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HAND HYGIENE KNOWLEDGE, PRACTICE AND FACILITIES UTILIZATION OF PUPILS IN BATANGAS CITY, PHILIPPINES: BASIS FOR PROPOSED HAND HYGIENE ACTIVITIES

Mardes M. Asilo RN, PhD

Associate Professor College of Nursing and Midwifery, University of Batangas, Philippines
mardes.asilo@ub.edu.ph

Jennifer Berberabe RN, MAN

Assistant Professor College of Nursing and Midwifery, University of Batangas, Philippines
jennifer.berberabe@ub.edu.ph

Aquilina De Ramos RN, MAN

Assistant Professor College of Nursing and Midwifery, University of Batangas, Philippines
aquilina.deramos@ub.edu.ph

Abstract

This study assessed the hand hygiene knowledge, practice and facilities utilization of pupils in Batangas City, Philippines during academic year 2016-2017. Using a self-structured questionnaire, the researchers selected one thousand one hundred eighteen (1,118) pupils as participants in this research. They analyzed the responses of the pupils through the use of frequency counts, weighted mean, t-test and Analysis of Variance (ANOVA) to determine the difference of responses among grade levels and school type. The study found out school type had the most influence on pupils' learning concepts about hand hygiene as well as its implementation

and the provision of adequate supplies & facilities. Public school pupils showed higher scores in hand hygiene knowledge, practice and facilities utilization as well as greater interest on the proposed hand hygiene activities. These included, among others, conduct of health teaching on proper hand hygiene technique with disease education and preparation of individual hygiene kit for pupils. On the other hand, grade level was determined not to have significant difference on the pupils' know-how in hand cleansing. This is because regardless of the pupils grade level their knowledge, practice and facilities utilization including interest on the suggested hand hygiene health activities remain the same. It is further recommended that school administrators take action on the pupils' interest regarding hand hygiene health activities proposed in the study.

Keywords

Hand Hygiene, Knowledge, Practice, Facilities Utilization, Grade Level, School Type

1. Introduction

Hand hygiene is now regarded as one of the most important elements of infection control activities. In further support to the endeavor of the World Health Organization (WHO) and Centers for Disease Control (CDC), there is commitment to continuously elevate the standards on health practices and reduce if not eliminate the transmission of infection globally. With all ages susceptible to diseases, elementary school-age children are particularly vulnerable to infections. While hand washing is the best method of preventing infections, many elementary schools are housed in buildings that have barriers to effective hand hygiene (Morton & Schultz, 2004). In the Philippines, the Department of Education Order (D O.) No. 56, s. 2009 entitled “Immediate Construction of Water and Hand Washing Facilities in All Schools for the Prevention of Influenza A (H1N1)” and D O. No. 65, s. 2009 entitled “Implementation of the Essential Health Care Program (EHCP) for the School Children” were issued in an effort to institutionalize good health and hygiene practices among students.

Under the EHCP, pupils have been taught simple, basic, and doable health interventions to promote cleanliness and prevent sickness. To expand the EHCP's reach and transform it into a more comprehensive program, the Department has crafted this holistic program for personal health care and environmental sanitation through a set of standards for proper and correct health practices in schools. In crafting this set of guidelines, the Department, in partnership with agencies and stakeholders, hopes to address the gaps in the areas of hygiene and sanitation and

keep more children healthy in school. These Policy and Guidelines shall apply to all private and public elementary and secondary schools nationwide. The school head plays a crucial role in ensuring that the basic requirements and standards of this policy are met.

Besha et.al (2015), the authors reiterated hand washing as especially important for children and adolescents, as these age groups are the most susceptible to infections gained from unwashed hands. Hand washing is like a "do-it-yourself" vaccine—it involves five simple and effective steps: wet, lather, scrub, rinse, and dry to reduce the spread of diarrhea and respiratory illness so one can stay healthy. Regular hand washing, particularly before and after certain activities, is one of the best ways to remove germs, avoid getting sick, and prevent the spread of germs to others. It is quick, it is simple, and it can keep us all from getting sick. Hand washing is a win for everyone, except the germs (Center for Disease Control, 2016).

In the study conducted by B4 brands, most bacteria on one's hands are on the fingertips and under the nails. The number of bacteria on the fingertips doubles after using the bathroom. Damp hands are 1,000x more likely to spread bacteria than dry hands. Only 20% of people dry their hands after washing. Re-usable cloth towels harbor millions of bacteria. Disposable paper towels are the most sanitary means of drying hands. The recommended washing time is 15 seconds. The ideal washing time is 30 seconds. For every 15 seconds spent washing hands, 10 times more bacteria is removed. The average person spends less than 10 seconds washing his/her hands. In addition, 30 seconds of using hand sanitizer kills as much bacteria as 2 full minutes of hand washing.

Hand washing and hand hygiene initiatives greatly reduce the number of absences, sick leaves, and lost productivity. A study of Detroit school children showed that those who washed their hands had 24% fewer sick days due to respiratory illness and 51% fewer sick days due to upset stomach. In China, distribution of soap in primary schools resulted in 54% fewer sick days. The use of hand sanitizer in the classroom resulted in 20% fewer sick days across 16 different elementary schools. Where knowledge and access to materials are not notable barriers, large scale hand washing promotion programs may need more rigor or intensity to improve hand washing behavior (Chase and Do 2012). Moreover, Mansour et. al (2013) found out that lack of soap at a toilet, no towels in the bathroom and sharing a toilet may be more frequently observed among children with diarrhea than among well children.

Besha et. al. (2015) in their research likewise mentioned that proper hand washing also improves learning and teaching processes by reducing absenteeism. Hand washing reduces absenteeism as evidenced by study conducted around the world like 54% (China), 40% (Egypt), 35% (Kenya), 27% (Philippines) and 20% in (Colombia). While a fundamental personal hygiene practice, hand washing is often not done when necessary or is ineffectively done. Hand washing is a learned behavior. To be effective, proper hand washing must be learned, preferably as a child, so that it becomes a routine habit throughout life. (Scarborough, 2002).

