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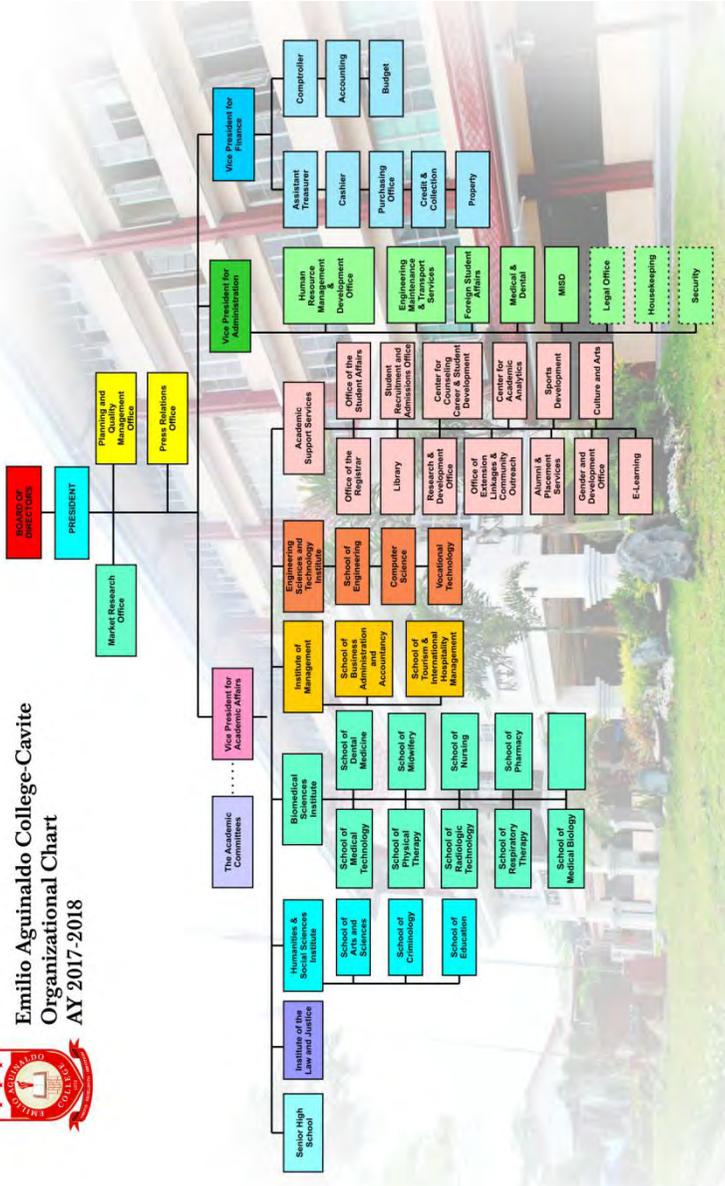
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# EAC ORGANIZATIONAL CHART



**Emilio Aguinaldo College-Cavite  
Organizational Chart  
AY 2017-2018**



## **Brief History of Emilio Aguinaldo College**

The beginnings of Emilio Aguinaldo College - Cavite are attributed to Dr. Paulo C. Campos, then President of the University Physicians Services Incorporated (UPSI), which acquired the Marian College in Manila in 1973. Eventually, the school became Emilio Aguinaldo College.

With the various socio-economic developments and related circumstances during the Marcos regime, UPSI decided to open a new campus in Dasmariñas, Cavite, which is the hometown of Dr. Campos. This is to support the government's policy on the dispersal and decongestion of the student population in Metro Manila, particularly in institutions of higher learning. The policy also aimed to introduce regional development and democratization of opportunities in the rural areas (Campos, 2008).

Emilio Aguinaldo College in Bagong Bayan, Dasmariñas, Cavite was opened on March 17, 1978. Its opening coincided with the efforts of the then President, Ferdinand E Marcos and wife Imelda Marcos, who was the Minister of Human Settlements and Community Development, to remove the slum dwellers from the streets and under bridges of Manila and relocate them to Cavite. Dr. Campos proposed to the government through the Secretary of Education, Juan L. Manuel, to offer a tertiary school in Dasmariñas, Cavite patterned after the Emilio Aguinaldo College that had been approved in Manila (Campos, 2008).

Consequently, a campus comprising 29 hectares was established. In 1976 to 1978, UPSI developed over a dozen school facilities including school rooms, laboratories, a library, social hall, an administration building, dormitories, an Olympic oval, a landscaped campus, and a man-made lake. They also built a network of roads that covered the whole campus and dormitories (Campos, 2008). A commitment to improve the lives of the underprivileged sectors of the community motivated EAC-Cavite to offer courses in Dressmaking, High Speed Machine Operation and Ceramics. All programs were structured either for six months or two years of intensive study and training.

In the following year, owing to the permit granted by Minister Juan Manuel of the Ministry of Education and Culture, EAC-Cavite opened the College of Criminology, listing among its students the police forces in Cavite as well as the members of the Philippine Constabulary and the security guards of the establishments in the vicinity. In addition, the Graduate Program leading to the degree of Master of Arts in Teaching was offered to provide the school teachers with professional and academic advancement and opportunities. Envisioned, too, were the programs for Master of Science in Nursing and Master of Arts in Education.

On October 21, 1979, General Emilio Aguinaldo Medical School Foundation Inc. (GEAMSF) was established in Dasmariñas, Cavite, thus giving birth to the Emilio Aguinaldo College- Cavite of Medicine with Dr. Lourdes E. Campos as Dean. In its first year of operations, the College had 150 students. The University Medical Center (UMC), which was built in 1980 and opened in 1983, served as the training center for the health science students of the College of Medicine and other health science courses.

In 1980, UPSI formed the Yaman Lahi Foundation, Inc. (YLFI) to manage and operate both Manila and Cavite campuses.

In 1986, when Dr. Paulo Campos was not in perfect health anymore, Brother Andrew Gonzales of the De La Salle University (DLSU) expressed the University's interest in acquiring the EAC College of Medicine and the University Medical Center (UMC). Since his UPSI colleagues were not ready to take over, Dr. Campos decided to transfer the ownership and responsibility to this worthy and credible institution.

It was in June 1987 when De La Salle University finally took over the management and the administration of two campuses from UPSI: the 29-hectare campus in Bagong Bayan, Dasmariñas and the 1.5 hectare Health Science Campus along Congressional Avenue. Included in the transfer were the two big buildings which had a length of 100 meters, 17-meter wide and seven levels of floor area with two elevators, including a basement, ground floor, and rooftop for water tanks and for viewing purposes. The 29-hectare property in Bagong Bayan had a dozen buildings that included classrooms, two administrative units, Olympic oval, network roads and a landscape that included a lake, teaching facilities, hospital equipment, a modest library and a historical museum. After that, the EAC Administration focused on the development of EAC-Manila.

EAC-Cavite reopened in 1996-1997 as a vocational technical school – Center for Technical Education and Skills Training (CTEST) - in a lot along Congressional Avenue (now Mangubat Avenue) which UPSI bought. In 1998, after the completion of five buildings, the voc-tech school became the EAC-Cavite campus and all academic courses were opened except medicine.

In 2001, under the leadership of Dr. Jose Paulo E. Campos, the first son of Dr. Jose Paulo E. Campos, the school administration strengthened the curricula of existing academic programs and opened new courses aligned with emerging trends. In 2003, the Commission on Higher Education (CHED) granted government recognition to AB Communication, Psychology, Business Administration, Accountancy, Computer Science, Secondary Education, and Hotel and Restaurant Management.

The other academic programs soon followed. In 2005, Elementary Education, Civil Engineering, Mechanical Engineering, and Diploma in

Graduate Midwifery earned government recognition, followed by Nursing and Criminology in 2006; Customs Administration in 2007; and Computer Engineering and Electronics and Communication Engineering in 2010.

In 2008, the Technical Education and Skills Development Authority (TESDA)-registered vocational-technical courses, namely, Automotive Servicing, Computer Hardware Servicing, Consumer Electronics Servicing, Machining, and Programming were offered. In response to the emerging trends on health sciences, real estate and tourism, the administration opened Medical Technology, Physical Therapy and Radiologic Technology in 2011, Doctor of Dental Medicine and Real Estate Management in 2012, and Bachelor of Science in Midwifery and Tourism Management in 2015.

In its quest to achieve excellent standards in higher education, the institution participated in the accreditation by the Philippine Association of Colleges and Universities Commission on Accreditation (PACUCOA), thus, receiving Level 1 Accredited Status in Nursing, Psychology, Criminology and Hotel and Restaurant Management programs in 2015 up to 2018. Likewise, Elementary Education, Secondary Education and Business Administration programs were granted Candidate Status until 2017.

Along with the commitment to innovate, the institution inaugurated the *Bulwagang Aguinaldo* in 2012, which was the replica of the Aguinaldo Shrine in Kawit, Cavite making it the ideal venue for the annual Philippine Independence Day Celebration held by the city government of Dasmariñas. The modernization of Buildings 3 and 4 which house the Life Science Institute, Engineering Science and Technology Institute, and School Library were completed in 2014. These developments sought to meet the needs of the growing student population.

In adhering to the call of the Department of Education (DepEd) headed by Secretary Bro. Armin Luistro to enhance the basic education program in the country, the institution earned the permit to implement the Senior High School programs in April 2015. This paved way for the restructuring of Building 5 for Senior High School and Building 6 which housed the new canteen and multi-purpose hall. The Senior High School started its operations and welcomed its pioneer batch in June 2016.

The institution strives to explore more avenues to serve its community and undertake worthwhile development programs towards its continuous transformation as a responsive and competent institution, as its Founders envisioned it to be.

*Special acknowledgements are accorded to Dr. Lourdes E. Campos (co-Founder), Atty. Paulo E. Campos Jr. (Director, EAEC), Dr. Jose Paulo E. Campos (EAC President), Dr. Georgina B. Palmario (Vice President for Academic Affairs), Ms. Maria Teresa Santos (Chief Librarian) and Ms. Shelley Anne C. Martinez (Executive Assistant) for their contributions to this manuscript.*

# **PHILOSOPHY**

Emilio Aguinaldo College is a private, non-sectarian, co-educational institution of learning that fosters equal and fair opportunities for the holistic development of the persons conscious of their national identity and their roles in the global community.

## **VISION**

Emilio Aguinaldo College envisions itself as an internationally recognized autonomous academic institution rooted in its nationalist tradition that consistently pursues the advancement and welfare of humanity.

## **MISSION**

Emilio Aguinaldo College provides an outcomes-based education with relevant curricula geared towards excellent research, active industry cooperation and sustainable community extension.

## **CORE VALUES**

### **Virtue**

Emilio Aguinaldo College integrates knowledge and understanding among Emilians equipping them with wisdom to choose to do only the right thing.

### **Excellence**

Emilio Aguinaldo College inculcates among Emilians the habit of doing only the best in all undertakings.

### **Service**

Emilio Aguinaldo College develops among Emilians a strong sense of duty and responsibility of helping others for the school, community, country and Mother Nature.

## **EDUCATIONAL OBJECTIVES**

The objectives of Emilio Aguinaldo College are to:

- offer opportunities for quality and relevant education to all;
- cultivate the intellectual, spiritual, moral, social and physical aspects of a person;
- instill appreciation and pride for one's national identity; and
- produce graduates of global quality equipped with competencies in their field of expertise.

## **QUALITY POLICY**

Emilio Aguinaldo College commits to the continuous improvement of quality standards with emphasis on instruction, research and community service to benefit its stakeholders.

## **QUALITY OBJECTIVES**

The objectives of the Emilio Aguinaldo College are to:

- Adhere to all statutory and regulatory standards;
- Provide consistent quality service to the students, parents and other stakeholders; and
- Respond to periodic system review for continual improvement on quality standards.

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# **Chapman’s “Love Languages” as a tool to increase students’ intrinsic motivation in a classroom setting**

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## **Abstract**

This action research was conducted through the participation of the AB Communication students enrolled in their professional subjects in Emilio Aguinaldo College – Cavite. Its purpose was to find out if students’ love languages have an impact on achieving intrinsic motivation inside the classroom. The participants were given a questionnaire to determine their love languages, followed by a pre and post Intrinsic Motivation Test. This aimed to find out (1) the most prevailing love language of the students that they need to concentrate on to motivate them more in the classroom participation;(2) the scores of the students in the pre-test and post-test Intrinsic Motivation Test (IMT); (3) the significant difference in the pre and post-test results; and lastly (4) the action plan that can be used to increase students’ intrinsic motivation through Chapman’s love languages as a tool. The Five Love Languages Relationship Theory of Chapman (1992) was anchored in this study. Results of the study revealed that students’ intrinsic motivation increased when the teacher used to identify each student love languages to address their needs inside the classroom. Using individual’s love languages should improve the learning process and encourage the students on retaining their positive behavior towards school. Thus, when positive behavior occurred by filling in the love tank of the students, intrinsic motivation is indeed increased. As an action plan, this research provided the different steps and guidelines on how to improve intrinsic motivation through Chapman’s love languages.

