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Perceptions of Sanitation Hygiene Refill Drinking Water
Depot in The Region of IndonesiaPercepciones sobre el depósito de agua potable para recarga de higiene
en el saneamiento en la región de IndonesiaEndang Purnawati Rahayu^{1a*}, Herniwanti Herniwanti^{2a}

SUMMARY

Introduction: Refill drinking water depots are in great demand in society because the price of drinking water is relatively lower. This condition showed that the drinking water quality in depot managers needs more attention. Sanitation hygiene of drinking water refill depots is considered to reduce the factors that cause contamination of drinking water. This study aimed to analyze the sanitation of refill drinking water depots. **Methods:** This study used an analytical-qualitative design. The subjects of this study were seven owners of refill drinking water depots. Data analysis in this study was carried out in data reduction, data presentation, and conclusion drawing stages. The data were validated by triangulation and triangulation methods. **Results:** The results showed that the refill drinking water depot still did not meet the sanitation hygiene

requirements, the refill drinking water depot equipment met sanitation hygiene standards but had not been maximally maintained, the refill drinking water depot handlers did not meet the sanitation, raw water, and water hygiene requirements. The drinking depot drinking water refill did not meet the hygiene and sanitation requirements.

Conclusions: The hygiene and sanitation of the refill drinking water depot have not met the requirements according to the minister of Health Number 43/2014. The public health services need to supervise and conduct training related to the policy of refilling drinking water depots, and depot owners need to apply sanitation and personal hygiene.

Keywords: Drinking water, equipment, handlers, hygiene sanitation, place, raw water.

RESUMEN

Introducción: Los depósitos de agua potable de recarga tienen una gran demanda en la sociedad debido a que el precio del agua potable es relativamente más bajo. Esta condición mostró que la calidad del agua potable en los administradores de depósitos necesita más atención. Se considera que la higiene sanitaria de los depósitos de recarga de agua potable reduce los factores que provocan la contaminación del agua potable. Este estudio tuvo como objetivo analizar el saneamiento de los depósitos de agua potable de recarga.

Métodos: Este estudio utilizó un diseño analítico-qualitativo. Los sujetos de este estudio fueron siete

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propietarios de depósitos de agua potable de recarga. El análisis de datos en este estudio se llevó a cabo en las etapas de reducción de datos, presentación de datos y elaboración de conclusiones. Los datos fueron validados por métodos de triangulación y triangulación.

Resultados: Los resultados mostraron que el depósito de agua potable de recarga aún no cumplía con los requisitos de higiene del saneamiento, el equipo del depósito de agua potable de recarga cumplía con los estándares de higiene del saneamiento pero no se había mantenido al máximo, los manipuladores del depósito de agua potable de recarga no cumplían con los requisitos de saneamiento, crudo requisitos de agua e higiene del agua. La recarga de agua potable del depósito de agua potable no cumplía con los requisitos de higiene y saneamiento.

Conclusiones: La higiene y saneamiento del depósito de agua potable de recarga no han cumplido con los requisitos según el ministro de Salud Número 43/2014. Los servicios de salud pública deben supervisar y realizar capacitaciones relacionadas con la política de recarga de los depósitos de agua potable, y los propietarios de los depósitos deben aplicar el saneamiento y la higiene personal.

Palabras clave: Agua potable, equipos, manipuladores, higiene saneamiento, lugar, agua cruda

INTRODUCTION

Drinking water is essential for human life (1,2). To provide drinking water, refill drinking water depots must meet sanitation and water quality standards protected from contamination or exposure to microbiologists (3). Hence, the sanitation conditions of the depot are significant and can affect the quality of the water in the depot. The performance of the drinking water in Indonesia is still considered low compared to other countries in Southeast Asia, and only about 50 % of Indonesia's population has access to drinking water (4). The tendency of people in Indonesia to consume drinking water is enormous. The use of refilled drinking water is in second place (21.0 %). Protected dug wells are first (22.5 %), and drilled/pumped wells are third (12.8 %). The fourth place is piped water (11.9 %). Fifth place is bottled drinking water (9.7 %), and the rest uses protected springs, unprotected dug wells, unprotected springs, and 22.5 % rainwater reservoirs (5).

Refill drinking water depot is an alternative to fulfilling the community's water needs. It is supported by the home industry business conducted by the community by processing raw water into drinking water. Then, it can be sold to the public. This drinking water can be obtained at the depot at a relatively low price compared to bottled water. Because of this, many people consume refilled depot water, and many people open up business opportunities. This condition needs special attention because drinking water depots are prone to contamination caused by some factors. For example, location factors, presentation, and containers were carried out openly using refillable drinking water bottles. Besides that, coliform bacteria in drinking water can impact environmental health. Therefore, the drinking water depots need to test the quality of drinking water products to ensure the quality of drinking water produced following the Ministry of Health Number 492/Menkes/Per/IV/2010 concerning water quality requirements (6).

