	58.6	0.018
Negative (disagree)	161	41.4	
Perception			
Agree	202	51.9	0.002
Negative (disagree)	187	48.1	
Comforts			
Comfortable with permanent type with septic tank	75	19.3	0.000
Comfortable with semi-permanent and open type	314	80.7	
Income			
Rp. 2,000,000	205	52.7	0.000
<Rp. 2,000,000	184	47.3	
Access			
Easy	389	100.0	-
Difficult	0	0	
Type of House			
House non-stilt	83	21.3	0.000
House on stilts	306	78.7	
Availability of clean water			
Yes	362	93.1	0.007
No	27	6.9	
The geographical location of the house			
Landward	83	21.3	0,000
Toward the sea	306	78.7	
Engagement			
Yes	192	49.4	0.388
No	197	50.6	
Exposure to mass communication media			
Ever	274	70.4	0.000
Never	115	29.6	
Coaching officers/cadres			
Yes	277	71.2	0.302
No	112	28.8	
Support of community leaders in the community			
Yes	295	75.8	0.091
No	94	24.2	
Total respondents	389	100.0	

Those who use semi-permanent latrines, on the other hand, have a more positive outlook (83.7%) than those who do not (70.1%).

p = 0.002 in the statistical tests was considered. To conclude, the hypothesis that there is no relationship between perception and use of latrines in hinterland communities in Batam city can be rejected. However, 86.3% of respondents who use semi-permanent latrines prefer semi-permanent and open types to those who prefer septic tanks (permanent latrines) (38.7%). p-value in the statistical tests was 0.000, so it can be concluded that the use of latrines in Batam city's hinterland communities correlates with comfortness.

As a result, 87.5% of respondents who use semi-permanent latrines have a lower income than permanent latrines (67.8%). p-value in the statistical tests was 0.000. Because of p-value (0.000), it can be concluded that income and latrine use are linked in Batam city's hinterland communities.

On the other hand, respondents who used permanent latrines and semi-permanent latrines stated that it was easy to access latrines. Therefore, no analysis was conducted.

The similarity of the analysis results of respondents who use semi-permanent latrines is more of the type of house on stilts (90.8%) than respondents whose home is not on stage (26.5%). p-value in the statistical tests was 0.000. Consequently, it can be concluded that the type of house and the use of latrines in Batam city's hinterland are linked. Other results with the same analysis were that more respondents who use semi-permanent latrines do not have clean water available (100%) than respondents who have clean water (26.5%). According to the statistical test results, p = 0.007 was considered. In Batam city's hinterland communities, there is a correlation between the availability of clean water and the use of latrines. Furthermore, there is a correlation between geographic location and the use of latrines in Batam city's hinterland communities. Respondents who do not use semi-permanent latrines are less likely to be exposed to mass media than those who do. In Batam city's hinterland communities, latrines are linked to exposure to mass communication media.

No significant difference was found between the number of respondents who use semi-permanent latrines and those that participate in the community. In

Batam city's hinterland communities, there appears to be no link between community involvement and the use of latrines. In addition, the use of latrines in Batam city's hinterland communities also has no connection to the training of officers/cadres, it can be concluded. Latrines in Batam city's hinterland communities were not linked to community leaders' support for the project.

Four of the 15 variables tested in Table 2 were found not to correlate, including age, community involvement, officer development, and support from community leaders. As a result, the response has 10 potential predictor variables. Regression analysis cannot be performed without determining whether the predictor and response variables are related. The Chi-square test results show this, which uses a 5% significance level.