**Keywords:** Love Languages, Extrinsic Motivation, Intrinsic Motivation, Chapman’s Five Love Languages

## Introduction

Teachers are the second parents of the students when they are in the school. Issues inside a home also happen inside the classroom. Some students may say, “One of my classmates is my teacher’s favourite”, or someone might say, “I feel unimportant inside the classroom.” What are the reasons for these occurrences inside the classroom? Are these the same reasons children say to their parents when they feel unloved? Despite the effort exerted to make the lesson easy, why do teachers still have increasing issues on motivating the students to commit themselves fully to attend class?

There are two types of motivation; extrinsic and intrinsic. According to Benabou and Tirole (2003), extrinsic motivation is about “contingent rewards”, while intrinsic motivation is “the individual’s desire to perform the task for its own sake”. Moreover, Cherry (2016), defined intrinsic motivation as performing an action because a person enjoys it, not because he or she is trying to earn a reward, but it is intrinsically rewarding for a long term. Thus, to apply the usefulness of love languages proposed by Chapman, intrinsic motivation was scrutinized in this study.

As suggested by Chapman (1992) on his relationship theory, analyzing the love languages of children especially the little ones, will help the parents to build good parenting styles, and build strong relationships in the family. Additionally, Morales (2011) mentioned that, “teaching is touching lives. The most effective tool to touch lives is through the language of love.” In relation to this, Campbell (2008) expounded that, inside every child is an “emotional tank” waiting to be filled with love. When a child really feels loved, he or she will develop normally but when the love tank is empty, the child will misbehave,

Furthermore, Morales (2011) said that, “the sole motivating factor for staying in the field of academe most especially for those who really has a calling in teaching, is the love for the learners. Whether these learners are forced to be in the class or not, there exists this opportunity for precious times of engagement – a privilege of becoming part of each other’s lives. It is a challenge to make every engagement period meaningful and fully rewarding. The only language capable of penetrating deeply into an individual’s heart is love.”

This study proposed the principle of filling in the love tank of the learners in a classroom setting, which serves as their second home. Since that the students’ educational journey is longer now compared to before, it is the best time for the college educators to focus more on intrinsic motivation rather than extrinsic motivation.

The study therefore focused on how to achieve intrinsic motivation through the use of Chapman's Love Languages.

This study was anchored on the relationship theory coined by Chapman (1992), in which individuals can express themselves through the five love languages. These are Words of Affirmation, Quality Time, Receiving Gifts, Acts of Service, and Physical Touch. The term "Words of Affirmation" means words of encouragement to praise someone who did well in a certain task. This love language also motivates the individual to give more or exert further effort in order to succeed. People in the "Quality Time" category put more importance in the central aspect of togetherness while, the "Receiving Gifts" is about the value of thought, which implies that it is not focused on the material thing, rather it focuses on symbol implanted on the thought. "Acts of Service", on the other hand, is the subsequent type where people would feel loved if someone helps them sincerely. Finally, people feel loved by receiving caresses and skin-to-skin contacts in the "Physical Touch" category.

Chapman and Freed (2015) discussed in their research that the root of children's rebellion is lack of love. In reality, children spend most of their time in school. This is one reason why teachers should focus more on motivating them intrinsically through analyzing their love languages. This study wanted to convey that it is the best moment to revisit the motivation strategies performed by college educators. It is time to put more effort on motivating the college students so that they keep coming back to school every day. Perhaps, it is already time to adopt the motivational skills of pre-school teachers in identifying the individual differences of each of the little ones whom they are teaching and making them very excited to go to school every day. This individual difference is usually rooted to "love". Chapman (2010) stated that the teenager's desire for nurture has to do with feeding the inner spirit. Verbal abuse such as hostile, cutting, harsh or demeaning words, will malign his/her emotional development. An empty love tank affects these areas of teenager's life - motivation for learning is dissipated. Many of them usually say "Why should I study in school? No one cares what happens to me anyway?" Their ability to empathize, their development of conscience and moral judgments, - all of these are affected. Thus, their most basic need is feeling loved which explains that the most fundamental need of teenagers is to feel emotional love from the significant adults in their lives.

Several studies already proved that love languages correlate to intrinsic motivation. One of these is Egbert & Polk (2013), who found out that relational maintenance (one component of intrinsic motivation) has a significant relationship with the five love languages of Chapman's. Also, Suriyah and Septiarly (2016) conducted a constructive and factor

analysis of the five love languages of Chapman which revealed a promising composite reliability and confirmatory factor that Chapman's claim is valid.

Furthermore, a study conducted by Campbell (2008), explained that character motivation can be improved through identifying the love languages of a person. This is the same with the study of Xie, Durrington, & Yen (2011), whose conclusion was students' intrinsic motivation had a significant perceived value on their behavior during an online discussion activity. They explained that someone's character is shaped by love. Jones (n.d.) defined intrinsic motivation as participation in an activity purely out of curiosity, out of desire to engage in a task for the sake of willingly participating to complete the task, and the desire to contribute for a long-term goal. This explains why, someone's desire to achieve a long-term goal is usually shaped by a positive behavior or character, and this always originated from love.

With these gaps found by the researcher from previous studies and by thorough observations of her students' classroom performance, this study sought to know how the students would overcome issues in classroom motivation through the use of Chapman's five love languages. Most of the researches about this topic were focused on correlation of the two variables - love languages and motivation. But, no research has been recorded about using Chapman's love languages as a tool for an action research in the Philippines. Hitherto, no study has been made about using Chapman's love languages as an instrument to increase students' intrinsic motivation.

Specifically, the researcher sought the answers to the following research questions: (1) the most prevailing love language of the students that the teacher needs to concentrate on to motivate them more to take part in the classroom participation;(2) the scores of the students in the pre-test and post-test Intrinsic Motivation Test (IMT); (3) the significant difference in the pre and post-test results; and lastly, (4) the action plan that can be used to increase students' intrinsic motivation through Chapman's love languages as a scheme.

## **Methodology**

This study was an action research using quantitative approach. The researcher had the students in a classroom intervention program (*see Appendix A – for the intervention plan*) using Chapman's Love Languages as manipulative to increase their intrinsic motivation in a classroom setting. The null hypothesis of this research was tested using pre-test and post-test.

Specifically, this study followed the research design of a Classroom Action Research (CAR) of Mettetal (2012). The research pursued by Mettetal (2012) suggested that the best instrument for CAR is pre-test to post-test design, to a comparison of similar classes to a descriptive case study of a single class or student.

The participants in this research were the 30 AB Communication students of Emilio Aguinaldo College-Cavite. These students were enrolled in their professional courses during the duration period of the research. The rest of the population of the AB Communication students who were not yet enrolled in any professional course was not part of the study, as well as those who were engaged in their practicum that time.

The method of data collection was generated using two instruments. The first tool was adapted from Chapman's love languages test (*see Appendix B*). Chapman himself is a psychologist who developed this kind for different kinds of relationships (parents to children, couples, teenagers and employees). This was the tool used in the study of Polk and Egbert (2013) for "empirical testing". Also, this was the tool used in the study of Surijah and Septiarly (2016) as construct validation of five love languages. As a point for validity and reliability, this tool was also validated by Psychology professors in the School of Arts and Sciences of Emilio Aguinaldo College-Cavite. The second tool is the pre- and post-Intrinsic Motivation Test (*see Appendix C*), a modification from Intrinsic Motivation Inventory (IMI) for Laboratory experiments which was grounded on Self Determination Theory of Deci and Ryan (2000).

With the results gathered from the the love languages test, and pre-survey instrument, the Classroom Intervention Program was implemented to check if there was a difference in the intrinsic motivation of the students. This was started from mid September to early December 2016. It focused on using the students' love languages as a tool to increase their intrinsic motivation. The Classroom Intervention Program was done through different activities that addressed the students' need to fulfill their love languages, suggested praise comments for their entire classroom task, and quality consultation time (*see Appendix A – for the detailed intervention plan*). After this procedure, the researcher then conducted a post-survey Intrinsic Motivation Test (IMT) to see if their intrinsic motivation increased.

The data analysis procedure was a one-tailed data t-test at .05 significance level. This was used to analyze the pre-test and post-test after the data had been generated. The students were given two sets of questionnaires in the month of September. The first one was the Chapman's love languages test (*see Appendix B*). This instrument was

tallied based on the occurrence of the participants' love languages. Each letter in the questionnaire has a corresponding meaning that matches to Chapman's Five Love Languages. The second one was the pre-survey form (see Appendix C) about their intrinsic motivation inside the classroom. This was adapted from the Self-Motivation Quiz of Student Development Center. The researcher modified this to incorporate the different statements about Chapman's Love Languages to fit in to the standard of the study. The results from this second instrument, were obtained by using a scoring scale of 0 – 100. These are the following:

- 0-25 which means very low; the participants probably have a very low intrinsic motivation inside the classroom;
- 26 – 50 means low; this indicates that the participants allow their personal doubts and fears to keep them from succeeding in class;
- 51- 74 means moderate; this explains that the participants were doing okay on intrinsic motivation; they are certainly motivated in class but they could in achieve much higher level of motivation;
- 75 – 100 means highly motivated, which means that the participants get things done, and make conscious effort to stay motivated inside the classroom.

## Results and Discussion

Out of the 30-total population, there were 22 students who were assessed using their love languages to find if their intrinsic motivation increased. Seven (7) students failed to participate in the post-test.

### Students' Love Languages

Table 1

*Results of the students' love languages, from most prevailing to least*

Students' Love Languages	Occurrence
Words of affirmation	20
Quality time	6
Gifts	2
Acts of service	7
Physical touch	5

Table 1 shows that the most prevailing love language among students was words of affirmation. This indicates that words of

affirmation must be used most of the time inside the classroom to praise students to achieve intrinsic motivation. Chapman and Freed (2015), explained that words of affirmation is about describing the students what they are capable of doing, their strengths and their potentials. Teachers should mention how proud they are with their learners because they deserved to receive some kind, affirming and encouraging words to be more motivated in their day to day school activities. The results below also show that some of the students chose two or more love languages to best describe themselves.

### Students' Scores in the Intrinsic Motivation Test (IMT)

Table 2

*Pre-test and Post-test results from Intrinsic Motivation Test*

Participants	Pre-test Score	Post-test Score	Difference
1	88	98	10
2	72	92	20
3	60	50	-10
4	85	95	10
5	65	75	10
6	70	60	-10
7	60	80	20
8	70	70	0
9	70	90	20
10	70	70	0
11	50	80	30
12	90	90	0
13	87	97	10
14	53	63	10
15	70	90	20
16	80	80	0
17	40	90	50
18	60	80	20
19	50	70	20
20	80	90	10
21	60	80	10
22	50	80	30
<b>Mean</b>	<b>67.27</b>	<b>80.4545455</b>	<b>13.182</b>

The difference between the pre-test and post-test scores was calculated for each group to determine the improvement factor. In Table 2, the mean score for the pre-test was 67.27, while the post-test mean score was 80.45. Thus, there was a significant difference in the pre-test scores over the post-test scores. Referring to the scale given in this research (*see scale in Methodology*), this indicates that the participants got a high score in improving their intrinsic motivation. From the scale of 75-100 which means highly motivated, the participants got things done, and made conscious effort to stay motivated inside the classroom. Therefore, analyzing the students' love languages is a good factor to

consider in developing intrinsic motivation inside the classroom. In the book of Chapman (2010), it was explained that parents' guidance is very important in the adolescence stage of their children. In connection to this, Shia (n.d.) emphasized that many college students find their level of motivation not sufficient enough to guide them in carrying their academic careers. For this reason, college educators, as second parents, definitely play an important role in motivating their students intrinsically for their future careers. Hence, as the results show, students' love languages are one of the striking factors to consider for them to achieve intrinsic motivation.