D.O. no. 65, s 2009 stated education and health are interrelated. Academic performance of the pupils and instructional outcomes are determined by the quality of health of the school children. Unhealthy children cannot develop their full potential which may result to high drop-out rates and low academic performance. The health status of pupils in public schools is alarmingly poor. Dental caries, infectious diseases (respiratory tract infections and diarrhea) and worm infestations are the most common hygiene deficiency related infectious diseases in public schools which are due to lack of water and functional sanitary facilities. A research conducted by Loren Murcia in Zapote Elementary School A.Y. 2010-2011 on grade six pupils found out that fever/flu is the most common reason of students for being absent followed by diarrhea. The author recommended that educators should give emphasis on teaching the students on how to take care of their overall well-being, specifically educating students how to avoid communicable diseases by information on how to properly wash the hands. In addition, Ellis (2016) in his study on the effects of absenteeism to the learning performance of fourth year students in a national high school in Batangas City found out sickness such as respiratory and diarrheal diseases can be a factor on absenteeism that must address an urgent action. For these justifications, the researchers find it relevant to pursue this study.

This study aimed to assess the presence of hand hygiene knowledge, extent of its practice and the availability of facilities utilization of the pupils in Batangas City enrolled academic year 2016 - 2017. Likewise, this research identified significant difference in hand hygiene knowledge, practice and facilities utilization of pupils according to grade level and school type. Furthermore, it focused on determining the likely health activities that may be proposed to the school administration based on the interest of the pupils.

1.1 Theory/Concept

The concept of this research is grounded on the hand hygiene technical reference manual by World Health Organization – “5 Moments of Hand Hygiene”, guidelines by Centers for Disease Control – “Clean Hands Save Lives”, implemented program by Philippine Department of Health – “Nationwide Annual Handwashing” and memorandum order of the Philippine Department of Education - “Essential Health Care Program.”

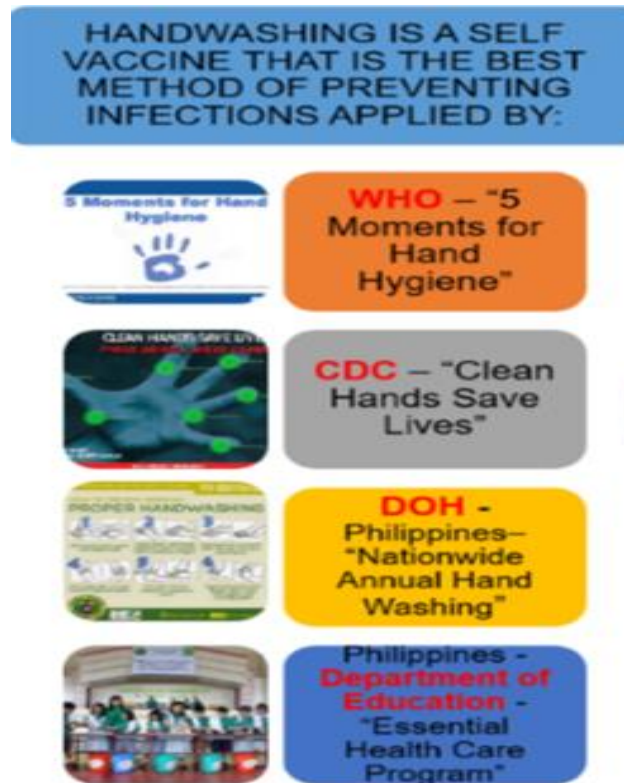


Figure 1: *Conceptual Framework*

2. Methodology

This study used the descriptive research. The intent of this study was to determine the knowledge, practice and facilities utilization in hand hygiene of nine elementary schools in Batangas City, four of which are public schools (funded and controlled by the government) and five are private institutions (independent schools which rely on tuition fees). The private institutions are located in the poblacion area, three have tertiary level of education including graduate school while the remaining two are elementary schools with secondary level. On the other hand, the public elementary schools are situated at the outskirts of the Batangas City East District except for one located on the adjacent municipality. Moreover, this focused only on

grades 4, 5, and 6 pupils primarily because in the cognitive theory developed by Jean Piaget, ages 9, 10 and 11 have already achieved concrete operational thought which marks the beginning of logical thinking while 12 years old onwards has formal thought operations wherein apart from logical thinking, abstract thinking has been established.

A total of 1,118 pupils were obtained as sample size from a total of population of 1,822 enrolled academic year 2016-2017. Moreover, consent for the students' participation was obtained from the principal as well as the research director of applicable academe. The schedule of availability of the pupils provided by the principal's office made convenience sampling the method of choice. All pupils present in the class at the time were invited to participate which enabled us to obtain 61% of the entire population whereas utilizing the sampling size formula with a margin of error estimated at 5% and confidence level of 95% true sample can be gained in 318 number of pupils only. The study utilized a self- made survey questionnaire anchored in the hand hygiene monograph authored by the Joint Commission published by Division of Quality Measurement: The Joint Commission One Renaissance printed in USA, 2009. Batangas City medical health officers who are professional licensed doctors responsible for spearheading and implementing health programs advocated by the Department of Health further validated the questionnaire. Likewise, these physicians are concerned with ensuring that the pupils in Batangas City receive the benefits of the Essential Health Care Program (EHCP) as legislated by D.O 65 s 2009.

The questions were grouped into four distinct areas which are as follows: hand hygiene knowledge, practice, and facilities utilization including proposed hand hygiene health activities for the students. Specific questions revolve on the circumstances students perform hand hygiene, its frequency, likewise the amenities available and health programs of interest focused on hand hygiene promotion. Details of the questions may be gleaned on results and discussion section. The statistical treatment tools used were percentage distribution, weighted mean, T- test and ANOVA to determine the difference and the significance of the differences on the responses made by grades 4, 5 and 6 students including the grouping of the respondents based on school type.

3. Ethical Consideration

The Child and Youth Welfare Code of the Philippines (Presidential Decree 603) were taken into consideration to ascertain the rights of the respondents were upheld and protected. Foremost, the questionnaire was validated by a team of medical doctors from the City Health Office, subsequently were submitted for approval to the principal and the research director if any. During administration of the questionnaires inside the classroom, an atmosphere of non-judgmental, respectful and harmonious attitude were exhibited by the researchers. Each item was explained thoroughly before proceeding to the next allowing opportunities for questions or clarifications. Anonymity is promoted by informing the respondents that writing their name is optional. Likewise, to maintain confidentiality the questionnaires were stored in a secured place accessible to the researchers only.