Table 2: The results of the independence test between the response variable and the predictor variable

Variable	Chi-square	p-value (sig.)	Conclusion
Education	25.172	0.000	Related
Knowledge	16.343	0.000	Related
Attitude	5.610	0.018	Related
Perception	9.437	0.002	Related
Comforts	75.191	0.000	Related
Income	20.215	0.000	Related
access	-	-	Constant
Type of house	149.572	0.000	Related
Availability of clean water	7.270	0.007	Related
The geographical location of the house	29.742	0.000	Related
Engagement	0.744	0.388	Not related
Exposure to mass communication Media	15.348	0.000	Related
coaching officers/cadres	1.067	0.302	Not related
Support of community leaders in the community	2.856	0.091	Not related

Attitude, perception, education, knowledge, comfort, income, type of house, geographical location, and exposure to mass communication media are the variables with p = 0.25 in Table 3. The variable with a value greater than 0.25 is the availability of clean water. As a result, water availability variables are excluded from multivariate tests. Attitude, perception, education, knowledge, comfort, income, type of house, geographical location, and exposure to mass communication media are the variables with p = 0.25, as shown in Table 3. The variable with a value greater than 0.25 is the availability of clean water. As a result, water availability variables are excluded from multivariate tests.

Table 3: Modeling candidate test analysis results

Variable	p-value (sig.)
Availability of clean water	0.998
Attitude	0.013
Perception	0.002
Education	0.000
Knowledge	0.000
Comfort	0.000
Income	0.000
Types of houses	0.000
Geographical location	0.000
Exposure to mass communication media	0.000

Table 4 obtained the value of R-square for each formed using the backward method. However, what needs to be considered is the value of R-square in the 3rd step because this model is a model with significant independent variables. The value of R square is worth 0.800, and Cox and Snell R square is worth 0.527. This means that the variations that occur in the use of latrines in the Hinterland community of Batam city can be explained by variable attitudes, perceptions, education, knowledge, comfort, income, house type, geographical location, and exposure to mass communication media by 52.7% and 100%–52.7% = 47.3% caused by other factors.

Table 4: Pseudo R-square result

Step	−2 Log-likelihood	Cox and Snell R-square	Nagelkerke R-square
1	126.005[a]	0.528	0.802
2	126.554[a]	0.528	0.801
3	126.930[a]	0.527	0.800

From Table 5 output obtained, the results of two variables are eliminated, namely, perception and knowledge. Thus, the factors that affect the use of latrines in the people of hinterland Batam city are variable attitudes, education, comfort, income, type of house, geographical location, and exposure to mass communication media. The most dominant or significant risk factor affecting the use of latrines in the hinterland community of Batam city is the type of house.

After knowing the variables that significantly affect the response variables, a logistic regression model is formed.

Equation 1: The model of latrine utilization

$$Y = -10.257 + 4799.531\ X5 + 302.724\ X3 + 75.753\ X7 + 21.635\ X2 + 7.950\ X4 + 0.206\ X1 + 0.051\ X6$$

To find out whether the model has been able to explain the data or not, a model conformity test is carried out using the Hosmer and Lemeshow test methods, as shown in Table 6.

Discussion

In this study, one of the weaknesses faced was obtaining data from respondents due to the difficulty accessing research sites that spread and separated from each other's islands.

A significant relationship between the type of house and the use of latrines can be inferred from bivariate analysis, with p = 0.000 and Exp (B) 4799,531, indicating that those living in permanent homes have a 4799, 531% greater likelihood than those in semi-permanent homes of using latrines in Batam city's hinterland. The majority of people who live in the hinterland area, especially the city of Batam, have a type of house with a stage type with a cornerstone of milestones that support the home in coastal and marine areas. This has become a form of local wisdom, especially in the form of a typical Malay house. Thus, the type of house that becomes the dominant factor is needed to coordinate and harmonize programs from across sectors in designing the concept of healthy

Table 5: Partial test results of factors related to the use of latrines in the hinterland community of Batam city