### **Significant Difference of the Students' Intrinsic Motivation Test**

The results below (Table 3) shows that there is a significant difference in the pre-test to the post-test mean scores of the participants. The change between the pre-test and post-test was calculated to determine the improvement factor. The mean score for the difference was 13. 182. On the other hand, the p-value was 0.00011. Thus, there was a significant improvement in the students' scores in the Intrinsic Motivation Test (IMT). The action plan was considered useful to achieved intrinsic motivation inside the classroom.

Table 3

*Comparison of the mean scores of pre-test and post-test*

#### **Pre-Test Score**

Group	Number	Mean
Control	22	67.273

#### **Post-Test Scores**

Group	Number	Mean	p-value
Control	22	80.455	0.00011

### **The Action Plan**

To answer the question about what the action plan could be to increase intrinsic motivation inside the classroom, the researcher used the strategy presented below on how to deal with the student's different love languages for the duration of three (3) months as an intervention program. Different activities and suggestions on how to deal with the students' love languages inside the classroom were provided. For instance, if student A's love languages are Quality Time and Words of Affirmation,

the teacher addressed these love languages by providing extra time to attend to the student’s query on the lesson, and as to “Words of Affirmation”, the teacher should give praise comments to the student if a task was done seriously to show appreciation.

The diagram below was made by the researcher through a scrupulous analysis of the previous researches about teenagers, children, and adults’ love languages whether at home, workplace, or school. By combining all the results and opinions from the previous researchers on love languages, this study came up with these steps as part of the action plan.

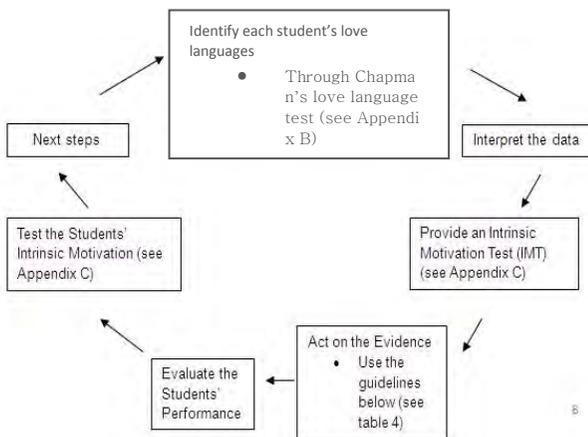


Figure 1. Steps to Achieve Intrinsic Motivation inside the Classroom through Chapman’s Love Languages

Figure 1 was based on the Classroom Action Research steps given by Ferrance (2000). According to him, to apply the action plan in a certain action research, the researcher should look into the basic themes such as empowerment of the participants, collaboration through participation, acquisition of knowledge, and social change. In the action research, action plan should be structured routines for continuous confrontation of data. Further, the intervention program (see Appendix A) is part of the action plan because the routines inside the classroom that were used through Chapman’s love languages are resources to increase intrinsic motivation.

Patton (2016) designed a study to determine if there was dominant mode of caring for second grade students in order to explore how teachers might best demonstrate the ethic of care in their classrooms.

Results revealed that a teacher who cares and portrays the five modes of Chapman's love languages had positive effects on students' social and academic performance, engagement, motivation, self-esteem, and self-connectedness. The factors revealed in the study of Patton (2016) were also the same with the components written in the Intrinsic Motivation Test (IMI) given to the participants of this study. Hence, it is acceptable that Chapman's love languages are intertwined to the development of intrinsic motivation inside the classroom.

Using Chapman's love languages as a factor to achieve intrinsic motivation should be utilized well by following the given diagram above, by following the guidelines provided in the intervention program, and by appropriately addressing each student's love languages. These should be considered conscientiously because a factor such as miscommunication on identifying one's love languages might lead to another issue inside the classroom. In line with this fact, the last phase on the diagram above explains that "next step" is necessary, in order to observe a cyclical process for the improvement of the limitations of this study.

## **Conclusions and Recommendations**

As a result of achieving intrinsic motivation using students' love languages, the group showed more interest and enjoyment when learning inside the classroom. The students became more active in class and developed more self-confidence in classroom participation. Their relationship among their peers also developed because they were able to know each other more by analyzing each of their love languages. Some of the students' scores decreased but the reasons behind it was a part of the limitation of the study. Overall, they provided concrete potentials to achieve improvement in intrinsic motivation when love languages are used as a tool to achieve lively and memorable learning environment. This only proves that identifying and dealing with the students' love languages has a positive effect on students' academic performance.

The researcher found out the if the students are given the opportunity to describe themselves more though their love languages, they will learn and be more active in classroom discussion and even more in school activities. Hence, the researcher would like to recommend the action plan presented for classroom lecture or activities to improve the students' intrinsic motivation. Upon analyzing and understanding each student love languages will be facilitated their interest in class and enjoyment in learning. Thus, this action research proved that it is a challenge to make every classroom engagement meaningful and totally rewarding. The limitations of the study are enormous aspects to be considered for future research such as, identifying the love languages of the students based on their gender, students' response to their teachers'

love language, observation on how teachers employ love languages in class, and a deeper investigation on the association of love languages to intrinsic motivation that may lead to a qualitative research design.

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## Appendix A

### CLASSROOM INTERVENTION PROGRAM

**Instruction:** Before doing the intervention program, the first step should be asking the students to answer the Chapman's Love Languages Test (*see Appendix B*), then to have an initial knowledge on the status of the students' intrinsic motivation, the next step is getting the pre-test score (*see Appendix C*). After the duration of intervention program, the last procedure should be facilitating the post-test (*see Appendix C*) to see if their intrinsic motivation increase.

<b>TEACHING BEHAVIOR</b>	<p><b>TEACHING BEHAVIOR</b> (<i>how will you teach, when you re-teach, how will you remind students</i>)</p> <p>Be in class on time, use indoor voice, say please and thanks Review previous lesson Introduce the new lesson</p>	
	<p><b>CLASSROOM PROCEDURE</b> (<i>daily routine</i>)</p> <p>Asks the students to be responsible in submitting assignments (if applicable) Students may use the restroom for 5 minutes as the teacher prepares for the evaluation of the current lesson. Asks a willing student to assist you with your materials (Acts of Service) Provide 5 minutes before or after the lesson to listen to students concerns (Quality Time)</p>	
<b>Feedback System</b>	<p>(<i>How will you recognize appropriate behavior based on the Chapman's love languages instrument</i>)</p> <p>Verbal feedback – give praise comments during recitation (Words of Affirmation) Provides small tokens – extra grade points, small tokens like pens. (Receiving Gifts) Refer to the given guidelines below.</p>	
<b>Environment</b>	<p><b>ACTION PLAN</b></p> <p>Minimize congestion Establish clear routines and procedure Clarify transitions Check students love language by observing their behavior (verbal and nonverbal) Balance class schedule; eliminate downtime</p>	<p><b>RESOURCES</b></p> <p>Arranging room Preventing behavior problem by referring to the Chapman's love languages tool (see examples given in the guidelines below)</p> <p>Designing more engaging activities (refer to the Chapman's love languages guidelines below)</p>

Love Languages	Definition	Possible Feedback for Students Performance / Classroom Activities
Words of Affirmation	<p>These are words of encouragement to praise someone who did well in a certain task. This love language also motivates the individual to give more or exert further effort in order to succeed (Campbell, 2008).</p>	<p>I like what you did here.  I love how hard you are working on your project  You should be proud of yourself.  Great effort!  Great try!  Stellar Job!  I think you are doing great work. What do you think?  This is a great product.  How do you think you did?  I think you have an eye for this task, that's why I assigned you as the leader.  I notice you love doing things like this. That's why I hand over to you this activity.</p>
Quality Time	<p>"A central aspect of quality time is togetherness. Not proximity ... but it has something to do with focused attention" (Morales, 2011 as cited from Chapman, 1995).</p>	<ol style="list-style-type: none"> <li>1. Maintain eye contact when your friend/student is talking,</li> <li>2. Don't listen and do something else at the same time.</li> <li>3. Listen for feelings.</li> <li>4. Observe body language</li> <li>5. Refuse to interrupt.</li> <li>6. Provide at least five minutes before and after the lecture to talk to them by asking them about their day.</li> <li>7. Try to listen to them before judging and creating conclusion.</li> </ol>
Receiving Gifts	<p>The gift is a symbol of the thought. It doesn't matter whether it costs money... what is important is the thought. And it is not the thought implanted only in the mind that counts, but the thought expressed in actually securing a gift and giving it as an expression of love (Morales, 2011).</p>	<ol style="list-style-type: none"> <li>1. Remembering birthdays in the class  Treat the class for small things / amount if they really did a great job in a certain task.  Ex. Give them pens if someone answers a difficult question in the discussion, bring small treats such as chocolates. If</li> </ol>

		<p>it's a big event and they really put all their efforts into it, a great meal will do for a successful big class performance.</p> <p>3. Bonus points/extra grade can be a good gift, especially when doing it in a form of education game where everybody could have a chance for it.</p>
Acts of Service	<p>If you have a student who likes to serve in the classroom, ask them to provide help to their teacher or to their classmates (Jones, n.d.).</p> <p>Acts of Service is simply noticing what a person love to do and ask him/her to do it for someone else. This would be a good point and strategy to avoid complaints because the person is doing a voluntary task that she/he really likes (Egbert &amp; Polk 2013).</p>	<p>A seatmate feels loved when a friend offers a helping hand in things/task he/she needed to do and to finish.</p> <p>Ask a student to do the attendance</p> <p>Ask a student to lead the class if the teacher needs to go out in the classroom.</p>
Physical Touch	<p>Physical touch does not limit its coverage to hugs only. It has nothing to do with sexual expression. In a school setting, a pat on the shoulder and other friendly gestures, a simple handshake would already make the class feel loved (Chapman &amp; Freed, 2015).</p>	<p>If a student is defeated in a contest/failed an important exam, a simple pat on the shoulder will do.</p> <p>If a student achieves something, a simple handshake will do.</p> <p>If the teacher notices a student with a problem, ask a classmate in the same gender to provide a hug.</p>

**Note:**

*This table is part of the action plan. This serves as a guideline on how to use love languages as a way to increase intrinsic motivation in class. The left column shows the different types of love languages, the middle part indicates the definition of each love languages, and the right column lists the different activities and possible feedback that will help the teacher attend to the love languages portrayed by the students.*

## Appendix B

Name  
Course:

Signature:  
Date:

**The Five Love Languages Test**  
**for Intrinsic Motivation in the Classroom**  
**Adapted/Modified from Dr. Gary Chapman**

*Disclaimer: This test was adapted from Chapman 1992, questions were modified to suit for student's perspective towards classroom motivation.*

**Read each pair of statements and circle the one that best describes you.**

1. A. I like to receive notes of affirmation from my teacher.  
E. I like it when my teacher says I can do it.
2. B. I like to spend one-on-one time with my teacher to discuss my good and bad points in class.  
D. I feel loved when my teacher gives me practical help.
3. C. I like it when my teacher gives extra points.  
B. I like taking long talks with my teacher.
4. D. I feel loved when my teacher does things to help me in a difficult lesson.  
E. I feel loved when my teacher touches my head to say good job.
5. E. I feel loved when my teacher taps me on my shoulder to say you can do it.  
C. I feel loved when I receive a gift (extra grade) from my teacher.
6. B. I like to go school everyday because my teacher motivated me a lot.  
E. I like to talk to my teacher if I have a problem.
7. A. I feel loved when my teacher acknowledges me.  
C. Visible symbols of love (gifts) are very important to me.
8. E. I like to sit in front of the class.  
A. I like it when my teacher tells me that I am improving in class.
9. B. I like to spend time in school.

- C. I like to receive little gifts (ex. school supplies) from my teacher.
10. D. I know my teacher loves me when he/she gives some advice.  
A. My teacher's words of acceptance are important to me.
11. B. I like to be together with the whole class including my teacher when we do a difficult project.  
A. I like the kind words that my teacher says to me.
12. E. I feel whole when my teacher is concern with my grades.  
D. What my teacher does affect me more than what he/she say.
13. A. I value my teacher's praise and try to avoid his/her criticism.  
C. Several inexpensive gifts mean more to me than one large expensive gift.
14. E. I feel closer to my teacher when he/she tries to mingle with me.  
B. I feel close to my teacher when we are helping each other to fulfill a difficult project.
15. A. I like my teacher to compliment my achievements.  
D. I know my teacher love me when he/she tries to bring out the best in me.
16. E. I like my teacher to replies to me when I greeted him/her in the hallway.  
B. I like when my teacher listens to me sympathetically.
17. C. I really enjoy receiving extra points from my teacher especially when I did a task beyond his/her expectations.  
D. I feel loved when my teacher answers my queries with my difficult projects.
18. A. I like when my teacher compliments my appearance.  
B. I feel loved when my teacher takes time to understand my feelings.
19. E. I feel secure when my teacher assures me that I can do a difficult task.  
D. My teacher's acts of service make me feel loved.
20. D. I appreciate the many things that my teacher is teaching me.  
C. I like receiving words of encouragement from my teacher.