4. Results and Discussion

4.1 Profile of Selected Public and Private Elementary Students

Table 1 shows the profile of the respondents as to grade level. Grade 4 has 355 respondents accounting to 32%, grade 5 has 389 representatives which is 35% and grade 6 has 374 sample size amounting to 33% of the entire population total of 1,118 pupils combination of private and public schools. In connection to gender, the profile of the respondents has more female involving 609 pupils constituting 54% while the remaining 509 are male pupils making up 46% of the whole population. Delineating the school type, majority of the pupil respondents are from the private schools consisting of 64% and the remaining 399 came from public schools representing 36% of the entirety. The respondents' living condition predominantly is residing with parents with 992 pupils or 89% of the total population; some reside with relatives at 122 or 11% and 4 respondents claimed they live with friends. The family composition is prevalently 4-6 family members as expressed by 723 students quantified as 65%, some 219 or 19% of the pupils stated 7 and more family members, and 175 or 16% asserted family members of 1-3.

Table 1: Profile of Selected Public and Private Elementary Students

Grade Level	Number	Percentage
4	355	32%
5	389	35%
6	374	33%
Total	1,118	100%
Gender	Number	Percentage
Male	509	46%
Female	609	54%

Total	1,118	100%
School Type		
Public	399	36%
Private	719	64%
Total	1,118	100%
Living Condition		
Family	992	89%
Relatives	122	11%
Friends	4	0%
Total	1,118	100%
Members of the Family		
1-3	175	16%
4-6	724	65%
7 and more	219	19%
Total	1,118	100%

The child's age, gender, grade level, socioeconomic index, access to hygiene and sanitary facilities, and prior knowledge of hygiene practice were significantly associated with the outcomes such as absenteeism, infections, knowledge, attitudes, and practices (Joshi & Amadi, 2013).

4.2 Knowledge, Practice and Facilities Utilization in Hand Hygiene

In terms of knowledge, Table 2 reflects that grades 4, 5 and 6 pupils from either school type exhibited near values of composite mean ranging from 2.869, 2.888, 2.874 respectively. The values connote that pupils across these grade levels agreed to possess knowledge on hand hygiene which is almost the same and that may be considered high. Moreover, the pupils' almost homogenous composite mean values indicate knowledge on the theoretical principles of hand hygiene as alike among the pupils. Yet, particularly in school type, public school pupils' composite mean for agree is 2.915 which is higher than the value rated by private schools marked at 2.856. This implies that in public schools, pupils claim to acquire higher knowledge on hand hygiene compared to their counterpart pupils from private schools. This may be explained by the fact that public schools adhere rigidly to the health programs advocated by Department of Education (DepEd).

Table 2: Knowledge in Hand Hygiene According to Grade Level and School Type

Knowledge in Hand Hygiene According to Grade Level	Grade 4		Grade 5		Grade 6		Overall	
	WM	VI	WM	VI	WM	VI	WM	VI
1. Hand hygiene is being taught by teachers inside the classroom.	2.81	Agree	2.81	Agree	2.72	Agree	2.78	Agree

2. Alcohol based hand rub or sanitizers are alternative hand hygiene methods when water & soap are not available.	2.80	Agree	2.82	Agree	2.84	Agree	2.82	Agree
3. Diseases can be prevented through hand hygiene.	2.86	Agree	2.87	Agree	2.92	Agree	2.89	Agree
4. Proper hand hygiene using soap & water or alcohol /sanitizer is important.	2.95	Agree	2.95	Agree	2.94	Agree	2.95	Agree
5. Proper hand hygiene promotes good health.	2.94	Agree	2.95	Agree	2.96	Agree	2.95	Agree
6. Before eating one must clean hands.	2.90	Agree	2.95	Agree	2.97	Agree	2.94	Agree
7. After eating one must clean hands.	2.79	Agree	2.83	Agree	2.82	Agree	2.81	Agree
8. After using comfort rooms one must clean hands.	2.89	Agree	2.93	Agree	2.91	Agree	2.91	Agree
9. Hand hygiene must become a cleansing habit.	2.89	Agree	2.92	Agree	2.87	Agree	2.89	Agree
10. Hand hygiene involves a step by step process	2.86	Agree	2.85	Agree	2.80	Agree	2.84	Agree
Composite Mean	2.8690	Agree	2.8882	Agree	2.8746	Agree	2.877	Agree

Knowledge in Hand Hygiene According to School Type	Public		Private		Overall	
	WM	VI	WM	VI	WM	VI
1. Hand hygiene is being taught by teachers inside the classroom	2.88	Agree	2.73	Agree	2.78	Agree
2. Alcohol based hand rub or sanitizers are alternative hand hygiene methods when water & soap are not available.	2.82	Agree	2.82	Agree	2.82	Agree
3. Diseases can be prevented through hand hygiene.	2.94	Agree	2.86	Agree	2.89	Agree
4. Proper hand hygiene using soap & water or alcohol /sanitizer is important.	2.96	Agree	2.94	Agree	2.95	Agree
5. Proper hand hygiene promotes good health.	2.99	Agree	2.93	Agree	2.95	Agree
6. Before eating one must clean hands.	2.97	Agree	2.92	Agree	2.94	Agree
7. After eating one must clean hands.	2.81	Agree	2.81	Agree	2.81	Agree
8. After using comfort rooms one must clean hands.	2.96	Agree	2.89	Agree	2.91	Agree
9. Hand hygiene must become a cleansing habit.	2.90	Agree	2.89	Agree	2.89	Agree
10. Hand hygiene involves a step by step process	2.92	Agree	2.79	Agree	2.84	Agree
Composite Mean	2.9153	Agree	2.8566	Agree	2.8775	Agree

Legend: Composite Mean and Verbal Interpretation 1.0 – 1.49 = Disagree
1.5 – 2.49 = Uncertain
2.5 – 3.00 = Agree

Nonetheless, both groups of elementary pupils from grades 4, 5 and 6 from public and private schools agreed that hand hygiene using soap and water is taught inside the classroom. Moreover, alternative method of using alcohol-based hand rub or sanitizer may be employed in the absence of soap & water for the students believe acquiring diseases can be prevented through hand hygiene. Specifically, this method of removing microorganisms should be done before & after eating, and after using comfort rooms. Likewise, as hand hygiene involves step-by-step process, knowledge on proper cleaning of hands using soap & water, and alcohol or sanitizer is important to promote good health, thus, must become a cleansing habit.