Variables	B	Wald	df	Sig.	Exp (B)	95% C.I. for Exp (B)	
						Lower	Upper
Step 1[a]							
Attitude	−1.645	6.581	1	0.010	0.193	0.055	0.678
Perception	−0.539	0.568	1	0.451	0.583	0.143	2.372
Education	3.047	10.455	1	0.001	21.046	3.320	133.421
Knowledge	0.483	0.569	1	0.451	1.620	0.462	5.679
Comfort	5.447	32.005	1	0.000	231.959	35.149	1530.772
Income	1.963	7.088	1	0.008	7.117	1.678	30.182
House type	8.158	28.573	1	0.000	3490.710	175.331	69497.624
Geographical location	−3.009	7.414	1	0.006	0.049	0.006	0.430
Exposure to mass communication media	4.166	15.692	1	0.000	64.462	8.206	506.409
Constant	−9.801	31.361	1	0.000	0.000		
Step 2[a]							
Attitude	−1.580	6.323	1	0.012	0.206	0.060	0.706
Education	2.997	10.509	1	0.001	20.016	3.270	122.514
Knowledge	0.387	0.373	1	0.542	1.472	0.426	5.091
Comfort	5.665	35.313	1	0.000	288.495	44.538	1868.736
Income	1.975	7.533	1	0.006	7.203	1.759	29.506
House type	8.381	30.910	1	0.000	4363.190	227.325	83745.518
Geographical location	−2.956	7.447	1	0.006	0.052	0.006	0.435
Exposure to mass communication media	4.099	14.777	1	0.000	60.299	7.458	487.547
Constant	−10.016	31.837	1	0.000	0.000		
Step 3[a]							
Attitude (X1)	−1.392	6.714	1	0.010	0.249	0.087	0.712
Education (X2)	3.074	11.325	1	0.001	21.635	3.610	129.649
Comfort (X3)	5.713	36.166	1	0.000	302.724	47.038	1948.259
Income (X4)	2.073	8.591	1	0.003	7.950	1.987	31.802
House type (X5)	8.476	31.895	1	0.000	4799.531	253.306	90939.464
Geographical location (X6)	−2.970	7.515	1	0.006	0.051	0.006	0.429
Exposure to mass communication media (X7)	4.327	18.589	1	0.000	75.753	10.593	541.710
Constant	−10.257	34.398	1	0.000	0.000		

latrines from the kind of houses of the people of the hinterland area of Batam city with coastal and island characteristics [13].

According to the study results, 302,724 times more people prefer semi-permanent latrines equipped with a septic tank than those who do not. This is indirectly related to the type of house, where most community houses are not directly built on the ground but above the sea, so they prefer to throw feces now into the sea [13].

Table 6: Hosmer and Lemeshow test value results

Step	Chi-square	df	Sig.
1	47.968	8	0.000
2	76.053	8	0.000
3	43.300	8	0.000

However, respondents using semi-permanent latrines were more prevalent than those who used other latrines, as evidenced by the Exp (B) 75,753, which indicates that mass communication media have a chance of 75,753 times greater than those who use other types of latrines. This suggests that exposure to mass media also affects people's mindsets, creating a reluctance to use healthier latrines [2].

Most respondents used semi-permanent latrines with less than a high school diploma (62.7%). A person with an Exp (B) score of 21,635 is more likely to use a latrine than a person with a lower Exp (B) score. Education has been linked to latrines with an OR value of 3,918, meaning that respondents with higher education have 4 times the chance of using latrines. This certainly shows that the higher a person's level of education, the higher the awareness of using healthy latrines [2].

Latrines are more commonly used by people with low incomes (67.8%) than by people with high incomes Exp (B) value, which is 7,950 times more likely to use latrines than someone who earns less money. At 83.9%, urban households are more likely to have this type of latrine than rural households, according to Riskesdas [14] (56.0%). There is a correlation between household expenditure per capita and the number of people who use latrines good for their health.

Compared to other latrines, those in the community who used semi-permanent ones displayed a more positive attitude (81.6%). People with a positive attitude have a 0.206 times greater chance of using latrines than those with a negative attitude. According to Pane [15], there is a significant relationship between attitudes and behavior in latrines with an OR score of 8.4547, which means that families who have a positive attitude toward latrines have an 8 times greater chance of using latrines. This shows that although people use unhealthy latrines, they understand better and healthier. However, due to economic and other factors, they still choose semi-permanent latrines.

Geographical location has no bearing on how many latrines are used at a given house. Exp (B) 0.051 shows that the difference in latrine accessibility based on site is only 0.051 times greater.