21. B. I really enjoy the feeling I get when my teacher gives me his/her undivided attention.  
D. I really enjoy the feeling I get when my teacher answers my queries in my difficult project.
22. C. I feel loved when my teacher greets me a happy birthday.  
A. I feel loved when my teacher starts the lesson with meaningful words (written or spoken.)
23. D. I feel loved when my teacher guides me out with my difficult project.  
C. I know my teacher is thinking of me when he/she is doing my grades.
24. C. I appreciate it when my teacher remembers my full name.  
B. I appreciate it when my teacher listens patiently and don't interrupt me when I am reciting in class.
25. B. I enjoy when my teacher gives his/her extra time for consultation.  
D. I like to know that my teacher is concerned enough to help me with my daily lesson.
26. E. Notice me unexpectedly especially when there is something new about me makes me feel loved.  
C. Giving me a little word of wisdom when I'm weak in class makes me feel loved.
27. A. I like to be told that my teacher appreciates me.  
B. I like for my teacher to look at me when I am talking.
28. C. My teacher's extra effort is always special to me.  
E. I feel loved when my teacher reminds me to distinguish good from bad.

# The effectiveness of Indigenous Filipino games (Play Therapy) on children with autism

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## Abstract

Identifying appropriate and suitable therapeutic approach for children with autism is a steadfast growing concern not only in the Philippines but across the globe. One of the emerging modalities that help children developed better relationship with others was play therapy. However, play therapy approaches were mostly inclined in the Western approach; thus, in this study, indigenous Filipino games such as patintero and tumbang preso were used. It aimed to determine the effectiveness of indigenous Filipino Games as one of the play therapy techniques for children with autism. The study used a single subject research design to 22 pupils enrolled in Francisco E. Barzaga Memorial School and Buro Elementary School Special Education Center in the City of Dasmariñas, Cavite. Respondents were selected through purposive sampling. A modified assessment tool that measures the social aspect domain of children with autism was implemented to obtain the initial, first month response to treatment and second month treatment. The data gathered were analyzed using the IBM SPSS Statistics 20. T-test for dependent sample was utilized in analyzing the initial, first and second month scores obtained by the respondents. The overall T-value for the first month was 3.872 which showed that there was a significant difference on the uses of the indigenous Filipino games, an overall T-value of 4.436 was computed showing a significant difference before and after two months' use of play therapy. The findings of the study indicated that using indigenous Filipino games as a tool for play therapy was effective and could improve the social aspect of children with autism.

**Keywords:** Autism Spectrum Disorder, Play Therapy, Indigenous Filipino Games, and Social Aspect Domain

## Introduction

Identifying appropriate treatment for children who suffer from neurodevelopmental disorder is a growing concern not only in the Philippines but across the world. Neurodevelopmental disorders are impairments of the growth and development of the brain or central nervous system. A narrower use of the term refers to a disorder of brain function that affects emotion, learning ability, self-control and memory and that unfolds as the individual growth. Autism Spectrum Disorder is considered as neurodevelopmental in origin that occurs in infancy and childhood characterized by communication deficits, such as responding inappropriately in conversations, misreading nonverbal interactions, or having difficulty building friendships appropriate to their age. Children with autism may be overly dependent on routines, highly sensitive to changes in their environment, or intensely focused on inappropriate items (DSM-5). Children with autism should undergo different therapies to improve the functioning of the individual; however, comprehensive therapies address the multiple areas of developmental differences (i.e. language, sensory, social, educational) in children with autism spectrum disorder (Campbell et al., 1996; Rogers, 2000).

One of the therapeutic approaches that help children form better relationships and attachments with others. Focusing on the nonverbal aspects of interaction. play therapy is widely used to treat children's emotional and behavioral problems because of its responsiveness to their unique and varied developmental needs. Most children below the age of 11 lack a fully developed capacity for abstract thought, which is a prerequisite to meaningful verbal expression and understanding of complex issues, motives, and feelings (Piaget, 1962). Thus, unlike adults who communicate naturally through words, children more naturally express themselves through the concrete world of play and activity. In play therapy, then, play is viewed as the vehicle for communication between the child and the therapist on the assumption that children will use play materials to directly or symbolically act out feelings, thoughts, and experiences that they are not able to meaningfully express through words (Axline, 1947; Kottman, 2001; Landreth, 2002; O'Connor, 2001; Schaefer, 2001). Play understanding, therefore, provided the means for insight, learning, problem solving, coping, and mastery. Play therapy is widely used among clinicians to treat a wide range of emotional and behavioral problems (Bratton & Ray, 2000).

Landreth (2012) defined play therapy as a dynamic interpersonal relationship between a child and therapist trained in play therapy, emphasizing the relationship as an essential element for therapeutic change. With the development of this safe relationship, the child has the opportunity to fully express and explore one's feelings,

thoughts, experiences, and behaviors. “Play provides a developmentally responsive means for expressing thoughts and feelings, exploring relationships, making sense of experiences, disclosing wishes, and developing coping strategies” (Landreth, 2012, p. 12). In play, children have the opportunity to make sense of their experiences and feel a sense of control of their world, which is vital to emotional development. Play therapy may be an effective treatment method for children on the autism spectrum due to their difficulties with verbal communication and reduced cognitive skills. From a child-centered perspective, children with ASD are challenged in relationships (Ray, Sullivan, & Carlson, 2012).

The indigenous Filipino games are games commonly played by children, commonly using native materials or instruments. In the Philippines, due to limited resources of toys, Filipino children usually come up with games that have no need for anything but the players themselves. The flexibility of a real human to think and act makes the game more interesting and challenging.

The researchers saw that most of the play therapy approaches being used in the Philippines were western in nature. As a result, they saw the need to craft a play therapy using the indigenous Filipino games not only to improve the social capability of the children with autism but also to inculcate the patriotism in every learner. In this study, the researchers sought to integrate the indigenous Filipino games as one of the play therapy techniques used for children with autism and thus create a program for children with autism that can be applied for special education (SPED) centers under the public-school system nearby in adopted barangays of the institution.

## **Methodology**

This study utilized an experimental research which used quantitative method of data collection. A single-subject research design was used in this study. According to Ottenbacher (1986), this research design allows for the documentation of therapeutic effectiveness of a continuous treatment with a specific client while taking into account data. The design included a baseline observation phase (A), first treatment phase (B<sub>1</sub>), and second treatment phase (B<sub>2</sub>).

The respondents of the study were pupils of Francisco E. Barzaga Memorial School and Burol Elementary School in the City of Dasmariñas, Cavite with an endorsed letter from the City Schools, Division of Dasmariñas. The respondents were chosen based on the following criteria (a) Clinically diagnosed with autism; (b) Level 2 “Requiring substantial support” (as cited on DSM-5, Table 2, page.52);

(c) Chronological age of 4 – 12 years old; and (d) currently enrolled in Special Education in the public school. Total enumeration was employed. However due to extraneous variables, the respondents were trimmed down to 22. The researchers gathered the parents and explained the study and gave an informed consent and statement of confidentiality.

To obtain the baseline, first month response to treatment and second month treatment, the researchers modified the assessment tool that measures the areas of social interaction, communication, imagination, restricted, repetitive, and stereotyped patterns of behavior, sensory, and theory of mind.

The play therapy session was conducted simultaneously for both schools for 30 minutes warming up, 30 minutes play therapy and 30 minutes wrapping up for twice a week for two months.

The data gathered were analyzed using the IBM SPSS Statistics 20. T-test for dependent sample was utilized in analyzing the initial, first and second month scores obtained by the respondents.

## Results and Discussion

Table 1

*Difference on the social aspects of children with autism before and after one (1) month use of play therapy*

Social Aspect Domains	Mean		T – Value	P – Value	Interpretation
	Initial	First Month			
Social Interaction	2.3139	1.9167	2.162**	0.045	Significantly Different
Communication	2.9817	2.6556	3.952**	0.001	Significantly Different
Imagination	3.6111	3.25	2.600**	0.019	Significantly Different
Restricted, repetitive and stereotyped patterns of behavior	3.3411	3.1189	2.133**	0.048	Significantly Different
Sensory	3	3.0444	- 0.482**	0.636	Not Significantly Different
Theory of the mind	2.8522	2.8339	0.097**	0.924	Not Significantly Different
<b>OVERALL</b>	<b>2.9644</b>	<b>2.7361</b>	<b>3.872**</b>	<b>0.001</b>	<b>Significantly Different</b>

On the first month of the use of play therapy, the overall obtained t – value was 3.872 and the p-value 0.001 at 0.05 significant levels, which showed that there was a significant difference on the level

of social aspect of children with autism before and after the therapy. Thus, the indigenous Filipino games or play therapy was effective for the first month of use.

Regarding the level of social interactions of children with autism, the obtained  $t$  – value was 2.162 and the  $p$  – value was 0.001 at 0.05 significant levels, showing that there was a significant difference on the level of social interactions of children with autism before and after the play therapy. Hence, the play therapy was effective in terms of social interactions for the first month of use.

In terms of communication of children with autism, the obtained  $t$  – value was 3.952 and the  $p$  – value was 0.001 at 0.05 significance, shows that there is a significant difference on the communication of children with autism before and after the play therapy. Thus, the one month use of play therapy or indigenous Filipino games was effective in this regard.

In imagination domain, the obtained  $t$  – value was 2.600 and the  $p$  – value was 0.019 at 0.05 level of significance. There was a significant difference on the level of imagination of children with autism before and after the play therapy. Hence, the one month use of play therapy was effective for improving imagination.

With regard to restricted, repetitive and stereotyped patterns of behavior, the computed  $t$  – value was 2.133 and the  $p$  – value was 0.048 at 0.05 significance, showing that there was a significant difference on the restricted, repetitive and stereotyped patterns of behavior of children with autism before and after the play therapy. Hence, one month use of play therapy was effective for restricted, repetitive and stereotyped patterns of behavior of children with autism.

In sensory domain, the obtained  $t$  – value was - 0.482 and  $p$  – value of 0.636 at 0.05 level of significance. Since the obtained  $p$  - value was greater than the level of significance, it can be concluded that there is no significant difference on the sensory domain of children with autism before and after the play therapy. Thus, the play therapy was not effective for the sensory domain of children with autism.

In the last category which is theory of the mind, the obtained  $t$  - value was 0.097 and the  $p$  – value was 0.924 at 0.05 significance. Again, the obtained  $p$  – value was larger than the level of significance; thus, there was no significant difference on the theory of the mind of children with autism before and after the play therapy. Thus, one month of play therapy was not effective for improving the theory of the mind of children with autism. Rubin (2012) described various developmental

functions of play for children. Cognitively, children develop methods of understanding and problem solving as they manipulate, organize, and eventually use objects to represent people, place, and things in their real and imagined worlds.

Table 2

*Difference on the social aspects of children with autism before and after two (2) month use of play therapy*

Social Aspect Domains	Mean		T – Value	P – Value	Interpretation
	Initial	Second Month			
Social Interaction	2.3139	1.5	4.790**	0.001	Significantly Different
Communication	2.9817	2.5306	5.175**	0.001	Significantly Different
Imagination	3.6111	3	3.716**	0.002	Significantly Different
Restricted, repetitive and stereotyped patterns of behavior	3.3411	3.2139	1.844**	0.083	Not Significantly Different
Sensory	3	3.3556	- 1.299**	0.211	Not Significantly Different
Theory of the mind	2.8522	2.7972	0.335**	0.742	Not Significantly Different
<b>OVERALL</b>	<b>2.9644</b>	<b>2.6744</b>	<b>4.436**</b>	<b>0.001</b>	<b>Significantly Different</b>

(\*\* 0.05 Level of Significance)

On the second month of the use of play therapy, the overall obtained t – value was 4.436 and the p-value 0.001 at 0.05 level of significance, there was a significant difference on the level of social aspects of children with autism before and after the therapy. Thus, the indigenous Filipino games or play therapy was effective for improving the social aspects of children with autism. As stated by Landreth, (2012), play therapy meets children at their level of development and allows them to express themselves in ways that are most comfortable.