Knowledge is gained through formal education including concepts pertaining to achieving level of wellness. The school, serving as second home with the teachers as surrogate parents, is instrumental in the students' acquisition of knowledge particularly on good health. The findings of the study which relate public school pupils to have higher hand hygiene knowledge are influenced by the thrust of the DepEd using the public school system to aggressively promote its health agenda. Public schools being funded and controlled by the government is obliged to follow all implementing rules, regulations and guidelines provided in the DepEd memorandum. The Essential Health Care Program (EHCP) is a government program that promotes hand washing, tooth brushing and de-worming among pre-school and elementary pupils, through the support of UNICEF together with Procter and Gamble (P&G). It is coordinated and implemented through the local divisions of DepEd with technical assistance from the NGO Fit for School, Inc. This program will not only teach children healthy habits but also make them an instrument in teaching these healthy habits when they come home after school (UNICEF, Flagship DepEd program to improve health and hygiene in school children https://www.unicef.org/philippines/mediacentre_17977.html). Children who have been taught hand washing at school bring that knowledge home to parents and siblings (CDC, Hand washing: A Family Activity <https://www.cdc.gov/healthywater/hygiene/hand/handwashing-family.html>).

Table 3: Differences in Knowledge of Hand Hygiene Based on Grade Level and School Type

Variable	p-value	Significance
Grade Level	0.342 (F-value = 1.073, df = 2; 1115)	Not Significant
School Type	<0.001 (t-value = -3.425; df = 1116)	Highly Significant

Noteworthy, Table 3 presents that the grade level is not significant in affecting knowledge in hand hygiene as reflected in p-value of 0.342. In contrast, school type is highly significant as manifested by p-value of 0.001, <0.001. The knowledge in hand hygiene of the pupils from grades 4, 5 and 6 is not different from one another because they follow the same program as implemented by the Department of Education under D O. No. 65, s. 2009 titled “Implementation of the Essential Health Care Program (EHCP) for the School Children,” issued in an effort to institutionalize good health and hygiene practices among pupils. In fact, a manual for teachers for the implementation of the Essential Health Care Program in Schools third edition was published by the Department of Education spearheaded by its Secretary Armin A. Luistro highlighting the role and responsibilities of students, teachers, principals, school health personnel, parents, and Parents-Teachers Association (PTA) among others. Particularly, teachers are instructed to orient the children on the activities and facilitate participatory learning in addition to conducting lectures or lessons on hand washing.

Even though public and private schools follow the same guidelines on health program, D O. No.65, the school head plays a crucial role in ensuring that the basic requirements and standards of this policy are met. Part of the responsibility of the school principal as written in the manual of EHCP is to call for PTA assembly to properly inform parents and teachers about EHCP, include group hand washing and tooth brushing activities in the daily class programs, and instruct all teachers in the school to ensure strict compliance with the EHCP guidelines. If the school administrators are not zealous in this campaign, knowledge of the pupils may be adversely affected, whereas public schools are more necessitated to conform to the DepEd

memorandum due to the fact their resources in promoting EHCP is subsidized by the government. In addition, the number of section per grade level is greatly less in the public schools compared to the private schools where the study was conducted, usually only one section per grade level on the former. This can be a pivotal factor in the dissemination and follow-up on the knowledge taught by teachers regarding hand hygiene.

Table 4: Practice in Hand Hygiene According to Grade Level and School Type

Practice in Hand Hygiene According to Grade Level	Grade 4		Grade 5		Grade 6		Overall	
	W M	VI	W M	VI	WM	VI	W M	VI
1. I only use water to clean hands.	2.3 9	Sometimes	2.3 7	Sometimes	2.52	Frequently	2.4 2	Sometimes
2. I use soap and water as a better hand hygiene technique.	3.6 6	Always	3.5 7	Always	3.54	Always	3.5 9	Always
3. Before eating I do hand hygiene.	3.4 8	Frequently	3.3 7	Frequently	3.46	Frequently	3.4 3	Frequently
4. After eating I do hand hygiene.	3.3 7	Frequently	3.3 4	Frequently	3.42	Frequently	3.3 8	Frequently
5. After using the C.R. I do hand hygiene.	3.4 0	Frequently	3.3 8	Frequently	3.51	Always	3.4 3	Frequently
6. I use alcohol based hand rub or sanitizer if water or soap is unavailable.	3.1 8	Frequently	3.0 3	Frequently	3.08	Frequently	3.0 9	Frequently
7. I use clean towel or tissue to dry my hands after hand washing.	3.3 5	Frequently	3.4 6	Frequently	3.31	Frequently	3.3 8	Frequently
8. I use my own clothes to dry my hands after hand washing.	1.9 0	Sometimes	1.9 7	Sometimes	2.13	Sometimes	2.0 0	Sometimes
9. I wave my hands to air dry after doing hand hygiene.	2.4 9	Sometimes	2.3 3	Sometimes	2.26	Sometimes	2.3 6	Sometimes
10. I do hand hygiene following a step by step procedure in a span of 40 – 60 seconds)	2.6 0	Frequently	2.4 0	Sometimes	2.51	Always	2.5 0	Frequently
Composite Mean	2.9 815	Frequently	2.9 212	Frequently	2.97 33	Frequently	2.9 578	Frequently

Practice in hand Hygiene According to School Type	Public		Private		Overall	
	W M	VI	W M	VI	W M	VI

1. I use only water to clean hands.	2.3 1	Sometimes	2.4 9	Sometimes	2.4 2	Sometimes
2. I use soap and water as a better hand hygiene technique.	3.7 2	Always	3.5 1	Always	3.5 9	Always
3. Before eating I do hand hygiene.	3.6 7	Always	3.3 0	Frequently	3.4 3	Frequently
4. After eating I do hand hygiene.	3.6 6	Always	3.2 2	Frequently	3.3 8	Frequently
5. After using the C.R. I do hand hygiene.	3.5 7	Always	3.3 5	Frequently	3.4 3	Frequently
6. I use alcohol based hand rub or sanitizer if water or soap is unavailable.	3.0 8	Frequently	3.1 0	Frequently	3.0 9	Frequently
7. I use clean towel or tissue to dry my hands after hand washing.	3.4 5	Frequently	3.3 3	Frequently	3.3 8	Frequently
8. I use my own clothes to dry my hands after hand washing.	1.8 2	Sometimes	2.0 9	Sometimes	2.0 0	Sometimes
9. I wave my hands to air dry after doing hand hygiene.	2.2 0	Sometimes	2.4 4	Sometimes	2.3 6	Sometimes
10. I do hand hygiene following a step by step procedure in a span of 40 – 60 seconds)	2.6 6	Frequently	2.4 2	Sometimes	2.5 0	Frequently
Composite Mean	3.0 149	Frequently	2.9 261	Frequently	2.9 578	Frequently

