

# WATER SANITATION PROGRAM: HEALTH CARE PROFESSIONAL AND FAMILIES' PERCEPTION

<sup>1</sup>Nicanor M. Domingo III, <sup>2</sup>Rouneil D. Dela Cruz

<sup>1,2</sup>College of Nursing and Allied Medical Sciences, Wesleyan University-Philippines,  
Cabanatuan City, Philippines 3100

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**Abstract:** Water is a basic component of humans accounting to majority of body mass. But the water we sip comes from a chemically-treated source, whereas a large number of public still uses deep wells as their drinking water. This study aimed to determine the implementation of Water Sanitation Program (WSP) of the Department of Health in six Rural Health Units in Cabanatuan City as this encompasses public health concern wherein diarrheal diseases and dehydration still conclude as leading causes of mortality in the Philippines up to date. Quantitative design was employed, specifically descriptive-correlation method. A two-part questionnaire was the main tool which was subjected to pilot testing. Items were self-constructed in guide of the Philippine National Standards for Drinking Water of 2007 and PD 856 or the Code of Sanitation. It was found out that health workers and the said families describe WSP's provision of approved water supply facilities, access to safe and potable drinking water, water quality and monitoring surveillance, and waterworks and well construction as effective since their responses were verbally-described as often. Health education about Halazone tablets, proper distancing of deep well to likely source of contamination and regular bacteriological analysis of drinking water were found to be inadequate. Correlation analysis revealed that health care workers' length of service ( $p=0.6725$ ) and age ( $p=0.5366$ ) have strong significant relationship with their roles on the implementation of WSP while health care workers gave their performances higher descriptions than the family-respondents.

**Keywords:** deep well, water sanitation, drinking water, water quality, potable water.

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## I. INTRODUCTION

Even before the current decade, Cabanatuan City Water District (CCWD) had anticipated that deep water sources would soon be inadequate. Consistent with its vision of anticipating consumer's future needs, thorough studies for other water sources were made. As a result of these studies for the past five years or so, CCWD has been tapping shallower ground water sources. In contrast to the deep water sources, water from shallower depths contains more minerals and is less soft. Anent to this, they require processing to remove the excess minerals and other impurities to make them safe for human consumption.

Fortunately, rapid development in water processing technology brought down its cost of construction and operation to reasonably affordable levels. Cabanatuan City Water District has availed of this technology – small filtration systems that are installed to process water from shallow wells. It enabled the agency to drill shallow wells right beside its deep wells, process the resultant water and blend them with the product of the deep wells. <sup>[7]</sup>

The purpose of this study was to disseminate information to the public regarding the role of health care workers in water sanitation, thus contributing to the proper consumption of safe and clean water. It also divulges facts that may help the people understand why it is important to stress out water sanitation to health. It may also help the health care providers for the implementation of water sanitation in the communities. Access to clean water and effective sanitation has a catalytic

effect on many aspects of human development, being essential for a healthy population and environmental sustainability. Also as a priority agenda of the Philippine Council for Health Research and Development and through the Millennium Development Goals, this study was persuaded.

## II. LITERATURE REVIEW

A water resource system is a mixture of water control facilities and/or environmental elements and it requires system wide decision-making and control that considers the integrated viewpoint. This is easier said than done, and a comprehensive or “holistic” view of managing water resources systems is still beyond our grasp, but with modern information technologies, we are getting closer<sup>[3]</sup>. The liquid freshwater which we consume exists on our Earth’s crust either as surface water or as groundwater. This groundwater can be in the form of a shallow water table that rather quickly imitates changing levels of xenobiotics at the surface, or as much deeper aquifers that acquire surface contaminants more slowly, but just as surely nonetheless. An aquifer is a layer of rock or soil capable of holding large amounts of water.<sup>[6]</sup>

Fresh water distribution to local areas and removing human waste has been practiced at least since ancient times. In those times, the ruins of aqueducts are utilized by Europeans to deliver fresh water to far places. Ridding cities of human waste has been more difficult, the sewer that were used until the mid-nineteenth century not much more than large, open cesspools. Amidst the knowledge of microorganisms, it was realized that some disease are associated with the use of water or water supplies. As early as 330 B.C., Alexander the Great and his armies use boiling system to their soaking water, a habit that probably contributed to his huge success. Certainly, many battles have been lost over the years as a result of waterborne disease that decimated the combatants. Years are the cholera-causing *Vibrio cholera* was identified. It was serious that cholera epidemics were associated with drinking water.