Regarding the level of social interactions of children with autism, the obtained t – value was 4.790 and the p – value was 0.001 at 0.05 level of significance. This implies that there was a significant

difference on the level of social interactions of children with autism before and after the play therapy. Hence, play therapy was effective for social interactions.

In terms of communication of children with autism, the obtained  $t$  – value was 5.175 and the  $p$  – value was 0.001 at 0.05 significant levels, which showed that there was a significant difference between the communication of children with autism before and after the play therapy. Thus, play therapy using indigenous Filipino games was effective regarding communication. Children are able to communicate in ways they are most comfortable with, including nonverbal communication. This is particularly helpful for children with ASD, as they often struggle with communicating in ways that are understood by others. Through this safety and freedom of expression, children can engage and communicate with the play therapist in their own unique ways and eventually broaden that outward to their home and school environments with the relationship as the central aspect of the intervention (Landreth, 2012; Ray, 2011).

In imagination domain, the obtained  $t$  – value was 3.716 and the  $p$  – value was 0.002 at 0.05 level of significance, which shows that there was a significant difference on the level of imagination of children with autism before and after the play therapy. Hence, the Filipino indigenous games or play therapy was effective for improving imagination.

With regard to restricted, repetitive and stereotyped patterns of behavior, the computed  $t$  – value was 1.844 and the  $p$  – value was 0.083 at 0.05 significance. Since the  $p$  – value is greater than the level of significance, it can be concluded that there was no significant difference on the restricted, repetitive and stereotyped patterns of behavior of children with autism before and after the play therapy. Play therapy was not effective for restricted, repetitive and stereotyped patterns of behavior of children with autism.

In sensory domain, the obtained  $t$  – value was  $-1.299$  and a  $p$  – value of 0.211 at 0.05 level of significance. Since the obtained  $p$  - value was greater than the level of significance, this shows that there was no significant difference on the sensory of children with autism before and after the play therapy. Thus, the play therapy using indigenous Filipino games was not effective for the sensory of children with autism.

In the last category which is theory of the mind, the obtained  $t$  - value was 0.335 and the  $p$  – value was 0.742 at 0.05 significance. Again, the obtained  $p$  – value was larger than the level of significance; thus, there was no significant difference between the theory of the mind of children with autism before and after the play therapy. Indigenous Filipino games or play therapy was not effective for improving the theory of the mind of children with autism. Loveland (2005) summarized that

children with ASD may not respond to the distress of others due to a lack of awareness of others' emotional states or decreased ability to know how to respond empathically. Some researchers have connected empathy to Theory of Mind (ToM), which is one's ability to understand the feelings, intentions, and motivations of others (Baron-Cohen & Wheelwright, 2004). Rogers, Dziobek, Hassenstab, Wolf, and Convit (2007) stated that ToM is roughly equivalent to cognitive empathy but not to emotional empathy. Mindblindness is a term used to describe those without theory of mind, blind to others' thoughts, beliefs, knowledge, desires, and intentions (Baron-Cohen, 1995). Baron-Cohen, Leslie, and Frith (1985) conducted the first study of mindblindness in children with ASD. Since then, over 30 experimental studies have demonstrated impairments in the ability of individuals with ASD to empathize with others, including deficits in the following areas: joint attention, use of mental state terms in language, production and comprehension of pretense, understanding that seeing leads to knowing, distinguishing mental from physical entities, making the appearance-reality distinction, and understanding false belief. Thus, most researches agreed that in terms of Theory of Mind (ToM), children with autism still have difficulty comprehending when others do not know something. It is quite common, especially for those with savant abilities, to become upset when asking a question from a person he does not know the answer (Edelson, 2015).

## Conclusions

Based on the above results, the following conclusions were drawn:

1. From the initial (baseline) to the second month of the use of the play therapy, there were significant differences on the level of social interaction, communication, and imagination before and after the play therapy with  $t$  – values of 4.790, 5.175, and 3.716 and  $p$  – values of 0.001, 0.001, and 0.002, respectively, at 0.05 level significance. On the sub category of restricted, repetitive and stereotype pattern of behavior, sensory and theory of mind there were no significant difference before and after the therapy with the  $t$  – values of 1.844, 1.299, and 0.335 and the  $p$  – values of 0.083, 0.211, 0.742 respectively at 0.05 level significance. Overall, the level of the Social Aspect Domain has a significant difference before and after the therapy with a  $t$  – value of 4.436 and a  $p$  – value of 0.001 at the 0.05 level significance. Thus, the indigenous Filipino games are an effective form of play therapy that can be utilized by professionals who handle children with autism especially in special education centers.

2. Based on the above findings, it is concluded that the indigenous Filipino games as a form of play therapy for children with autism are

effective to enhance their skills in the Social Aspect Domain especially in the areas of social interaction, communication, imagination, and some restricted, repetitive and stereotype pattern of behavior. It can therefore be utilized by professionals such as teachers, special educators, psychologists and therapists who handle children with autism in their respective fields of expertise especially in special education (SpEd) center under the local public school in the Philippines. However, there are limitations on the use of said therapy such as it cannot be used for reducing sensory integration problems such as tactile (sense of touch), and auditory processing and enhancing the Theory of Mind such as thinking about the future and asking the meaning of life.

## **Recommendations**

Based on the above conclusions, the following recommendations were drawn:

1. For the school and teachers or professionals where the children with autism are currently enrolled, they can set indigenous Filipino games as part of the activities in the Special Education Center and also to mainstream (regular class). They can also utilize and enhance the evidence-based module/plan used during the therapy session for the children with autism and other related disorders as part of their therapy/session as well as teaching modules/plan. Through the use of the said therapy, the school may instill patriotism not only towards children with autism but also towards other students currently enrolled in the school.
2. For future researchers, they could conduct a follow - up study to test the reliability and validity of the research. Also, the future researchers could enhance it by adding more variables, respondents, having secured venue of the session, and using different approach in research such as a different research design which could help in the improvement and betterment of the lives of children/persons with Autism

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# Community based rehabilitation in the City of Dasmarinas, Cavite: Developing a basis for service framework and implementation strategy

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## Abstract

According to the WHO (2016), 10% of the world population are persons with disabilities. The World Disability Report in 2011 states that around 1 billion of the world's population has some form of disability, or about 1 in 7 people have some form of disability. The WHO introduced CBR after the Declaration of Alma-Ata in 1978 with the intention of improving access to health service and thereby enhancing the quality of life for persons with disabilities. Currently, Community Based Rehabilitation (CBR) is implemented in over 90 countries and it is continuously endorsed by the WHO. A preliminary study was conducted prior to the current study implementation, first to examine the needs of a sample of Dasmarininos (n=35), who had sustained serious disabilities and, second, to identify appropriate methods of delivering rehabilitation to these people. The methodology that was selected is known as the Modified Participatory Urban-Rural Appraisal (M-PURA). Results of the interviews shows that majority of the concerns of PWD's are based on government mandated services provided by the R.A 7277. Likewise, one prominent emerging theme presented was the limited number of rehabilitation facilities and specialists in the City who is willing to tie up and partner with the City to provide CBR. This further shows that there is a need to establish a CBR Center in the City of Dasmarinas in collaboration with the Disabled People's Organizations (DPO's) and the Local Government. In the Future Strategy Matrix, possible strategies that were explored were Private-Public Partnership to conceptualize the realization of the CBR Program/Center. The concept of Academe-LGU partnership was also explored to realize the establishment of a CBR Program and Center in the City of Dasmarinas, Cavite.

**Keywords:** PWD, CBR, Physical Therapy, Dasmarinas, Cavite

## Introduction

The Convention on the Rights of Persons with Disabilities (CRPD), defined persons with disabilities (PWD) as those who have long term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others (2012).

The International Classification of Functioning, Disability and Health (ICF) further defined Disability as an umbrella term for impairments, activity limitations and participation restrictions. It is also the interaction between individuals with a health condition (e.g. Cerebral palsy, Down syndrome and depression) and the personal and environmental factors (e.g. negative attitudes, inaccessible transportation and public buildings and limited social support).

Disability can occur at three levels namely:

- a. An impairment in body function or structure;
- b. A limitation in activity, such as the inability to read or move a round;
- c. A restriction in participation, such as exclusion from school or work.

According to WHO (2016), 10% of the world population are persons with disabilities. The World Disability Report in 2011 states that around 1 billion of the world's population has some form of disability, or about 1 in 7 people have some form of disability. Although PWDs have the same health care needs like other people, they are twice more likely to find inadequate health care providers who have the skills to address and respond to their needs and inadequate health care facilities, thrice more likely to be denied health and four times more likely to be treated badly in the health care system.

As stated by Yap et.al (2009), the Sustainable Development Goals (SDGs) of the United Nations recognizes the need to understand the link between disability and poverty. In fact, this has become one of the key issues in the subject of poverty reduction in Asia and the Pacific. The United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP) noted that persons with disability (PWD) often belong to the poorest segments of the population. To better understand the economic condition of PWDs, it is crucial that information about their economic activities and daily life is obtained. This information can serve as basis for the formulation of policies and intervention strategies

for the government, other stakeholders, and the international community.

Historically persons with disabilities have largely been segregated from society and the help they have received have been in institutions and special schools, Hamren (2015). The WHO introduced CBR after the Declaration of Alma-Ata in 1978 with the intention of improving access to health service and thereby enhancing the quality of life for persons with disabilities (2010). During the years CBR has developed and the CBR guidelines were developed after recommendations made in 2003 at the International Consultation to Review Community-based Rehabilitation in Helsinki and presented in 2010. The guidelines are based on the principles of the UNCRPD with two added principles; empowerment and sustainability, and according to the guidelines these principles should guide every CBR program. All CBR programs are supposed to focus on rehabilitation, poverty reduction, equalization of opportunities and social inclusion of all persons with disabilities through the combined efforts of the persons with disabilities, their families, organizations and communities, and the relevant governmental and non-governmental health, education, vocational and social services. UNCRPD (2006).

Currently, Community Based Rehabilitation (CBR) is implemented in over 90 countries and it is continuously endorsed by the WHO, seen here in this statement on disability by the World Health Assembly in 2013. “WHO urges member states to promote and strengthen integrated community-based support and services as a multi-sectoral strategy that empowers all persons with disabilities to access, benefit from, and participate fully in inclusive education, employment, and health and social services.

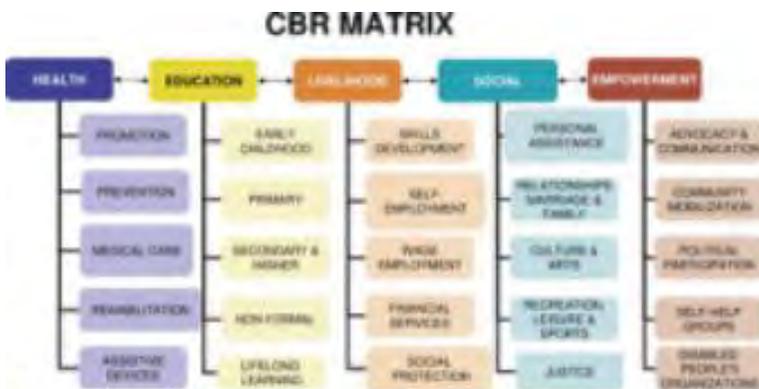


Figure 1. CBR Matrix (WHO, 1997)

Kuipers (2001) stated that typically, CBR projects start with the establishment of a local committee, identification of people with disabilities in a local area and the conducting of a needs analysis. Key community members are identified and approached to act as volunteer workers. Locally relevant disability training materials are usually developed from standard manuals. Training is provided to volunteers in the use of basic rehabilitation techniques and community development strategies. With occasional oversight from professionals, volunteers are assigned to work with a few people with disabilities and their families. In most instances, they conduct basic rehabilitation programs, monitor progress, train family members and develop an informal referral network.

The CBR approach has been reported to be instrumental in (Kuipers, 2001):

1. Demystifying the disability service delivery process, giving responsibility back to the individual, the family and the community.
2. Avoiding unnecessary compartmentalisation of services and subsequent optimization of health and welfare systems.
3. Raising awareness of the service needs of people with disabilities and enabling people to appreciate how these needs could be met within the community's own resources.
4. Promoting the visibility, participation, decision-making and social role of people with disabilities.
5. Identifying and reinforcing the resources of families and the local community.
6. Strengthening of the immediate community around the person with a disability and fostering of a greater sense of community responsibility and civic consciousness.
7. Achieving considerable physical, functional and psychological outcomes for people with disabilities, despite the informal, 'community' nature of supports.