Legend: Composite Mean and Verbal Interpretation
 1.0 – 1.49 = Never
 1.5 – 2.49 = Sometimes
 2.5 – 3.49 = Frequently
 3.5 – 4.00 = Always

In relation to practice, the pupils frequently perform hand hygiene as illustrated by a composite mean of 2.981 from grade 4, 2.921 from grade 5 and 2.973 from grade 6 as summarized from the results from either school type and displayed on Table 4. In the same way, according to school type, a composite mean of 3.01 from public schools and 2.92 from private schools indicating frequent performance of hand hygiene was generalized. This implies further that frequently they wash their hands using water but better with hand soap which they do before & after eating and after using the comfort room. When water and soap are unavailable, they use alcohol or sanitizer to clean their hands following a step-by-step procedure. Given availability of clean towel or tissue, it is used frequently to dry hands, otherwise patting on own clothes or air dry are the next options. Interestingly, all pupils from grades 4, 5 and 6 answered handwashing practice using soap and water as a better technique in hand hygiene. Unfortunately, only grade 6

pupils responded to always practice hand hygiene after using the comfort room in a manner that follows a step by step procedure.

The aforementioned findings were in contrast to the study made by Freeman, et.al (2014) who found out that hand washing after contact with excreta is poorly practiced on a global scale, despite the probable health benefits. Hand drying practices among Kenyans mentioned using a clean towel to dry hands was uncommon. Typically, women dried hands on their waist cloth or clothes. Children usually wiped hands on their clothes, shook them or did not dry them. Most people wiped hands on their clothes after sneezing. Such practices made Pearson, et.al. (2013) conclude that hand drying on clothes and rags may compromise the benefits of hand washing with soap.

Table 5: Differences in Practice of Hand Hygiene Based on Grade Level and School Type

Variable	p-value	Significance
Grade Level	0.080 (F-value = 2.537, df = 2; 1115)	Not Significant
School Type	<0.001 (t-value = 1.578; df = 1116)	Highly Significant

Concerning practice of hand hygiene, only the school type has highly significant relationship emphasized on Table 5 with p-value of <0.001. Recapitulating the objective of EHCP in its third edition, education and health go hand in hand. Children need to be healthy to be fit for school. EHCP is cost effective and can be easily implemented on a mass scale, even in under-resourced communities through an existing, well-organized institution – the public school system. School is a second home to most children. Because of the country's widespread poverty, the school is also often the only environment that is equipped with the resources to expose children to healthy practices. The role of teachers is especially vital to the success of EHCP. Through their commitment to the program, they ensure that these interventions are correctly practiced by their pupils and become lifelong, healthy habits. As mentioned earlier, the school head shall spearhead the implementation of the EHCP, thus, strong leadership on this aspect will be beneficial for the pupils otherwise will not produce fruitful outcomes.

Sadly though, as expressed by the Department of Education, public schools do not have favorable facilities for practice and execution of the EHCP campaign. With the acceptance of

public school pupils of the challenges in the practice of hand hygiene due to inadequate facilities, certain strategies are done to augment the situation. From an interview made with teachers and principals of the public schools, this predicament is neutralized with the support of parents and teachers by shelling out personal money to buy supplies for hand hygiene. In some cases, including the repair and building of new lavatory. When schools, families, and community groups work together to support learning, children tend to do better in school, stay in school longer, and like school more (NEA, 2015). Scarborough (2002) mentioned while a fundamental personal hygiene practice, hand washing is often not done when necessary or is ineffectively done. Hand washing is a learned behavior. To be effective, proper hand washing must be learned, preferably as a child, so that it becomes a routine habit throughout life.

Table 6: Facilities Utilization According to Grade Level and School Type

Facilities Utilization in Hand Hygiene According to Grade Level	Grade 4		Grade 5		Grade 6		Overall	
	W	VI	W	VI	W	VI	W	VI
	M		M		M		M	
1. There are sinks at school for hand washing.	2.8	A & U	2.9	A & U	2.9	A & U	2.9	A & U
2. There are faucets at school on which clean water flows for hand washing)	2.9	A & U	2.9	A & U	2.9	A & U	2.9	A & U
3. There are clean containers at school for water storage that can be used for hand washing.	2.3	A & NU	2.3	A & NU	2.4	A & NU	2.4	A & NU
4. There are soap & water inside the school's CR for hand washing.	2.0	A & NU	2.0	A & NU	1.9	A & NU	2.0	A & NU
5. There are clean towels or tissue in the school to dry hands.	1.5	A & NU	1.3	NA	1.5	A & NU	1.4	NA
6. There are machine hand dryers in the school.	1.1	NA	1.0	NA	1.0	NA	1.0	NA
7. There are alcohol based hand rub or sanitizers in the school.	1.6	A & NU	1.5	A & NU	1.6	A & NU	1.6	A & NU
8. There are liquid soap dispenser in the school.	1.8	A & NU	1.6	A & NU	1.7	A & NU	1.7	A & NU
9. There are soap dish in the school.	1.8	A & NU	2.0	A & NU	2.0	A & NU	1.9	A & NU
10. There are sufficient facilities and supplies in the school to promote hand hygiene	2.4	A & NU	2.4	A & NU	2.2	A & NU	2.3	A & NU
Composite Mean	2.0	A & NU	2.0	A & NU	2.0	A & NU	2.0	A & NU
	521		393		500		470	