Conclusion

According to this study, people who live in permanent homes have a 4800 times greater chance of using latrines than those who live in semi-permanent dwellings. Those who express comfort with latrines permanently installed with septic tanks have a 303 times greater chance of using latrines. This individual has

been exposed to information about the significance of latrine accessibility through the media. When compared to those who have never heard of the importance of the availability of restrooms in the mass media, a highly educated person has a 22 times greater chance of using latrines than those who are less well-educated, an individual with a high income has an 8 times greater chance of using latrines and an individual with a positive attitude toward the use of healthy latrines. Compared to people with a positive (agree) attitude, you have a 0.2 times greater chance of using latrines. Compared to people who live near the sea, you have a 0.05 times more significant opportunity to use latrines. About 94.6% of the conditions can be correctly predicted by the logistic regression model used.

References

1. Cheng S, Li Z, Uddin SM, Mang HP, Zhou X, Zhang J, *et al.* Toilet revolution in China. J Environ Manage. 2018;216:347-56. https://doi.org/10.1016/j.jenvman.2017.09.043
   PMid:28941832
2. Ahmadi A, Saputra R. Status analysis open defecation free (ODF) of land availability and economic status in Sagulung district, Batam city. J Kesehat Ibnu Sina. 2021;2(01):1-7.
3. World Health Organization. Guidelines on Sanitation and Health. Geneva: World Health Organization; 2018.
4. Keputusan Menteri Kesehatan Republik Indonesia. Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/ MenKes/413/2020 Tentang Pedoman Pencegahan dan Pengendalian Corona Virus Disease 2019 (Covid-19). MenKes/413/2020. 2020;2019:207.
5. Dit. PL DP-PKKRI. Kurikulum dan Modul Pelatihan Fasilitator Pemberdayaan Masyarakat Bidang Kesehatan. In: Buku Sisipan STBM. Jakarta: Dit. PL DP-PKKRI; 2013.
6. Setyohadi I. Karakteristik dan Pola Pergerakan Penduduk Kota Batam dan Hubungannya Dengan Perkembangan Wilayah Hinterland. J Dimens. 2016;4(1). https://doi.org/10.33373/dms.v4i1.33
7. Assembly G. Sustainable development goals. SDGs Transform Our World. 2015;2030.
8. Penyehatan Lingkungan Dinas Propinsi Kepulauan Riau. Perkembangan Sanitasi Total Berbasis Masyarakat (STBM); 2012.
9. Dinas Kesehatan. Profil Kesehatan Kota Batam Tahun 2018. Profil Kesehat Kota Batam; 2018.
10. Patmawati P, Ningsi S, Lisnawati L. Hubungan Perilaku Hidup Bersih dan Sehat Terhadap Kejadian COVID-19 DI Pasar Wonomulyo Latar Belakang Pasar termasuk tempat-tempat umum di mana banyak orang berkumpul Menjaga suatu bentuk interaksi atau hubungan satu sama lain. Interaksi Antara Penjual d. 2021;9(1):127-37. https://doi.org/10.31596/jkm.v9i1.809
11. Ditjen Cipta Karya Dpplpkpu. Sanitasi Perkotaan Berbasis Masyarakat. Jakarta: Dinas Cipta Karya;2021.
12. Hosmer DW Jr., Lemeshow S, Sturdivant RX. Applied Logistic Regression. Vol. 398. Hoboken, NJ: John Wiley & Sons; 2013.
13. Roper TJ, Conradt L, Butler J, Christian SE, Ostler J, Schmid TK. Territorial marking with feces in badgers (Meles meles): A comparison of boundary and hinterland latrine use. Behavior. 1993;127(3-4):289-307.
14. Kemetrian Kesehatan Republik Indonesia. Basic Health Research 2018. Riskesdas 2018; 2018.
15. Cunha DG, Calijuri MD, Grull D, Mancuso PC, Thevenot DR. *In situ* remediation technologies associated with sanitation improvement: An opportunity for water quality recovering in developing countries. In: Ecological Water Quality - Water Treatment and Reuse. London: IntechOpen; 2012.