The refill drinking water depot aims to create a healthy community because it can expand clean water reach. However, refill drinking water depots are problematic when many entrepreneurs open them with very tight competition. Moreover, water quality is not a priority, especially with business interests that only want big profits (7). Therefore, paying attention to sanitation hygiene at refill drinking water depots. It aims to reduce or eliminate the factors that cause contamination of drinking water and the facilities used for processing, storing, and distributing drinking water. Sanitary hygiene of refill drinking water depot includes place, equipment, and operator variables (8).

Based on the results of observations made by researchers in the field, most depots did not have proper hygiene and sanitation certificates or regular drinking water quality testing. This condition can lead to resignation from the community and pose a risk to public health if consumed continuously. Unfortunately, there are still many sanitation depots that do not meet the requirements. So with this condition, researchers were interested in conducting this research. This study aimed to analyze the place's hygiene, equipment, and handlers at the drinking water depot.

METHODS

This type of research was qualitative analytical design. The informants were based on the saturated sampling technique, including seven depot owners of refill drinking water. The variables included the place, equipment, handlers, raw water, and refill drinking water depot. The instruments used in this study were interview guidelines and checklists. We were collecting data by conducting interviews with informants and observations. Each variable was asked to informants using a checklist and interview guidelines. When conducting research, the researchers directly observed using a checklist. Analysis of the data in this study used the stages of data reduction, data presentation, and concluding. Triangulation was carried out using a source to maintain the validation of the data collected.

RESULTS

The research area showed that has refill drinking water depots located in one of the sub-districts in Riau Province, Indonesia, with seven refill drinking water depots (Table 1).

The variable components studied in this study were sanitation hygiene in refill drinking water depots, equipment, handlers, and raw water, and drinking water was adjusted to the Regulation of the Minister of Health of the Republic of Indonesia Number 43/Menkes/2014 concerning Hygiene Requirements for Drinking water Depot sanitation. Based on Table 2 obtained that several

Table 1
Demography of Research Location (n=7)

Characteristics	N	%
Width Area	1.128.928 Ha	
Climate	Tropical	
Source of Raw Water		
Hill Water	1	14.2
Boreholes	2	28.7
Dug well	4	57.1
Distance of Raw Water Source		
< 20 km	4	57.1
20-50 km	1	14.2
> 50 km	2	28.7
Distance from Raw water		
< 20 km	4	57.1
20-50 km	1	14.2
> 50 km	2	28.7

variables can describe refilled drinking water depots, including where the place does not meet sanitation hygiene. For example, the depot floor was muddy and uneven, slippery and cracked. In addition, there were no trash can with a lid, no handwashing area with soap and running water, no tissue and hand wipes, no particular room for processing, storage, provision, and waiting room for visitors/consumers, and no bulkhead. The drains at the four depots were also open, and the wastewater was not flowing smoothly. In addition, refill drinking water put into gallons did not have a seal and label.

Table 2
Sanitary hygiene triangulation matrix for refillable drinking water depots

Variables	Conclusion
Place	The refill drinking water depot does not meet the sanitation hygiene standards
Equipment	The refill drinking water depot equipment has met the sanitary hygiene standards but has not been maintained optimally
Handler	The handlers of the refilled drinking water depot do not meet the sanitation hygiene requirements
Raw and Drinking Water	Raw water and drinking water from refilled drinking water depots do not meet sanitary hygiene requirements

The second variable is the depot equipment is good. However, its use has not been maximized. The condition of the depot equipment describes the physical condition and maintenance of the equipment used. Reservoir used and also the disinfectant used by the depot. There were still depots that stored refilled water at the drinking water depot for more than 24 hours. And the cleaning of gallons that were still not done before filling drinking water.

The third variable is that the handlers of refilled drinking water depots do not meet sanitation hygiene. This is because the workers/handlers did not have a special certificate regarding the hygiene and sanitation of drinking water depots. They had never carried out periodic checks even though they were in good health and did not wash their hands before doing work. Hand washing, although it appears to be a light activity and is often overlooked, has proven to be quite effective in preventing contamination of food and beverages. Handwashing with soap and rinsing will remove many of the microbes present on the hands. The frequency of handwashing is adjusted to the needs. And this should be done before filling the gallon of water.

The fourth variable is that raw water and drinking water in the refilled water depot do not meet sanitation hygiene. This is because the source of raw water came from dug wells and drilled wells, so pipes were used to flow to the depot tank. Therefore, it is necessary to re-examine whether the raw materials originating from the area are suitable for use as raw materials to be processed into drinking water. The primary raw material that should be used is water taken from sources with guaranteed quality, which is protected from chemical and microbiological contamination that is damaging/disturbing health and is checked regularly for organoleptic (smell, taste, color), physics, chemistry, and microbiology. However, the depot also did not have proper hygiene and permission for water sources, and the measurement results were still found in 4 depots containing coliform bacteria that do not meet health requirements. The state water tanks were made of materials that are harmful to health.