Based on the May 2017 Census of Population and Housing (CPH), the province of Cavite posted a total population of 3,678,301 persons as of May 1, 2017, thus making the Cavite Province as the largest province when it comes to population. The province has a Proportion of persons with disabilities of 1.2 percent. PSA (2017)

The City of Dasmariñas is a first-class city in the province of Cavite, Philippines. Dasmariñas is the wealthiest local government unit in the province of Cavite according to the Commission on Audit report (2016). As of 2010, there are 88,646 persons with disability registered in the PWD registry of NCDA and Philippine Statistics Authority (PSA), 22,046 from the former Congressional District where Dasmariñas belongs prior to its cityhood. To date, there is still no updated data on the official number of PWD's in the City of Dasmariñas.

Accurate measurement and comprehensive collection of disability-related information are keys to better formulation as well as evaluation of appropriate government policies and programs for PWD and sustainable programs both by the government and non-government organizations (NGO's). Thus, this study aims to provide a strong foundation for the future establishment of a Community Based Rehabilitation Program in the City of Dasmariñas.

## **Methodology**

A preliminary study was conducted prior to the current study implementation, first to examine the needs of a sample of Dasmariñenos, who had sustained serious disabilities and, second, to identify appropriate methods of delivering rural rehabilitation to these people.

In-depth personal interviews were conducted with a small number of people with disabilities in Dasmariñas (n=35). As anticipated, commonly reported problems included mobility and access problems, geographical, time and vocational barriers, inadequate services and funding limitations. Interestingly however, respondents in these interviews also reported high levels of social assistance from neighbors and considerable support from community members. This study concluded that the appropriate rehabilitation service delivery models should seek to: (i) acknowledge the presence, role and value of skilled people who understand the local community; (ii) promote disability service skills among local community members; (iii) recognize the importance of and facilitate informal support processes; and (iv) more effectively bridge the cultural gap between the city and the bush.

A strong community-based approach was seen as a particularly constructive alternative to the traditional models of disability and rehabilitation service provision in rural areas. Similarly, Humphreys et al. (1999) concluded from their exploration of service frameworks that approaches to service delivery utilizing community-development principles would be more accessible for rural people and more responsive to the needs of rural communities. They suggested an approach in which

a community worker is trained to coordinate and develop the community's access to resources and to foster links within the community. Likewise, another study from Humphreys et al. (1999) anticipated that such a role would empower the community by involving them in service development and service delivery, thereby enhancing the sense of community. One such approach, in which service delivery is integrated with the community structure, is Community Based Rehabilitation (CBR).

The methodology that was selected is known as the Modified Participatory Urban-Rural Appraisal (M-PURA), an approach that has been found effective for implementing agricultural projects, promoting community development and developing ecological projects within rural-urban communities.

The M-PURA process has also been found to facilitate the exchange of knowledge and experience between rural communities and researchers and support the auditing and evaluation of projects. The success of M-PURA may result from the fact that it is seen as an important tool for assisting communities to learn new approaches and take an active role in local development projects.

The M-PURA Methodology adopted from Xiang (1995), may be seen as a research and development 'style' (i.e. a learning outsider working with a community to enable them to explore issues at a local level) rather than a formal method in which an expert employs certain development techniques. Participatory Urban-Rural Appraisal is characterized by:

1. The use of group processes and community-level interactions (rather than individual interpretation) to share information, collect data, promote analysis of the information and encourage community action.
2. A long-term 'time-extensive' rather than 'time-intensive' approach.
3. Recognition that community-based action is a multi-tiered process involving: (i) awareness-raising; (ii) building trust; (iii) community-organizing; (iv) designing local plans; and (v) effecting change.
4. The use of visual representations of concepts at local community meetings ('maps' and graphic representations of social and other phenomena). These visual tools, when developed by community members and used appropriately, legitimize local knowledge, promote empowerment and enable creative strategies to be developed by participants.

5. A reliance on **qualitative data and triangulation** (exploring an issue or question through a number of different methods and from different sources).

Tjandrakusuma (1995), emphasized that M-PURA is an approach for sharing learning between local people and outsiders.

As a process, it seeks to be flexible rather than rigid, visual rather than verbal and based on group rather than individual analysis. Finally, there are indications that the M-PURA approach is suited to the area of community disability service development.

Total Population of Persons with Disabilities in the City of Dasmariñas is 22,046 (PSA, 2010). Out of the 80 Barangays, the Top 5 Barangays with Largest Population were selected by the Researchers to as follows:

1. Salawag
2. Burol Main
3. Sabang
4. Paliparan II
5. Langkaan II

Initially, the researchers established contact with these communities through their local leaders. After discussion with the community leaders, students enrolled under the subject Introduction to Community Based Rehabilitation (CBR) of the School of Physical Therapy performed the interview supervised by the main researcher. Likewise, these students were trained and supervised in interviewing, data collection, maintaining confidentiality and the research process. They are also trained in basic skills in human service provision and community development through relevant lectures and community activities.

The study underwent approval of the Institutional Research Ethics Board. The M-PURA Model to be implemented was externally validated by an expert Physical Therapist practicing in the Community Setting from the UP College of Allied Medical Professions.

## **Results and Discussion**

### **(THREE – PHASE M-PURA MODEL)**

Majority of the respondents came from Paliparan II, which coincidentally, is the most densely populous area in the City of

Dasmarinas.

A Study by Parson (2013) stated that placing the center in the most densely populated location in the city will be of benefit to spread the news of the availability of such services to the other neighboring locale.

Table 1

*Total Participants per locality*

*Phase 1: Entry to the community (Community Survey)*

Barangay	Frequency	Percentage
Salawag	40	19.60%
Burol Main	56	27.50%
Sabang	34	16.70%
Paliparan II	51	49.00%
Langkaan II	23	11.30%
TOTAL	204	100%

*Phase 2: Conducting interview on local disability issues and concerns*

<b>Strengths</b>	<b>Weaknesses</b>
1. Presence of policies, laws that support the rights and privileges of PWDs	1. Not a priority program (not included in the MDG, NOH)
2. Online registry available for registration of PWDs	2. No updated definition of PWD
3. 1% of agency's budget for Senior citizen and PWD	3. Not commonly noticed and given concern by the current City Administration
<b>Opportunities</b>	<b>Threats</b>

Table 2

*Complied Emerging Themes from SWOT Analysis by Community Members*

<ol style="list-style-type: none"> <li>1. Multi-sectoral approach for co-ownership and co-creation to address issue on disability inclusiveness.</li> <li>2. Presence of Disabled People’s Organizations, NGOs focused on PWDs willing to partner with DOH</li> <li>3. Presence of MHOs, PHNs, and BHWs in the City</li> </ol>	<ol style="list-style-type: none"> <li>1. Poor compliance to and implementation of the policies and laws on rights and privileges of PWDs.</li> <li>2. Limited number of rehabilitation facilities and specialists in the City who is willing to tie up and partner with the City to provide CBR.</li> <li>3. Poor accessibility in terms of distance, physical structures and assistive devices</li> <li>4. Limited training to address per type of disability.</li> <li>5. Attitudinal barriers like poor health, behaviors, stigmatization, unresponsive workers</li> </ol>
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The researchers slowly took on the major role of obtaining primary information, which involved conducting face-to-face structured interviews with local people with disabilities and their family members. The researchers also conducted structured interviews with relevant community stakeholders (disability service providers, medical and health services, community, services and social services). Information from these structured interviews was combined with other locally relevant information on disability. These data provided the basis for the community needs assessment and indicated the level of community commitment to disability issues.

Results of the interviews shows that majority of the concerns of PWD’s are based on government mandated services provided by the R.A 7277. Likewise, one prominent emerging theme presented was the limited number of rehabilitation facilities and specialists in the City who is willing to tie up and partner with the City to provide CBR. This further shows that there is a need to establish a CBR Center in the City of Dasmariñas in collaboration with the Disabled People’s Organizations

(DPO's) and the Local Government.

### Phase 3: Formulating the Future Planning Matrix

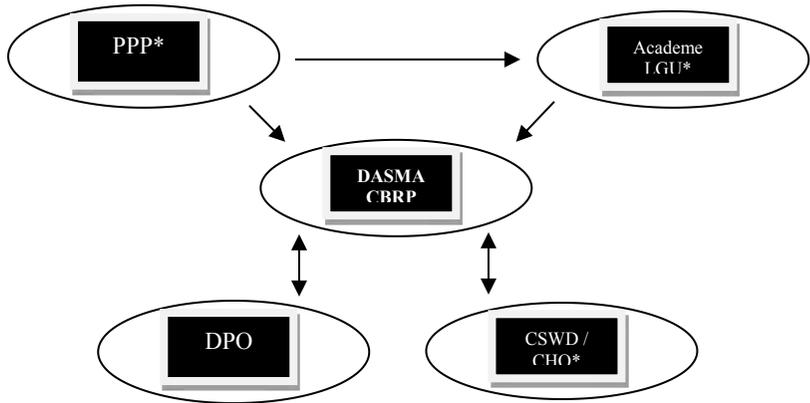


Figure 2. Future Planning Concept Map

The resultant information from the emerging themes was then into a ‘future planning map’. This map enabled the researchers to identify and contextualize the needs of people with disabilities in the City of Dasmariñas.

A number of strategies were then identified that were relevant to that community. These were again prioritized and combined with previous information to form the ‘future planning matrix’.

Possible Strategies that were explored were Private-Public Partnership to conceptualize the realization of the CBR Program/Center. The concept of Academe-LGU partnership was also explored. In a study protocol conducted by Trinidad et.al (2017), effective CBR programs are brought about by a harmonious Academe-LGU partnership due to their bilateral support to policy making initiatives to improve disability prevention. All of these initiatives must be in close coordination with the CSWD and CHO.

## **Summary and Conclusion**

The current paper has outlined a pilot study that is presently being conducted in the City of Dasmariñas. This pilot represents an attempt to utilize and integrate an approach to rehabilitation that has been used in developing countries (CBR) through an adaptation of an appropriate implementation methodology (M-PURA). The use of the M-PURA methodology has facilitated a degree of community ownership of disability issues and is resulting in service responses that are appropriate to the local community.

While the results of the implementation and findings of the evaluation are solely based on strong qualitative data and triangulation, it appears that the combination of a CBR conceptual framework and a M-PURA Implementation strategy is resulting in:

1. A sustainable service model to respond the needs of people with disabilities.
2. Greater community awareness of disability issues.
3. More community support for people with disabilities and their carers.
4. More effective networking and coordination between community members.
5. Greater informal and community supports for people with disabilities.

For the research and rehabilitation community in general, the project will represent a practical demonstration of the utility, limitations and strengths of these approaches. In the end, the viability of a Community Based Rehabilitation Center in the City of Dasmariñas is of endless possibility.

## **Acknowledgement**

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2. EACC School of Physical Therapy Faculty and Students for their support in this study.

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# Exploring the linearity between blood smear and electric-impedance derived platelet counts in normal and dengue hemorrhagic fever seropositive patients

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## Abstract

This paper explored the linear relationships between the blood smear and electric-impedance derived platelet counts in normal and dengue hemorrhagic seropositive patients. Anticoagulated whole blood samples of 30 dengue hemorrhagic fever seropositive patients and 30 normal patients were collected in the study. The platelet counts of these patients were analyzed using the automated hematology analyzer with electric impedance-based as principle. Wright-stained blood films of these patients were also prepared, and the platelet counts were read by two medical technologists. The results obtained in the machine generally agree with the readings of the two medical technologists,  $r(60) = .835$ ,  $p = .000$  and  $r(60) = .848$ ,  $p = .000$  for MT1 and MT2, respectively. The results were also consistent among patients who were seropositive with dengue hemorrhagic fever where the results obtained in the machine strongly correlated with the readings of the two medical technologists,  $r(30) = .840$ ,  $p = .000$  and  $r(30) = .848$  for MT1 and MT2, respectively. However, the platelet counts of the machine did not correlate with the readings of the two medical technologists in normal patients,  $r(30) = -.045$ ,  $p = .819$  and  $r(30) = -.044$ ,  $p = .812$ , for MT1 and MT2, respectively. Their findings affirmed many literatures regarding the inconsistent platelet count results obtained from automated hematology blood analyzer particularly those that utilized electric impedance. Hence, it is essential to find an alternative automated reference method for platelet count. Moreover, this study also espoused the standardization of platelet counts derived from Wright-stained peripheral blood smear.