The desire for clean, clear water led to the use of a sand filtration system in London and elsewhere in the early nineteenth century. Late in that century, Robert Koch showed that only this kind of filtration yield clear water, it also removed more than 98% of bacteria from the water. In the early 1800’s, Edwin Chadwick implored on how wastes could be removed. His idea to construct system of narrow, smooth ceramic pipes through which water could be flushed along with solid waste materials. System would carry the waste materials away from the occupied part of the city. There, he hoped to collect the waste materials and turn them into fertilizer to sell to customers. The system he envisioned required the installation of new sewer and sewer pipes along with pumps to deliver water under pressure to houses. With the water the water under pressure and smooth narrow pipes, the system could be kept well flushed.<sup>[4]</sup>

Drinking water is vital. Water is one of the most important reactants in metabolic or chemical reactions in the body and promotes growth, tissue repair and maintenance, body temperature, and pH balance. Water is both a food and nutrient. Structurally, water is comprises the majority of our human body. Diarrheas and other waterborne diseases still rank among the leading causes of morbidity in the Philippines, so in 2007, the Department of Health made the Administrative Order 2007-0012 or the Philippine National Standards for Drinking Water 2007 for they believed that access to safe drinking water is a basic human right. Inasmuch, the supply of safe water can deter waterborne pathogens and reduces other hazards that could be ingested through contaminated drinking water.<sup>[2]</sup> Before this, PD 856 or the Code of Sanitation was made by the same agency on year 1976. PD 856 encompassed sanitary laws on water supply among Filipino citizens.

Additionally, activities in the Water Sanitation Program (WSP) are responsibilities of nurses such as Health Education – by conducting community assemblies and bench conferences.<sup>[1]</sup> The occupational health nurse, school health nurse and other nursing staff shall impart the need for an effective and efficient environmental sanitation in their places of work and in schools actively participate in the training component of the service like in Food Handler’s Class, and attend training and workshops related to environmental health; assist in the deworming activities for the school children and targeted groups; effectively and efficiently coordinate programs, projects, and activities with other government and non-government agencies ; act as an advocate or facilitator to families in the community in matters of program, projects, and activities on environmental health in coordination with other members of Rural Health Unit (RHU) especially the Rural Sanitary Inspectors; be role models for others in the community to emulate terms of cleanliness in the water, home and surrounding.

### III. METHODOLOGY

Descriptive research under the quantitative design was used. Correlation was also employed. Significant relationships were evaluated between the socio demographic profile of the respondents and their descriptions of the implementation of the Water Sanitation Program and attested further significant difference in the descriptions of the two groups of respondents in the implementation of the said program. Lastly, the researchers were able to identify relevant differences in the implementation of the program concerned in the different RHUs in Cabanatuan City.

The 2-part questionnaire was the main tool used for data gathering. A questionnaire is a series of questions asked to individuals to obtain statistically useful information about a given topic. It is a useful instrument by which statements can be made about specific groups or people and/or entire populations.<sup>[5]</sup> Items were self-constructed with use of different literature sources from *Philippine National Standards for Drinking Water of 2007* and the *Presidential Decree 856 or the Code of Sanitation*. The data gathered were analyzed and interpreted using frequency and percentage distribution, z-test, and Pearson product moment correlation.

A total of 28 HCW-respondents and 377 heads of the family respondents who use deep well as drinking water source were utilized in this study. Table 1 shows the two groups of respondents' distribution in 6 RHUs in Cabanatuan City.

