

Sanitation and Physical Quality of Water Refilled Drinking Water Depot in the Working Area of Kotaraja Puskesmas

Nita¹, Hasmi^{2*}, Novita Medyati³, Agus Zainuri⁴, Sarce Makaba⁵, Arius Togodly⁶

Master of Public Health Study Program, Faculty of Public Health, Cenderawasih University, Jayapura

Corresponding Author: Hasmi hasmiuncen@yahoo.co.id

ARTICLE INFO

Keywords: Sanitation, Physical Quality of Water, Refill Drinking Water Depot

Received : 2 May

Revised : 18 June

Accepted: 23 July

©2024 Nita, Hasmi, Medyati, Zainuri, Makaba, Togodly: This is an open-access article distributed under the terms of the [Creative Commons Atribusi 4.0 Internasional](https://creativecommons.org/licenses/by/4.0/).



ABSTRACT

Data on the sanitation quality of refill drinking water depots in the Kotaraja Community Health Center working area is 30% not meeting the physical feasibility requirements. The research aims to determine the sanitation and physical quality of refilled drinking water in the Kotaraja Community Health Center Working Area. Type of quantitative descriptive research. The population is 36 drinking water depots. Data measurement uses an observation sheet instrument. The research results were obtained from sanitary conditions of the 36 refill drinking water depots in the Kotaraja Community Health Center working area where 11 depots (30.6%) did not meet the requirements and 25 depots (69.4%) met the criteria. Equipment sanitation 4 depots (11.1%), does not meet the requirements and meets the requirements of 32 depots (88.9%). Physical quality of drinking water from the results of equipment sanitation and processing there are 7 depots (19.4%) do not meet the requirements 29 depots (80.6%) met the criteria

INTRODUCTION

Drinking water is water that has been processed with treatment that meets health requirements, water is suitable for drinking when it meets physical, microbiological, chemical, and radioactive requirements. The physical requirements for clean water are that water has no color, no taste, and no smell. The chemical requirement for clean water is that it does not contain chemical substances that are harmful to human health.

The community's need for drinking water can be resolved with the existence of Refillable Drinking Water which can be purchased at Depots. Water for human consumption must be obtained from clean and safe sources. The requirements are, free from bacterial contamination and sources of disease, free from dangerous and toxic chemicals, tasteless and odorless, can be used to meet household needs, and comply with the minimum standards set.

Many refill drinking water depots whose water production does not comply with existing water quality standards. Therefore, strict supervision is needed over the drinking water refill depot business, so that implementation can meet drinking water quality standards that have been determined by existing laws and regulations.

Based on records from the Central Statistics Agency for 2021 (BPS), as many as 90.78% of households in Indonesia have received an adequate source of drinking water. This figure increased by 0.57 points from last year's 90.21%, Papua is the province with the lowest national percentage of households receiving adequate drinking water sources, namely only 64.92%.

The city of Jayapura is an area that is experiencing rapid development which is marked by an increase in population every year, so that this condition contributes to the water needs of the people who live in the city of Jayapura, according to data from BPS Papua in 2017, the number of water depots in the city of Jayapura is 53.01%.

LITERATURE REVIEW

Kotaraja Community Health Center has 36 drinking water depots that have been registered with Kotaraja Community Health Center, The Vim sub-district has 15 water depots, Wahno sub-district has 11 water depots, and Mhorock sub-district has 10 water depots. As a form of ensuring safety from the health aspect at the water depot, the Health Service has issued a certificate of appropriate hygiene and sanitation, which is written evidence issued to explain that the drinking water depot has met the quality standards or requirements for drinking water quality and hygiene and sanitation requirements.

METHODOLOGY

Type of quantitative descriptive research. The population is 36 water depots. Data measurement uses an observation sheet instrument.

RESULT

Table 1. Drinking Water Refill Depot Place in the Kotaraja Community Health Center Working Area Jayapura City in 2023

No	Items	TM		M.S		Amount	
		N	%	n	%	n	%
1	The location is free from pollution and disease transmission	0	0	36	100	36	100
2	The building is strong, safe, easy to clean and easy to maintain	12	33.3	24	66.7	36	100
3	The floor is waterproof, the surface is flat, smooth, not slippery, does not crack, does not absorb dust, and is easy to clean, and the slope is quite gentle	14	38.9	22	61.1	36	100
4	The walls are waterproof, the surface is flat, smooth, not slippery, does not crack, does not absorb dust, and is easy to clean, and the color is bright and bright	12	33.3	24	66.7	36	100
5	The roof and ceiling must be strong, rat-proof, easy to clean, not absorb dust, have a flat surface, and be light in color, and have sufficient height.	13	36.1	23	63.9	36	100
6	The spatial layout consists of a processing room, storage, distribution/provision, and a waiting room for visitors/consumers	6	16.7	30	83.3%	36	100
7	The lighting is bright enough for work, not dazzling and evenly distributed	4	11.1	32	88.9	36	100
8	Ventilation ensures good air circulation/exchange	4	11.1	32	88.9	36	100
9	Air humidity can support comfort in carrying out work/activities	3	8.3	33	91.7	36	100
10	Has bathroom and latrine access	0	0	0	100	36	100
11	There is a waste water drainage channel that flows smoothly and is closed	9	25	27	75	36	100
12	There is a closed trash can	18	50	18	50	36	100
13	There is a hand washing area equipped with running water and soap	11	30.6	25	69.4	36	100
14	Free from mice, flies and cockroaches	12	33.3	24	66.7	36	100