**Keyword:** Platelet counts, Electric impedance, Platelet estimate, Manual platelet count

## Introduction

One of the procedures in hematology laboratory that lacks standardization is the blood smear derived platelet count. This procedure has a very high degree of inter-operator errors and is poor in precision (Harrison et al, 2000). Moreover, the limits of analytical procedure for manual platelet counts are also not yet established (Hanseler, 1996). However, platelet estimation through blood smear remains popular as it is rapid, cheap and does not require expensive machine (Bajpai et al, 2015). Estimation of platelet counts from blood smear is still essential despite its lack of precision. Such is necessary particularly in cases of erroneous automated platelet counts (Brahimi et al, 2009).

Automated blood analyzers are known to give reliable results except for platelet counts especially during severe cases of thrombocytopenia (Segal et al, 2005). Although the phase contrast microscopy remains the gold standard or the reference method for manual platelet count, flow cytometry has been advocated to be the potential reference method by the International Council for Standardization in Hematology (ICSH) Expert Panel on Flow Cytometry (Harrison et al, 2001). The traditional method for automated hematology analyzers utilized the principle of electrical impedance or also known as the Coulter principle where cells such as platelets are allowed to pass between two electrodes through an aperture so narrow that only one cell can pass through at a given time (Skoffin, 2014). The passing of each cell will cause an impedance that is directly proportional to cell volume and cell count. This remains a powerful technology since the counting rates is approximately 10,000 cells per seconds and a typical impedance analysis is achieved within a minute (Skoffin, 2014).

Diagnosis of thrombocytopenia due to dengue hemorrhagic fever mainly relies on laboratory results. Accurate diagnosis of the said condition is important particularly for the management of patients with thrombocytopenia (Izak and Bussel, 2014). In this study, the linearity between the manual blood smear derived platelet counts performed by experienced medical technologists were compared with the counts obtained in automated hematology analyzer that utilized electric impedance as principle.

## Methodology

This correlational study was conducted in October-November 2016 in a tertiary hospital in the City of Dasmarinas, Cavite. A total of 60 whole blood samples were obtained from normal (n=30) and dengue hemorrhagic fever seropositive patients (n=30). The platelet count of

each blood sample was obtained by manual estimation in blood smear and by automated hematology analyzer. The study was approved by the Ethics Committee of the Faculty of Biomedical Science in Emilio Aguinaldo College-Cavite.

#### *Peripheral Blood Smear Derived Platelet Count*

Estimation of platelet count was conducted by two staff registered medical technologists from the said hospital. The platelets were counted in the Wright-stained blood film of the patients. The average counts of the 10 fields were multiplied by 17 (IPEF factor). The readings of the two registered medical technologists had an almost perfect interrater correlation coefficient ( $r=.997$ ). The medical technologists have eight and 12 years of clinical laboratory practice.

#### *Hematology Analyzer Derived Platelet Count*

Whole blood obtained from the patients were placed in an EDTA anticoagulated tube. Platelet counts were analyzed in Marsman Coulter HMX machine. The analyzer utilized the volume, conductivity and scatter (VCS) technology for analyzing blood cells. The specific principle being used for counting platelets under the VCS technology is electric impedance.

#### Data Analysis

All data were tabulated and processed using a licensed SPSS v. 22. Pearson correlation and simple linear regression were utilized to determine the relationships and the correction factor between the manual and automated platelet counts, respectively. One-way ANOVA was also utilized to determine differences in the mean platelet counts across the three readings.

## **Results and Discussion**

### Overall Linear Relationships between Blood Smear and Electric Impedance Derived Platelet Counts

Figure 1 indicates the overall linear relationships between the blood smear and electric impedance derived platelet counts. The overall mean platelet count ( $n=60$ ) obtained from the automated hematology analyzer was  $140.10 \times 10^9/L$ ,  $SD=72.21$ . The blood smear derived mean platelet counts from two medical technologists were  $224.97 \times 10^9/L$ ,  $SD=101.05$  and  $224.93 \times 10^9/L$ ,  $SD=99.12$  respectively. Furthermore, multiple correlation revealed electric impedance derived platelet counts had

positive strong linear relationships with medical technologist 1 (MT1),  $r=.835$ ,  $p=.000$  and medical technologist 2 (MT2),  $r=.848$ ,  $p=.000$ . This gave a coefficient of determination of 70% and 72% for MT1 and MT2, respectively. Thus, 70% and 72% of the variations in automated hematology blood analyzer could be explained by the linear relationship between the automated hematology blood analyzer and the platelet estimates of MT1 and MT2, respectively.

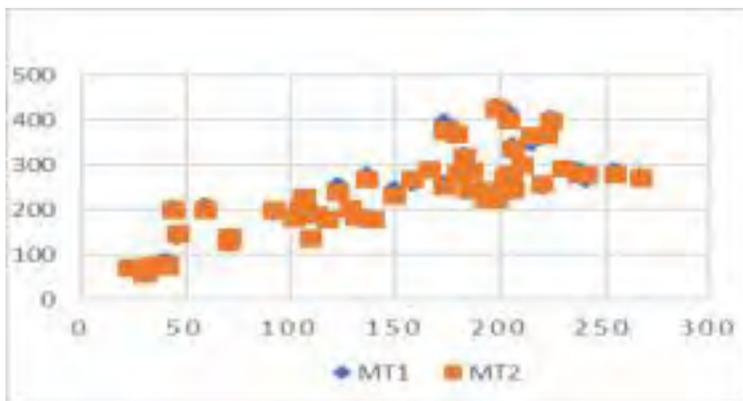


Figure 1. Overall linear relationships among electric impedance derived platelet counts and blood smear derived platelet counts obtained by two medical technologists

The findings were in congruent with the findings of Al-Hosni et al (2016) where their manual platelet count had strong correlation coefficient ( $r=.843$ ) with the machine derived platelet count. Their findings affirmed the reproducibility of manual platelet counts across clinical conditions of the patients. Experience in manual platelet counts and pertinent trainings were among the factors mentioned to be a significant factor in coming up with reproducible results. Moreover, simple linear regression analysis revealed that the blood smear derived manual platelet counts performed by the two medical technologists could significantly predict the results of impedance derived platelet count. The standard equation model is  $\alpha=-3.790 + 2.686 - 1.843$ .

#### Linear Relationships Between Blood Smear and Electric Impedance Derived Platelet Counts in Dengue Hemorrhagic Fever Seropositive Patients

Shown in Figure 2 are the blood smear and electrical impedance derived platelet counts from patients with thrombocytopenia.

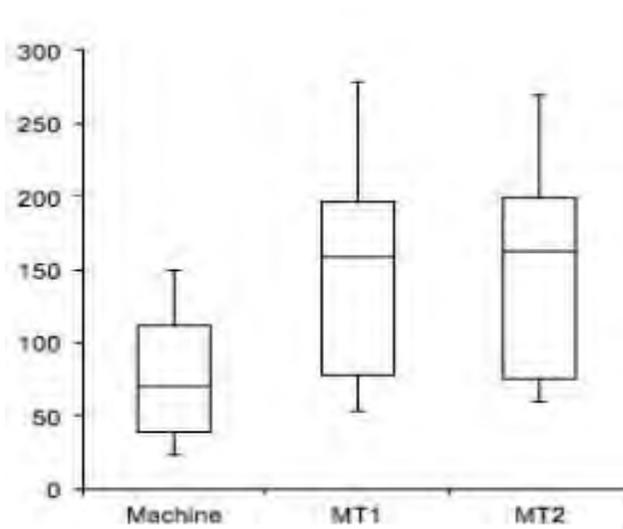


Figure 2. Platelet counts obtained from dengue hemorrhagic fever seropositive patients (n=30)

The mean platelet counts (n=30) obtained from the automated machine using electrical impedance as principle was  $77.0 \times 10^9/L$ ,  $SD=41.75$ . On the other hand, blood smear derived platelet counts had a mean of  $147.43 \times 10^9/L$ ,  $SD=67.78$  and  $146.27 \times 10^9/L$ ,  $SD=65.41$ . One way ANOVA further revealed that these results were significantly different,  $F(87,2)=13.91$ ,  $p=.000$ . Thus, the platelet counts derived from the machine are significantly lower when compared to the manual platelet counts. The finding was inconsistent with the findings of Boulassel et al (2015) who postulated that platelet counts derived from machine that utilized electrical impedance tended to be overestimated in thrombocytopenic patients. However, in this study, the counts from automated analyzer are significantly lower than the blood smear derived platelet count manually obtained by the two medical technologists. Low platelet counts were expected in this sampling population since thrombocytopenia was expected among patients who are seropositive with dengue hemorrhagic fever.

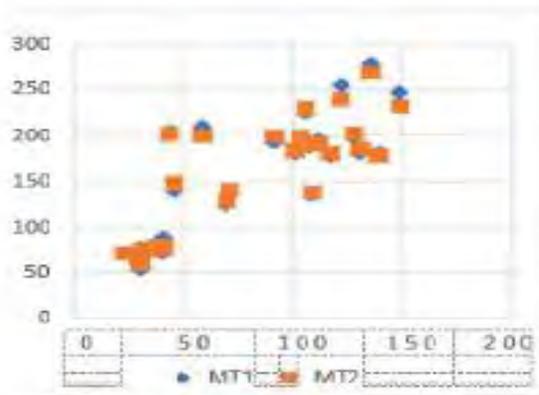


Figure 3. Linear relationships between the electrical impedance and blood smear derived platelet counts among patients who are seropositive with dengue hemorrhagic fever (n=30)

It can be gleaned in Figure 3 that despite significant differences in platelet counts, multiple correlation revealed electric impedance derived platelet counts had positive strong linear relationships with medical technologist 1 (MT1),  $r=.840$ ,  $p=.000$  and medical technologist 2 (MT2),  $r=.848$ ,  $p=.000$ . This gave a coefficient of determination of 71% and 72% for MT1 and MT2, respectively. Thus, 71% and 72% of the variations in automated hematology blood analyzer could be explained by the linear relationship between the automated hematology blood analyzer and the platelet estimates of MT1 and MT2, respectively. The results did not agree with the findings of Ninama and Shah (2014) where they reported that platelet counts based from electric impedance would not usually correlate or agree with the readings coming from peripheral blood smear in cases of microcytosis and thrombocytopenia.

In this study, however, despite the differences in the mean platelet counts, the manual platelet estimates done by the two medical technologists had positive strong linear relationships with the readings obtained by the said hematology analyzer. It is also interesting to take note that the manual readings of the two medical technologists are precise as they strongly agree with one another,  $r=.996$ ,  $p=.000$

#### Linear Relationships Between Blood Smear and Electric Impedance Derived Platelet Counts in Normal Patients

Figure 4 depicts platelet counts obtained from normal patients across three readings. The mean platelet counts (n=30) obtained from the automated machine using electrical impedance as principle is  $203.0 \times 10^9/L$ ,  $SD=26.11$ . On the other hand, blood smear derived platelet counts

had a mean of  $302.5 \times 10^9/L$ ,  $SD=61.19$  and  $302.6 \times 10^9/L$ ,  $SD=56.62$ . One way ANOVA further revealed that these results are significantly different,  $F(87,2)=38.84$ ,  $p=.000$ . Thus, the platelet counts derived from the machine were significantly lower as compared to the manual platelet counts.