Facilities Utilization in Hand Hygiene According to School Type	Public		Private		Overall	
	W M	VI	W M	VI	WM	VI
1. There are sinks at school for hand washing.	2.8 7	A & U	2.9 2	A & U	2.90	A & U
2. There are faucets at school on which clean water flows for hand washing)	2.9 4	A & U	2.9 2	A & U	2.92	A & U
3. There are clean containers at school for water storage that can be used for hand washing.	2.4 4	A & NU	2.3 8	A & NU	2.40	A & NU
4. There are soap & water inside the school's CR for hand washing.	2.7 1	A & U	1.6 5	A & NU	2.03	A & NU
5. There are clean towels or tissue in the school to dry hands.	1.9 3	A & NU	1.2 1	NA	1.47	NA
6. There are machine hand dryers in the school.	1.0 8	NA	1.0 7	NA	1.07	NA
7. There are alcohol based hand rub or sanitizers in the school.	2.0 6	A & NU	1.3 5	NA	1.60	A & NU
8. There are liquid soap dispenser in the school.	2.3 8	A & NU	1.3 9	NA	1.74	A & NU
9. There are soap dish in the school.	2.7 8	A & U	1.5 5	A & NU	1.99	A & NU
10. There is facilities and supplies in the school to promote hand hygiene	2.6 7	A & U	2.1 6	A & NU	2.34	A & NU
Composite Mean	2.3 855	A & NU	1.8 591	A & NU	2.04 70	A & NU

Legend: Composite Mean and Verbal Interpretation 1.0 – 1.49 = Not Available (NA)
1.5 – 2.49 = Available and Not Utilized (A & NU)
2.5 – 3.0 = Available and Utilized (A & U)

With regard to facilities utilization explained in Table 6, grades 4, 5 and 6 pupils from either school type responded that facilities and supplies to promote hand hygiene are available but not utilized based on the composite mean of 2.052, 2.039, and 2.050 respectively. Although, as a whole, public schools composite mean for facilities utilization is higher 2.385 in contrast with private schools rating of 1.859 both values still fall short in maximizing utilization of amenities for hand hygiene based on the verbal interpretation aforementioned. In scrutiny, grades 4, 5 and 6 pupils stated sinks and faucets from which clean water flows are available and utilized. Moreover, grade 5 students indicated clean towels or tissue for drying hands are not

available in opposition to the manifest of grades 4 and 6 students which are available but not utilized giving an overall verbal interpretation of not available. Likewise, it was a consistent result from grades 4, 5 and 6 pupils that machine hand dryers are not available in either school type.

Upon closer look in the data of school type, public schools conveyed availability and utilization of sinks and faucets in which clean water flows and utilization of soap, and soap dish for hand hygiene. In fact, they communicated sufficient availability of facilities and supplies in the school to promote hand hygiene. On the other hand, private schools revealed availability and utilization of sinks and faucets only. Further, specific supplies/machine for hand hygiene are not available which include clean towels or tissue for drying hands, machine hand dryer, alcohol-based hand rub or sanitizers and liquid soap dispenser. Sufficient availability of facilities and supplies in the school to promote hand hygiene is present but not utilized.

The findings noted were related to the researchers conducted by the following authors. The study made by Quintero, Freeman and Neumark (2009) reiterated that scarcity of adequate facilities in most schools in Bogotá prevents children from adopting proper hygienic behavior and thwarts health promotion efforts. Eseoghene and Ujoro (2013) stressed the same that hand washing facilities in the schools were few and their usage were hindered by barriers such as lack of maintenance culture, lack of hand washing supplies among others. Also, these findings hold true as mentioned by Asiimwe (2015) who found out in his study that even if all the primary schools had variety of sanitation facilities, these are poorly utilized, not enough to meet the number of users, lack sanitation materials and not usually clean. Schools can come up with solution on these problems by designing sanitation and hygiene policies and programs to groom pupils and schedule regular cleaning of facilities. Department of Health, Rhode Island United States has made a proposed set-up for a hand washing facility suggested in Appendix A.

Table 7: *Differences in Facilities Utilization of Hand Hygiene Based on Grade Level and School Type*

Variable	p-value	Significance
Grade Level	0.912 (F-value = 0.092, df = 2; 1115)	Not Significant
School Type	<0.001 (t-value = 23.504; df = 1116)	Highly Significant

Relating to facilities utilization as gleaned on Table 7, grade level has p-value of 0.912, demonstrative of not significant connection, while school type is highly significant as exemplified by p-values of < 0.001 . Regardless of students' grade level, their hand hygiene needs will be the same, as well as their susceptibility of contracting illnesses will not change due to lack of facilities and supplies to clean hands. The findings were supported by the succeeding researches made which also shed light that knowledge and practice in hand hygiene could only get as far depending on the availability of the facilities for its utilization.

Reiterating the relevance of facilities and supplies for hand hygiene promotion, there are often too few hand sinks available. Even if one sink were available in a classroom, it could take approximately 30 minutes for 30 students to properly wash their hands. In addition, some are too high for easy access and many are located outside the classroom where supervision is limited. Soap and paper towels are frequently in short supply and hot water is often not available in many school bathrooms (Wang, 2014).

Saboori et.al (2013) found that Kenyan students from primary schools that received regular soap provision washed their hands with soap 32% of the time compared to 3% among students from primary schools that did not receive soap. However, they found that hand contamination with fecal bacteria was similar between these students. Even when soap is provided, other barriers, such as availability water for hand washing, existing social norms among teachers and lack of incentive and accountability, prevent good hand washing behavior.

Remarkably, school type holds the distinction of being highly significant in hand hygiene knowledge, practice and facilities utilization. Perhaps due to the popular belief that privatization schemes assume that private schools produce greater desirable outcomes, regardless of the background of their students (Somers, McEwan, & Willms, 2004). For this reason parents and students expect value for their money. This constitutes quality educational services and facilities that not merely satisfy needs but more likely provide add-on value that maximizes purchasing power. Based on the findings, pupils from public schools indicated belief that sufficient availability of facilities and supplies to promote hand hygiene is present in their institution unlike the opinion of private schools.

Furthermore, since majority of the pupils enrolled in public schools belong to the grass roots with an average of four to six members of the family, financial consideration is a factor in

their choice of academic institution. With that in mind, these pupils are most likely easier to please and be satisfied with the services that can be offered to them fully aware that with less cost there should be less expectation. However, going back to the over-all composite mean established in Table 6, facilities utilization according to school type garnered similar verbal interpretation of available but not utilized but a high score for public school 2.385 was noted compared to private schools 1.859.