**Table 1: Distribution of the Respondents**

RHU	health care workers		Family Head
	<i>Nurses</i>	<i>sanitary inspectors</i>	
1	2	1	34
2	4	1	41
3	4	1	150
4	5	1	48
5	4	1	17
6	3	1	87
Total	22	6	377

The researchers used total enumeration sampling procedure for HCW-respondents. Therefore, all individuals who would meet the criteria set by the researchers were included in the study. On the other hand, convenience sampling was utilized for the selection of heads of the family respondents.

### IV. RESULTS AND DISCUSSION

#### 1. The Socio-Demographic Profile of Health Care Workers:

Most of the HCWs, 21 or 75.00%, belonged to the 31-35 years old group, 23 or 82.14% belonged to the female, belonged to the married category with a number of 21 or 75.00%; 22 or 78.57% were nurses and 6 or 21.48% were sanitary inspectors, while 14 or 50.00% of the respondents have 6 to 9 years of length of service. Finally, it shows that majority of the HCW-respondents were assigned in RHU 4 with a number of 6 or 21.43% of respondents.

#### 2. The Socio-Demographic Profile of the Heads of the Families using Deep Well:

It was found out that majority of the heads of the families, 195 or 51.72%, belonged to the 41-50 years old group, 92.84% belonged to the male group, married category has 312 or 82.78%; 113 or 29.27% had educational attainment of high school level, 189 or 50.13% of the respondents had Php 7,000.00-8,999.00 family monthly income, and 289 or 76.66%. Majority had no diarrhea in the past six months but important to note that 88 out of 377 families have had it.

#### 3.1. Description of Health Care Workers in the Implementation of Water Sanitation Program in terms of the Provision of Approved Water Supply Facilities in the Community:

The HCWs' description of their roles on the implementation of the Water Sanitation Program in terms of provision of approved water supply facilities in the community got an overall weighted mean of 3.18 which was verbally interpreted as "often". The HCWs check the water facilities often (3.25).

### **3.2. Description of Health Care Workers in the Implementation of Water Sanitation Program in terms of Access to Safe and Potable Drinking Water:**

The HCWs' description of their roles on the implementation of the Water Sanitation Program regarding access to safe and potable drinking water got an overall weighted mean of 3.15, verbally interpreted as “often”. The HCWs suggest the use of *katsa* (clean cloth) and other kinds of strains often (3.17) as also the use of Halazone tablets for water consumption (2.50).

### **3.3 Description of Health Care Workers in the Implementation of Water Sanitation Program in terms of Water Quality and Monitoring Surveillance:**

The HCWs' description of their roles on the implementation of the Water Sanitation Program in terms of water quality and monitoring surveillance got an overall weighted mean of 2.95, verbally interpreted as “often”. The HCWs conduct systematic program of sanitary inspection often (3.08); so as conducting spot testing of water samples from different water supply system (2.83) and assessing the presence of their needed facilities (2.75); it is seldom for them to involve health officials for disease surveillance and updating their record (2.42).

### **3.4. Description of Health Care Workers in the Implementation of Water Sanitation Program in terms of Waterworks/Water System and Well Construction:**

The HCWs' description of their roles on the implementation of water sanitation program in terms of waterworks or water system and well construction was rated with an overall weighted mean of 3.10 which was verbally interpreted as “often”. They often promote proper well construction (3.17), submit water sample upon completion of construction/maintenance or installation and testing of wells (3.00) and advise community people that sanitary well should be 25 meters away from likely source of contamination such as restrooms (3.00). But seldom have they submitted laboratory analysis to determine the bacteriological content of water supply sources (2.40) from private deep well owners.

### **4.1. Description of the Heads of the Families in the Implementation of Water Sanitation Program in terms of the Provision of Approved Water Supply Facilities in the Community:**

The heads of the families' description of the implementation of the Water Sanitation Program in terms of provision of approved water supply facilities in the community got an overall weighted mean of 2.81 which is verbally interpreted as “often”. The HCWs check our water facilities often (3.40).