Table 1 shows that the condition of the refilled drinking water depot meets the 100% requirement, namely that the location is free from pollution and disease transmission. Other items mostly meet the requirements, namely strong, safe, easy to clean, and easy to maintain buildings with 24 depots (66.7%), watertight floors, flat surfaces, smooth, non-slip, no cracks, do not absorb dust, and easy to clean, sufficient slope slopes for 22 depots (61.1%),

watertight walls, flat, smooth, non-slip, no cracks, do not absorb dust, and are easy to clean, as well as bright and bright colors for 24 depots (66.7%), roofs and ceilings strong ceiling, anti-rat, easy to clean, does not absorb dust, flat surface, bright color, and sufficient height for 23 depots (63.9%), processing, storage, distribution/provision space, and visitor/consumer waiting room for 30 depots (83.3 %), lighting is bright enough, not dazzling and evenly distributed in 32 depots (88.9%), good ventilation/air circulation in 32 depots (88.9%), air humidity can support comfort in carrying out work/activities in 33 depots (91.7%). Other sanitation facilities include access to bathrooms and toilets in 36 depots (100%), there are wastewater drainage channels that flow smoothly and are closed, in 27 depots (75%), there are closed rubbish bins in 18 depots (50%), there hand washing places. Equipped with running water and soap in 25 depots (69.4%) and free from rats, flies, and cockroaches in 24 depots (66.7%).

Table 2. Conditions for Requirements for Drinking Water Refill Depot Locations in the Kotaraja City Health Center Working Area, Jayapura City in 2023

No	Assessment Items	n	%
1	Not eligible	11	30.6
2	Qualify	25	69.4
	Amount	36	100

The results in table 2 show that the condition of the 36 refill drinking water depots in the Kotaraja Community Health Center working area is 11 depots (30.6%) that do not meet the requirements and 25 depots (69.4%) meet the requirements.

Sanitation of Equipment and Processing of Refill Drinking Water Depots

Table 3. Drinking Water Refill Depot Equipment for the Kotaraja Public Health Center Working Area, Jayapura City in 2023

No	Assessment Items	TMS		M.S		Amount	
		N	%	n	%	n	%
1	The equipment used is made from food grade material	0	0	36	100	36	100
2	Microfilters and disinfection equipment are still in use/not expired	16	44.4	20	55.6	36	100
3	Raw water reservoirs must be covered and protected	0	0	36	100	36	100
4	Clean the container or gallon before filling	0	0	36	100	36	100
5	Containers/ gallons filled with drinking water must be given directly to consumers and must not be kept in the DAM for more than 1 x 24 hours.	0	0	36	100	36	100
6	Carrying out a reverse washing system (back washing) regularly replaces the macro filter	14	38.9	22	61.1	36	100
7	There is more than one micro filter (μ) with tiered sizes	0	0	36	100	36	100
8	There is sterilization equipment, in the form of ultraviolet and/or ozonation and/or other disinfection equipment that functions and is used correctly	5	13.9	31	86.1	36	100
9	There are bottle (gallon) washing and rinsing facilities	0	0	36	100	36	100
10	There are facilities for filling bottles (gallons) in a closed room	0	0	36	100	36	100
11	New clean bottle caps available	0	0	36	100	36	100

Table 3 shows that the condition of equipment that meets the absolute requirements from 36 depots or 100% meets the requirements is that the equipment used is made from food grade materials, the raw water reservoir must be closed and protected, the container or gallon is cleaned before filling, the container/gallon has been filled with drinking water must be given directly to consumers and must not be stored in the DAM for more than 1 x 24 hours, there is more than one micro filter (μ) in tiered sizes, there are bottle washing and rinsing facilities (gallons), there are bottle filling facilities (gallons).) in a closed room and new, clean bottle caps are available. The condition of the equipment that partially meets the requirements is that the microfilter and disinfection equipment have expired in 20 depots (55.6%), do not carry out a reverse washing system (backwashing), regularly replace the macro filter in 22 depots (61.1%) and sterilization equipment, in the form of ultraviolet and or ozonation and/or other disinfection equipment did not function and was used incorrectly in 31 depots (86.1%).