Moreover, Nansereko (2010) emphasized that available sanitation facilities are poorly utilized which is a result of many factors including students' background and up-bringing, discipline regarding personal hygiene and weakness in implementation of sanitation and hygiene policies by the school. Educational attainment of parents positively affects up-bringing and discipline regarding personal hygiene. The cleanliness of the available sanitation facilities is not at its best and this forms part of the reasons why some of the students ignore using the facilities in school. In addition, researches at Queensland University in Brisbane, Australia reveal that users have a strong preference for using paper towels and that "hand hygiene adherence would possibly decrease if paper towels are not available in wash rooms. Joshi and Amadi (2013) concluded access to hand washing instructions and facilities improved primary school attendance.

Table 8: Proposed Health Activities in Hand Hygiene According to Grade Level and School Type

Proposed Health Activities in Hand hygiene According to Grade Level	Grade 4		Grade 5		Grade 6		Overall	
	WM	VI	WM	VI	WM	VI	WM	VI
1. Participate in the annual "Global Handwashing Day."	3.24	Interested	3.13	Interested	3.08	Interested	3.15	Interested
2. Conduct health teaching on hand hygiene.	3.29	Interested	3.29	Interested	3.23	Interested	3.27	Interested
3. Provision for individual hygiene kit.	3.45	Interested	3.39	Interested	3.44	Interested	3.43	Interested

4. Creation of school club on hand hygiene	3.28	Interested	3.06	Interested	3.07	Interested	3.13	Interested
5. Inclusion of Hand Hygiene program in the projects of Parents-Teachers Association (PTA)	3.28	Interested	3.19	Interested	3.17	interested	3.21	Interested
Composite Mean	3.3093	Interested	3.2113	Interested	3.1984	interested	3.2381	Interested

Proposed Health Activities in Hand hygiene According to School Type	Public		Private		Overall	
	WM	VI	WM	VI	WM	VI
1. Participate in the annual “Global Handwashing Day.”	3.49	Interested	2.96	Interested	3.15	Interested
2. Conduct health teaching on hand hygiene.	3.61	Highly interested	3.08	Interested	3.27	Interested
3. Provision for individual hygiene kit.	3.57	Highly interested	3.35	Interested	3.43	Interested
4. Creation of school club on hand hygiene	3.44	Interested	2.96	Interested	3.13	Interested
5. Inclusion of Hand Hygiene program in the projects of Parents-Teachers Association (PTA)	3.57	Highly interested	3.02	Interested	3.21	Interested

Legend: Weighted Mean and Verbal Interpretation
 1.0 – 1.49 = Not Interested
 1.5 – 2.49 = Somewhat Interested
 2.5 – 3.49 = Interested
 3.5 – 4.00 = Highly Interested

Pupils from grades 4, 5 and 6 belonging to either school type revealed interest on the five proposed health activities in hand hygiene as seen on Table 8. Ranking from highest to lowest based on overall weighted mean starts with provision of individual hygiene kit 3.43, conduct of health teaching 3.27, inclusion of hand hygiene program in PTA projects 3.21, participation in “Global Hand Washing Day” 3.15, and creation of a school club on hand hygiene 3.13. In terms

of school type public school pupils responded highly interested in all but two programs offered by the researchers. Explicitly obtaining top rank is conduct of health teachings on hand hygiene based on weighted mean of 3.61. This is followed by provision of individual hygiene kit, even with, inclusion of hand hygiene program in the projects by Parents-Teachers Association establishing an equal weighted mean of 3.57. Of lower weighted mean at 3.49 is participation in annual “Global Hand Washing Day,” and least is creation of school club focused on hand hygiene with weighted mean of 3.44 both numerical values receiving a verbal interpretation of interested.

Vis-a-vis, private school pupils answered interested in the same questions giving the highest score of weighted mean 3.35 on provision of individual hygiene kit. This is succeeded by conduct of health teaching gaining weighted mean of 3.08. Third is inclusion in Parents-Teachers Association projects accruing weighted mean of 3.02. Joining in Global Hand Washing Day and creation of school club geared on hand hygiene are tied on weighted mean of 2.96. Needless to say, conduct of health teaching and provision of individual hygiene kit are the consistent health activities emphasized that piqued greatest interest among the pupils.

There is a critical need for targeting health messages through schools in order to reach the most susceptible schoolchildren. This will empower the schoolchildren with the basic knowledge and skills ultimately protecting them (Zinyowera et.al, 2011). Furthermore, one article that should be contained in the hygiene kit is an antiseptic solution because Hilburn, Hammond, Fendler, Groziak (2003) indicate that use of an alcohol gel hand sanitizer can decrease infection rates and provide an additional tool for an effective infection control program. Hand sanitizers and multifaceted educational messages may have a role in improving hand-hygiene practices (Sandora, et.al. 2005). In a nutshell, these programs are imperative for schoolchildren as pinpointed by Assefa and Kumie (2014) as knowledge, awareness, training on hygiene and sanitation, being a member of hygiene and sanitation club, experience of visiting model school, and parent’s health package status were factors influential to hygiene behavior. School-based hand washing programs that are motivating and engaging to students but have no support from teachers and administrators can still face structural barriers to good hand washing practice (Xuan le et al. 2013).

Table 9: *Differences on Proposed Hand Hygiene Health Activities According to Grade level and School Type*

Health Activities	Grade Level		School Type	
	p-value	Significance	p-value	Significance
1. Participate in annual “Global Handwashing Day.”	0.065	Not Significant	<0.001	Highly Significant
2. Conduct health teaching in hand hygiene.	0.592	Not Significant	<0.001	Highly Significant
3. Provision of individual hygiene kit.	0.604	Not Significant	<0.001	Highly Significant
4. Creation of school club for hand hygiene.	0.002	Highly Significant	<0.001	Highly Significant
5. Inclusion of hand hygiene program in the Parents-Teachers Association (PTA) projects.	0.244	Not Significant	<0.001	Highly Significant

Generally, grade level has no significant difference on proposed health activities on hand hygiene with the lone exception on creation of school club, attaining p-value of 0.002 as clarified in Table 9 exhibited verbal interpretation of highly significant. Reviewing the results in Table 8, based on weighted mean of 3.28, this program occupied the third choice by grade 4 pupils at par with the proposed health activity of inclusion in Parents-Teachers Association projects. This result may have something to do that grade 4 pupils are still fascinated and enthusiasts of school clubs. According to Jean Piaget’s Cognitive Development Theory, the age of grade 4 pupils performs operational thought wherein they learn best by doing and exploring. Understandably, joining school clubs enhances the pupils’ self-discovery and learning. Corollary to this, the second choice of grade 4 students’ conduct of health teaching on hand hygiene as shown by weighted mean of 3.29 is closely tied with creation of school club for hand hygiene reflected by weighted mean of 3.28. However, for grades 5 and 6, creating a school club for the purpose of hand hygiene promotion has the lowest rank accumulating weighted mean of 3.06 and 3.07 subsequently.