DISCUSSION

From the results of the study, it was found that the drinking water depots as a whole still did not meet the hygiene and sanitation requirements following the Decree of the Minister of Health Number 492/Menkes/Per/IV/2010 concerning the criteria for drinking water quality and the Decree of the Minister and Trade of the Republic of Indonesia Number 651/MPP/Kep/10 /2004 concerning Technical Requirements for Drinking Water Depots and their Trade. The condition of the drinking water depot that does not meet the sanitation hygiene requirements is supported by the results of previous studies that the physical condition of the refill drinking water depot that does not meet the needs will affect the quality of drinking water from the depot's processing (9). The refill drinking water depot building must be in a location that is free from pollution, such as a dumping ground for sewage and garbage, the accumulation of used goods, or hazardous and toxic materials. Following the results of previous studies, the condition of the walls of the refill drinking water depot building must meet the requirements of waterproof materials, flat, smooth, non-absorbent dust, and easy to clean surfaces (10). Wall colors are bright and clear, always in clean packaging, not dusty, and free from hanging clothes. This is in line with the research results that refill drinking water depots have substantial, safe, easy-to-clean, and easy-to-maintain buildings.

Processing of drinking water at refill drinking water depots is not entirely done automatically to affect the quality of the water produced, so standard equipment plays a significant role in processing raw water into drinking water. The condition of the equipment in the drinking water treatment process is good and meets the requirements will produce good drinking water as well. From the study results, it was found that the refill drinking water depot equipment had met the sanitary hygiene requirements. This is supported by the results of research in Indonesia, which states that maintenance of drinking water depot treatment equipment can be carried out periodically to affect the processed

drinking water quality, which is also closely related to the behaviour of officers at drinking water depots (11). Less optimal processing can cause bacterial contamination (7,12). Therefore, to support the water treatment process, it is necessary to clean the refill drinking water depot so that the water produced is free from bacteria. Cleaning the drinking water tank and water filter is carried out regularly, and flushing the gallons needs to be undertaken to reduce contaminants in the gallons because the refilled water packaging is contaminated as a medium for various germs that cause various diseases such as diarrhea.

In addition to other sanitation aspects that are very influential on the drinking water treatment process, there are elements of workers, namely human resources, who behave in a clean and healthy life. This becomes very important because it is related to the impact caused by the presence of pollution and contamination caused by the officers themselves. Therefore, personal hygiene in the drinking water treatment process must be considered to ensure the quality and safety of the drinking water produced and prevent the spread of disease through the water. This is in line with the results of previous studies which stated that the internal aspect that greatly influences the refill drinking water depot is human resources, if resources are low, it can cause the processing process not to comply with standards (13). Therefore, the key to the refill drinking water depot treatment system is the health quality of the workers who undertake the drinking water treatment process thus as not to pollute drinking water (14).

The results showed that none of the raw water and drinking water refilled drinking water depots met the requirements of physical fitness and did not meet the health requirements according to the Regulation of the Minister of Health Number 416/Menkes/Per/IX/1990 concerning Health Requirements and Clean Water Quality Supervision and Regulation of the Minister of Health Number 492/Menkes/Per/IV/2010 concerning requirements for drinking water quality. Where there are four depots containing coliforms, the spread of these bacteria is from human to human. Through dirty hands, these bacteria are spread by flies and food contaminated with feces. This is in line with the previous theory,

which showed that coliform bacteria in water showed the presence of toxic microbes that were harmful to health (15-17) no total coliform, and minimum pressure heads of 1 bar at any house connection of the customers. Local water company Malang has 85 district meter areas. The higher the level of contamination with coliform bacteria, the higher the risk of the presence of other pathogenic bacteria (18). Inadequate sanitation facilities can cause the presence of coliforms in water, and depot owners who ignore personal hygiene and drinking water treatment facilities that are used are rarely replaced or cleaned. Other things that can cause coliforms are also influenced by inadequate depot places that allow contamination to occur, according to the Ministry of Health of the Republic of Indonesia (19). And this is in line with the research results in Indonesia that several factors that can affect the quality of drinking water include raw water, depot conditions, operator hygiene, and handling of buyer containers (20). This is closely related to the handling of the gallons brought by the buyer, which also affects the quality of the water in it. Even though the water produced is of high quality, if there is no more attention to the gallon container as a place for refilling water, it will contaminate the water produced.

CONCLUSION

The refill drinking water depot does not meet the proper sanitation and hygiene standards. Therefore, it is necessary to have the role of relevant agencies such as the health office and public health center supervise the refill drinking water depots and conduct training to increase knowledge for refill drinking water depot owners related to sanitation hygiene.

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