### **4.2. Description of the Heads of the Families in the Implementation of Water Sanitation Program in terms of the Access to Safe and Potable Drinking Water:**

The heads of the families' description of the implementation of the Water Sanitation Program in terms of access to safe and potable drinking water got an overall weighted mean of 2.83, verbally interpreted as “often”. Only 104 or 27.58% of them use of *katsa* (clean cloth) and other kinds of strains, while only 6 or 1.59% use Halazone tablets for water purification (2.50).

### **4.3. Description of the Heads of the Families in the Implementation of Water Sanitation Program in terms of Water Quality and Monitoring Surveillance:**

The heads of the families' description of the implementation of the Water Sanitation Program in terms of water quality and monitoring surveillance got an overall weighted mean of 2.26 which was verbally interpreted as “seldom”. They said that HCWs seldom conduct spot testing of water samples from their deep wells (2.83).

### **4.4. Description of the Heads of the Families in the Implementation of Water Sanitation Program in terms of Waterworks/Water System and Well Construction:**

The heads of the families' description of the implementation of the Water Sanitation Program in terms of waterworks or water system and well construction got an overall weighted mean of 2.87, verbally interpreted as “often”. They said that HCWs often promote proper well construction (3.00), they also know that sanitary well should be 25 meters away from likely source of contamination such as restrooms (3.45). It is noted that only 12 or 3.18% of families submit water samples for bacteriological analysis regularly (which is once every three months), while 51 or 13.52% submit water sample annually for bacteriological and chemical analysis.

**5. Relationship between the Socio-Demographic Profile of the Respondents and their Description of the Implementation of Water Sanitation Program:**

**Table 2: The Relationship between Socio-Demographic Profile of the HCWs and the Implementation of Water Sanitation Program**

HCWs	Description of the Implementation of Water Sanitation-value @ n = 28	Interpretation
Age	0.536627117*	High significant relationship
Sex	A	Cannot be computed because @ least one of the variables is constant
Civil Status	0.481903302*	High Significant relationship
Educational Attainment	-0.28366	No Significant Relationship
RHU Position	-0.06564	No Significant Relationship
Length of service	0.672583001**	Very High significant relationship
RHU Affiliation	-0.03524	No Significant Relationship

\*correlation is significant @ 0.05 level

\*\* correlation is significant @ 0.01 level

Statistical analysis revealed that length of service had a very high significant relationship with the description of the HCWs of their roles on the implementation of Water Sanitation Program. The respondents' age also had high significant relationship with their role description.

**6. Difference in the Descriptions of the Two Groups of Respondents the Implementation of Water Sanitation Program**

**Table 3: Difference in the Descriptions of the Two Groups of Respondents the Implementation of Water Sanitation Program**

Z-test	Heads of the Family using deep well	HCWs
Mean	2.81	3.10
Variance	0.201345	0.144867
N (Total number of population)	377	28
Hypothesized Mean Difference	0	
Z-test	-2.2777*	

The variation of the values of this variable was 0.144867 in HCWs and 0.201345 for the heads of the families using deep wells. A significant difference in the description of the two groups of respondents on the implementation of Water Sanitation Program was noted.

**V. CONCLUSIONS**

The HCWs described the implementation of Water Sanitation Program as effective but some shortfalls were noted such as they often check the status of deep wells so as to promulgate health education and promotion activities to families who use deep well as a source of drinking water. The use of simple straining materials such as *katsa*, use of Halazone tablets, conducting systematic programs and involve health officials for disease surveillance for proper recording and reporting of diarrheal cases to initiate public action if necessary were inconsistent.

Health care workers seldom submit laboratory analysis to have water supply system for bacteriological analysis. It is also noted that HCWs often advice community to install deep well 25 meters away from source of contamination which should be a vital health education to minimize water contamination.

The longer the length of service, the more effective they were in the implementation of Water Sanitation Program. Significant difference in the description of the two groups of respondents on the Implementation of Water Sanitation Program was noted. The HCWs gave their performances higher descriptions than the other group of respondents.

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