More importantly, pertaining to school type, all five programs received highly significant interpretation with similar p-value of <0.001 presumably because public schools have stressed high interest in three programs: conduct of health teaching on hand hygiene, provision of individualized hygiene kit and inclusion of hand hygiene programs on Parents-Teachers Association projects. In line with these, the least program of choice by public school students which is creation of school club receiving a weighted mean of 3.44 is still a higher score

compared to the top choice program of private school students which is provision of individualized hygiene kit at weighted mean of 3.35.

Nicholson et al. (2014) enthused interventions aimed to educate children about germs, whether hands are germ free based on appearance, and how soap works. Children received cues to help them remember to wash hands at key 5 times (after defecating, before eating each meal and while bathing) and were rewarded for hand washing with soap. Mothers helped children and were encouraged through in person visits and “good mums” clubs. Other effective strategies include providing waterless hand sanitizer to primary schools with limited resources and water access. They observed that students from schools that received sanitizer cleaned their hands 82% of time after they used the toilet, compared 38% of times among students from schools provided with soap (Pickering et al. 2013).

Here in the Philippines, UNICEF has partnered with Department of Health, Department of Education and Safeguard soap to promote Global Hand Washing Day to raise awareness on the importance of hand washing with soap. Celebrated annually on October 15, Global Hand Washing Day was founded by the Global Public-Private Partnership for Hand Washing, and is an opportunity to design, test, and replicate creative ways to encourage people to wash their hands with soap at critical times specifically targeting school children, teachers, and families to get involved. UNICEF calls on parents, teachers, celebrities, government, NGOs, and the general public to urge children around the world to begin a lifetime habit of hand washing with soap. In fact, DOH Philippines has been advocating global hand washing through its active promotion in their health calendar every month of October. Likewise, from the initiative of World Health Organization and Centers for Disease Control & Prevention each year the SAVE LIVES: Clean Your Hands campaign every 5th of May aims to progress the goal of maintaining a global profile on the importance of hand hygiene in health care and to ‘bring people together’ in support of hand hygiene improvement globally (WHO, 2016b).

4.3 Implications

The implications of the results of the study entail an eye-opening fact. The society at large has preconceived notion that the situation in public school is dire, perhaps mediocre at best. But the findings refute this belief with the responses of Batangas City public school pupils of higher hand hygiene knowledge, practice and facilities utilization compared to their counterpart pupils from private schools. As such, the educational system in public schools although

challenged by numerous difficulties has strategized means to achieve its goals. With the guidance of the government, support of the parents and diligence of pupils and teachers public schools can & will deliver quality education. While private schools must not rest on its laurels, it must continue to innovate and elevate its standards in service education.

5. Conclusion

Private and public grades 4, 5, and 6 students from selected elementary schools in Batangas City, Philippines manifest high level of knowledge in hand hygiene, practice it frequently but the facilities although available are not utilized. Furthermore, school type which is being public or private has highly significant relationship. In fact, public schools showed higher level of hand hygiene knowledge, greater frequency in practice, better facilities utilization as well as greater interest in proposed hand hygiene health activities. On the other hand, grade level has no significant relationship.

6. Recommendation

The researchers recommend that school administrators execute the hand hygiene health activities proposed in this study. These include but not limited to health education on proper handwashing technique and provision of individual hygiene kit for student composed of alcohol based hand rub, liquid soap, tissue and towel. Other grooming and sanitary paraphernalia may be added. Moreover, for the City Health Office (CHO) of Batangas City to remain steadfast in spearheading the advocacy to hand hygiene particularly in schools. Likewise, continued implementation and support of University of Batangas Community Extension Services Office (UB-CESO) in this kind of health program. Specifically, private schools should adhere rigidly to the mandate of the Department of Education (DepEd) in promoting wellness to Filipino school children through the Essential Health Care Program (EHCP).

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Appendix A



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HANDWASHING FACILITIES

Number: At least one plus an additional number for convenient use by employees in the following locations:

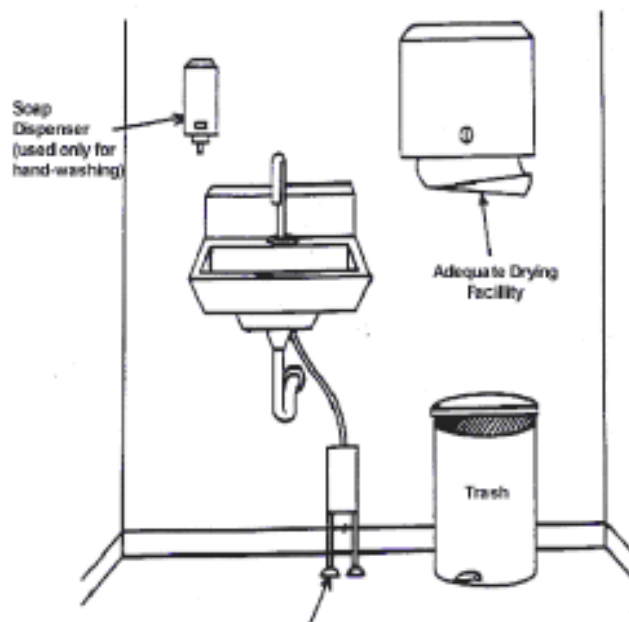
- Toilet Rooms
- Food Preparation Areas
- Food Dispensing Areas
- Dishwashing Areas

Note: Must be easily accessible. Do Not Block or fill with equipment/supplies

Use: Hand washing only

The following must be available at each hand washing facility:

- Hot and Cold Running Water
- Soap
- Paper towels or hand drying device
- Waste receptacle (must be covered in women's and unisex restrooms)



Handwash Sink Example