Table 4. Conditions, Requirements, and Processing of Drinking Water Refill Depot Locations in the Working Area of the Kotaraja Health Center, Jayapura City in 2023

No	Assessment Items	N	%
1	Not eligible	4	11.1
2	Qualify	32	88.9
Amount		36	100

The results in Table 4 show that the condition of the equipment at 36 refilled drinking water depots in the Kotaraja Community Health Center working area is 4 depots (11.1%) that do not meet the requirements and 32 depots (88.9%) meet the requirements.

Quality of Physical Refill Drinking Water

Table 5. Physical Quality of Drinking Water at the Drinking Water Refill Depot in the Kotaraja Public Health Center Working Area, Jayapura City in 2023

No	Assessment Items	TMS		M.S		Amount	
		n	%	n	%	n	%
1	Smell	3	8.3	33	91.7	36	100
2	Color	0	0	36	100	36	100
3	Flavor	7	19.4	29	80.6	36	100
4	Murky	0	0	36	100	36	100

Table 5 shows that the quality of drinking water from the results of processing and processing of sanitation equipment at drinking water depots from observations was found to meet the absolute requirements, namely colorless and cloudy water (100%), while some of the conditions that met the requirements were odorless water in 33 depots (91.7%) and tasteless water in 29 depots (80.6%).

Table 6. Conditions, Requirements, and Processing of Drinking Water Refill Depot Locations in the Working Area of the Kotaraja Health Center, Jayapura City in 2023

No	Assessment Items	N	%
1	Not eligible	7	19.4
2	Qualify	29	80.6
Amount		36	100

The results in Table 6 show that the physical condition of drinking water from equipment sanitation and processing results is that 7 depots (19.4%) do not meet the requirements and as many as 29 depots (80.6%) meet the requirements.

DISCUSSION

Place for Drinking Water Quality at the Refill Drinking Water Depot

The research results showed that the condition of the 36 refilled drinking water depots in the Kotaraja Community Health Center working area was 11 depots (30.6%) that did not meet the requirements and 25 depots (69.4%) met the requirements. Conditions that meet the 100% requirements are that the location is free from pollution and disease transmission. Meanwhile, of the other 13 items, most of them meet the requirements, namely strong, safe, easy to clean, and easy to maintain buildings with 24 depots (66.7%), watertight floors, flat, smooth surfaces, not slippery, no cracks, do not absorb dust, and easy to clean. , as well as a fairly gentle slope for 22 depots (61.1%), watertight walls, flat, smooth surface, not slippery, no cracks, does not absorb dust, and is easy to clean, as well as bright and bright colors for 24 depots (66.7%), The roof and ceiling must be strong, rat-proof, easy to clean, not absorb dust, have a flat surface and be light in color, and have a sufficient height of 23 depots (63.9%). Meanwhile, some do not meet the requirements because the drinking water depot has a room made of wood without a ceiling so it easily absorbs dust.

Equipment and Processing Depot at the Refill Drinking Water Depot

The research results showed that the condition of the equipment at 36 refilled drinking water depots in the Kotaraja Community Health Center working area was 4 depots (11.1%) that did not meet the requirements and 32 depots (88.9%) met the requirements. Equipment conditions that meet the absolute requirements from 36 depots or 100% meet the requirements are that the equipment used is made from food grade materials, the raw water reservoir must be closed and protected, the container or gallon must be cleaned before filling, the container/gallon that has been filled with drinking water must be immediately given to consumers and may not be stored in the DAM for more than 1 x 24 hours, there is more than one micro filter (μ) in tiered sizes, there are bottle (gallon) washing and rinsing facilities, there are bottle (gallon) filling facilities in a closed room and New clean bottle caps available.

Physical Quality of Drinking Water

The research results obtained showed that the physical condition of drinking water as a result of equipment sanitation and processing, there were 7 depots (19.4%) that did not meet the requirements and 29 depots (80.6%) met the

requirements. The quality of drinking water from the process and processing of sanitation equipment at drinking water depots from observations was found to meet the absolute requirements, namely colorless and cloudy water (100%) while some of the requirements were 33 depots (91.7%) that met the requirements, namely odorless water. and tasteless water in 29 depots (80.6%).

CONCLUSION AND RECOMENDATION

Conclusion

The sanitary conditions of the 36 refill drinking water depots in the Kotaraja Community Health Center working area were 11 depots (30.6%) that did not meet the requirements and 25 depots (69.4%) met the requirements. The sanitary condition of equipment at 36 refilled drinking water depots in the Kotaraja Community Health Center working area is 4 depots (11.1%) that do not meet the requirements and 32 depots (88.9%) meet the requirements. The physical condition of drinking water as a result of equipment sanitation and processing, there are 7 depots (19.4%) that do not meet the requirements and as many as 29 depots (80.6%) meet the requirements.

Recomendation

For the Health Service Prepare a sanitation facilities program to check the quality of drinking water by preparing health resources to monitor the quality of drinking water according to standards set for human needs. The Community Health Center provides training to DAMIU owners to increase knowledge about hygiene, sanitation, and proper and correct management of DAMIU. DMAIU owners must replace equipment according to expired standards for existing equipment. The community must participate in maintaining the quality of drinking water by providing input to DAMIU owners if they find sanitation conditions or drinking water quality that do not meet the requirements of DAMIU owners.

FURTHER STUDY

This research still has limitations, so it is necessary to conduct further research on the topic of Sanitation and Physical Quality of Refill Drinking Water Depots in the Work Area in order to perfect this research and increase insight for readers.

ACKNOWLEDGEMENT

I would like to express my deepest thanks to the faculty of public health, at Cenderawasih University. Thank you to all the lecturers and staff of the Faculty of Public Health, Cenderawasi University. Thank you to all the owners of drinking water depots in the working area of the Kotaraja Community Health Center who are willing to be part of this. In this research, hopefully, the results of such research can provide great benefits for the development of science and society at large.

REFERENCES

- Nurjannah, L., & Novita, DA (2018). TESTING FOR COLIFORM BACTERIA AND *Escherichia coli* in drinking water refills and well water in Cirebon Regency. *Indonesian Journal of Natural Sciences*, 60-68.
- Agustina, Y. (2022). Analysis of Sekanak River Water Quality Based on Physical Parameters. *Journal of Physics and Applied Research (JUPITER)*: Vol. 4 No. 1 (2022)
- BPS Papua, (2017). Papua in Numbers. <http://www.bps.go.id>. accessed 20 November 2023.
- BPS. (2022). Percentage of Households by Province, Region Type and Source of Adequate Drinking Water (Percent), 2020-2022. <https://www.bps.go.id/indicator/29/854/1/percentase-of-households-by-province-type-region-and-source-of-decent-drinking-water.html>.
- Concerned, B., Adriani, R. (2008). Hygiene Sanitation Refillable Drinking Water Depot in Tanjung Redep District Berau Regency, East Kalimantan. *Environmental Health*, 4(2), 81-88.
- Indonesian Ministry of Health. (2022). Handbook of Guidelines for Procedures for Filling in the Registration Number in the Sanitation Hygiene Worthy Certification (SLHS) Logo. Jakarta: Republic of Indonesia Ministry of Health.
- Kuswanto, Heri, S. (2013). Microbiological Examination of Refill Drinking Water in the Kuala Subdistrict, Nagan Raya Regency. Teuku Umar University, West Aceh.
- Mawarni, EDA, & Moesriati, A. (2021). Water Depot Production Quality Study Drink Refill Genteng District, Surabaya City using the Failure Mode and Effect Analysis (FMEA) Method. *ITS Engineering Journal*, 10(2). <https://doi.org/10.12962/j23373539.v10i2.64156>
- Mila, W (2022). Hygiene and Sanitation of Refillable Drinking Water Depots in Banyuwangi District, Banyuwangi Regency, East Java: Descriptive Study. *Ikesma Journal* Volume 16 Number 1 March 2020.
- Puspitarini, R. (2022). Raw Water Quality for Refill Drinking Water Depots (Case Study at Angke Tambora Refill Drinking Water Depot). *Impact Journal*. Vol 19, No 1 (2022). <http://jurnaldampak.ft.unand.ac.id>.
- Raksanagara, A. S, Fitriyah, S., Afriandi, II., Sari, SYI (2018). Internal and External Aspects of Production Quality of Refillable Drinking Water Depots: Qualitative Study in Bandung City
- Regulation of the Minister of Health of the Republic of Indonesia Number 43 of 2014. Hygiene Sanitation of Drinking Water Depots
- Tisna, A A. (2021). Review of Microbiological Parameters on Drinking Water Quality at the Refill Depot in Klojen, Malang City. *Enviro Journal*. Environmental Engineering Study Program - ITN Malang.
- Walangitan, Maria R, Margareth Sapulete, Jane Pangemanan. (2016). Description of the Quality of Drinking Water from Refillable Drinking Water Depots in Ranotana-Weru Subdistrict and Karombasan Selatan Subdistrict According to Microbiological Parameters', *Journal of Community and Tropical Medicine*. 2016; Vol. IV (7) : 40-55