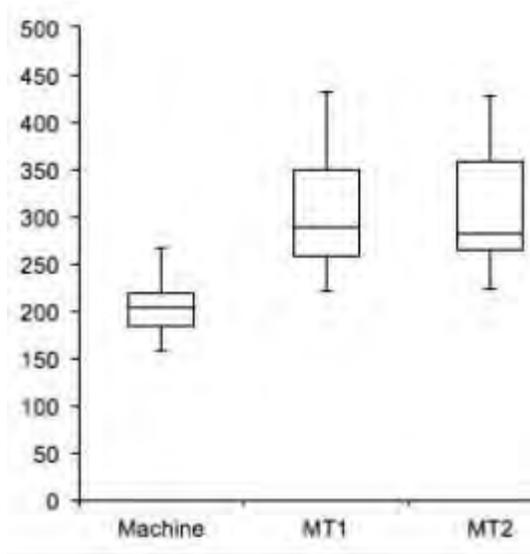


Figure 4. Platelet counts obtained from normal patients

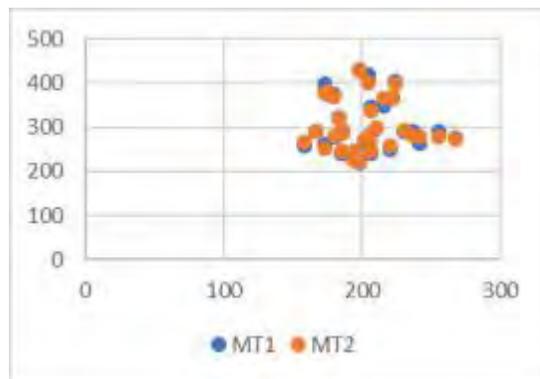


Figure 5. Linear relationships between the electrical impedance and blood smear derived platelet counts among normal patients (n=30)

Furthermore, Figure 5 shows the relationship between the platelet counts derived from the electric-impedance based hematology analyzer and manual readings of the two medical technologists in a Wright-stained peripheral blood smear from normal patients. Pearson correlation revealed that hematology analyzer did not agree with the readings of the two medical technologists with a correlation coefficient of  $r=-.044$ ,  $p=.819$  and  $r=-.045$ ,  $p=.812$  for MT1 and MT2, respectively. These findings were in contrast with the findings from patients who were seropositive with dengue hemorrhagic fever. The findings of the research affirmed the findings of Kim et al (2010) regarding the inconsistency of automated hematology blood analyzers that utilized either the electric impedance or optical principles. In normal patients, other factors such as small and hypergranular platelets may also contribute to erroneous platelet counts (Kim et al, 2010). Thus, examining peripheral blood smear remained invaluable particularly for confirming cases of unexplained pseudothrombocytopenia (Adewoyin and Nwogoh, 2014). Normal patients in this study significantly have lower platelet readings obtained from the machine as compared with the peripheral blood smear derived platelet counts. Also, the two medical technologists who manually read the peripheral blood smear had precise readings as their counts strongly agree with each other,  $r=.991$ ,  $p=.000$ . This affirmed the importance of interrater reliability in platelet counts and particularly for confirming cases of thrombocytopenia at critical level (Crowther et al, 2009 and Dore et al, 2014).

## Summary and Conclusion

The platelet counts obtained by the automated hematology analyzer that utilized electric impedance as principle was generally lower the readings in the Wright stained peripheral blood smear. Although there was a significant difference in the platelet counts across the three results, there was also a strong correlation in the platelet count readings of the machine and the two medical technologists among patients that were seropositive with dengue hemorrhagic fever. However, no correlation between the platelet counts obtained by the machine and the two medical technologists was seen using the blood samples of normal patients. Our study affirmed most of the findings in the literature regarding the inconsistent results obtained by the automated hematology analyzer for platelet counts. However, in this modern time when rapid results are vital for patient management, it is essential to find automated reference method for platelet count aside from the existing Brecker-Cronkite method for platelet counts. Flow cytometry is seen to be an alternative gold standard, but most of the laboratories in the Philippines are still utilizing electric impedance-based analyzers for platelet counts. It is also vital to standardize the manual peripheral blood smear platelet count

procedures as it is the widely-used method for platelet estimates in the Philippines.

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# **Risk estimates for the occurrence of toxoplasma antibodies in a cohort population of abattoir workers in Imus, Cavite, Philippines**

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## **Abstract**

This study aimed to determine the risk estimates for the seroprevalence Toxoplasmosis among abattoir workers and livestock in selected slaughterhouse in Imus, Cavite. Variables such as host related and cultural factors served as indicators of possible risks association with toxoplasmosis among livestock and abattoir workers were elucidated. Study population consisting of butchers and livestock including their activities, frequency of work contact with raw meat, history of occupational exposure to raw meat in other work place and habitual use of safety practices were included in the study. Traditional approach in the diagnosis of toxoplasmosis including etiological and immunological techniques were pertinent to the study. These techniques provided the foundations for development of more effective and accurate detection of infection and contributed to the basic knowledge on epidemiology, prevention and control of toxoplasmosis. Results showed that moonlighting experience had a relative risk of 6.1333 times more likely to have infection compared to workers with no moonlighting experience. Not wearing of goggles during work period had a relative risk of 4.500 time more than who wear PPE such as goggles. Occupational exposure such as animal raiser had a relative risk of 2.917 times more that non-animal raiser. However, further investigation investigations need to be performed to elucidate conditions associated with disease occurrence.

**Keywords:** Abattoir, Risk estimate, *Toxoplasma*, Cohort

## Introduction

Occupational exposure to slaughtered animals or livestock could represent health hazard for zoonotic infections. Infections with *Toxoplasma gondii* (*T. gondii*) may cause asymptomatic latent infections, morbidity or mortality in both humans and animals (Dubey 2009). One of the routes of infection is through ingestion of undercooked or raw meat containing cyst and ingestion of oocysts (e.g. when handling soil or cat litter, via water, ingestion of raw or undercooked meat or on unwashed vegetables). *T. gondii* is one of the most important foodborne pathogens warranting the implementation of intervention measures. Meat appears to be a major source of *T. gondii* infections in other countries. To gain more insight into the role of meat as a source of human infection with *T. gondii*, it is important to have an indication on the prevalence of infectious tissue cysts in the main livestock species.

*Toxoplasma* is a protozoan parasite belonging to the Phylum Apicomplexa and is infectious to practically all warm-blooded animals, including humans, livestock, birds and marine mammals. Among the protozoan parasites that affects humans it is the most widely spread. It has been estimated that around 1 to 2 billion of the world's population is infected by it. (Montoya and Liesenfeld 2004). In Asia, infection rates vary from less than 10% to over 70% (Guy, Dubey and Hill, 2012). It should be emphasized that toxoplasmosis does not manifest clinical illness or appear to have subclinical manifestations.

Parasite factors were due to environment where oocyst can survive and low occurrence during dry season (Gebremedhin EZ et al 2013; Zewdu E et al 2012). Zewdu E et al 2014). Other contributing factors in the occurrence could be attributed to the presence of viable tissue cyst in ruminant posing potential threat to consumers. Toxoplasma antibody in workers maybe classified by duration of employment with five (5) years and over or less based on the study of J Uoeh (2001). The presence of toxoplasma infection in meat animals may be due to cultural factors regarding meat consumption and meat preparation. Other risks factors may be due to age and immunological status of the person exposed to meat products (Dubey, 2009a; Guy, Dubey and Hill, 2012). More so, all edible portions of livestock animals can harbor viable toxoplasma cysts. However, occurrence may increase risks factors when meat products are consumed when undercooked; even organic pork may represent infection route (Dubey *et al.*, 2012).

Clinical features of an infected person according to some studies were influenced by the immune status and the virulence strain of toxoplasma parasite which may cause mild to moderate illness. Some clinical symptoms like low fever, lymphadenopathy, fatigue, muscle pain,

sore throat and headache may be seen in an infected individual. Evidence of such subclinical or clinical signs indicates that this parasite is of increasing importance especially among abattoir workers which may have potential to spread with traded products of meat and animals.

Serological assays have developed to detect different antibody classes or antigens. Detection of IgM alone would not be sufficient to establish an acute infection (Quan, et al 2015). Presence of IgG antibodies suggested occurrence of infection but not the information about the time of infection. However, IgA served as the marker for acute infection which produced earlier than the occurrence of IgM that persists for several months.

This study aimed to determine the seroprevalence Toxoplasmosis among abattoir workers and livestock in a slaughterhouse in Cavite. Definitive host related variables (presence of cats or on farm detection of *T. gondii* oocysts) and factors that serve as indicators of possible fodder contamination almost always associated with an increased risk of *T. gondii* positivity in farm animals (studies in pigs and cattles) were elucidated.

## **Methodology**

This case control study was carried out from the months of September 2016 to January 2017. A number of study animals were randomly selected based on the number of expected number of pigs and cattle scheduled to be slaughtered in the abattoir. The study was conducted with the approval of the City Veterinary Officer of the City of Imus, Cavite.

The study was approved by the Ethical Committee of the Faculty of Biomedical Science in Emilio Aguinaldo College-Cavite. The purpose and procedures of the study were explained to all participants and a written informed consent was obtained from each of the volunteer abattoir workers.

### **Target animals**

The main target was slaughtered animals such as pigs and cattle, all in age males and of less than one year. In this study, few females were sampled because females are normally kept for breeding purposes. Age was determined by observation of the erupted permanent incisors. Animals less than one year were considered as young while those above one year were considered adults.

### *A. Sample collection for animals*

A total of 50 blood samples from slaughtered animals such as pigs and cattle were randomly selected from different slaughter-house in Cavite. Blood samples were collected by jugular venipuncture after they were slaughtered immediately in slaughterhouses. Blood samples were properly labeled and the sera were separated by centrifugation at 3200 RPM for 10 minutes. The extracted sera were transferred to other sterile vials and kept at 4-6°C until serologically assayed.

### *B. Sample collection for abattoir workers*

The study population consisted of butchers who had worked as butchers in abattoirs or butcher's shops for at least 6 months and were aged 18 years. The control group was drawn from the general population and matched with meat workers by age, gender and length of working experience.

This study explored the characteristics of the participants with the aid of a standardized questionnaire. Socio-demographic data including age, gender, and length of experience as abattoir worker was included in the analysis. Work data included seniority (number of years) in the activity, frequency of work contact with raw meat, type of animals ever slaughtered, most frequent type of animals slaughtered, history of occupational exposure to raw meat in other city and habitual use of safety practices (use of hand gloves, masks and safety glasses). Questions were asked to assess routes of exposure (ingestion, percutaneous injury and mucosal splashes), about eating while working, washing hands before eating, eating raw meat at work, ever having suffered from injuries with a sharp tool at work and having had splashes of blood or raw meat in the face.

Contributing and confounding risk factors of behavioral data from all participants were also obtained. These factors included animal contacts, contact with cat feces, meat consumption (pork, beef, goat, sheep, chicken, turkey, or other), degree of meat cooking, consumption of unpasteurized milk, dried or cured meat (ham, sausages, salami, chorizo or dried beef), unwashed raw vegetables, fruits or untreated water, frequency of eating out of home (in restaurants or fast food outlets) and contact with soil (gardening or agriculture).

Clinical data included currently suffering from any disease, presence or history of lymphadenopathy, frequent presence of headache, history of blood transfusion, transplant or surgery and memory. Reflexes, hearing and visual impairments were also considered.

### C. IgG/IgM Immunoassay

The onsite Toxo IgG/IgM a lateral flow chromatographic immunoassay, consists of monoclonal anti-human IgM for detection of IgM anti-*T. gondii* and pre-coated reagents for detection of IgG anti-*T. gondii* were utilized for detection of antibodies. Serum samples collected from livestock and human were tested using this latex agglutination test.

### Data statistical analysis

All data were recorded and data analysis was done using IBM software SPSS version 22. Demographic profile of age and length of experience was determined by percent frequency distribution. Risk estimates and odds ratio for the occurrence of toxoplasma antibodies were analyzed by using SPSS v 22

### Results and Discussion

A total of 38 abattoir workers who voluntarily participated in this study were residents of Cavite. Among the volunteer workers, 32% (n=12) have more than 5 years of experience, 26% (n=10) with less than one-year experience, 24% (n=9) with 4 to 5 years of experience and 18% (n=7) with one to 3 years of experience in abattoir as shown in Figure 1.

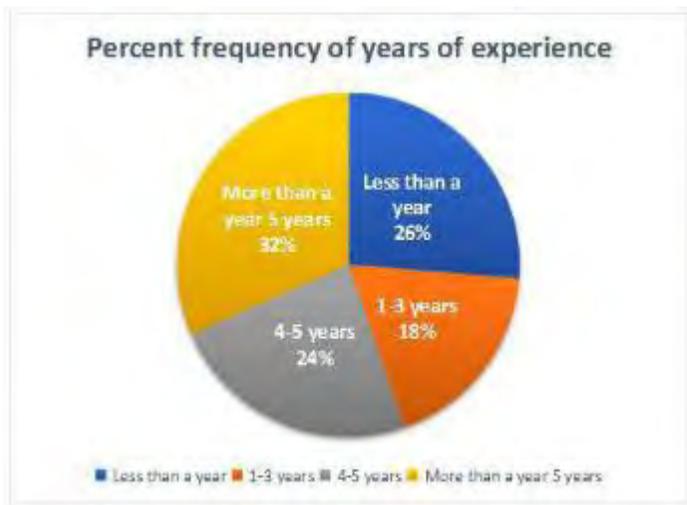


Figure 1. Frequency of Years of Experience in Abattoir

In this study, IgG/IgM chromatographic immunoassay was used for detection of *Toxoplasma* antibodies. The gold standard for detecting *Toxoplasma* antibodies is the use of Sabin-Feldman dye test. However, it is too expensive and not routinely used in epidemiological studies.

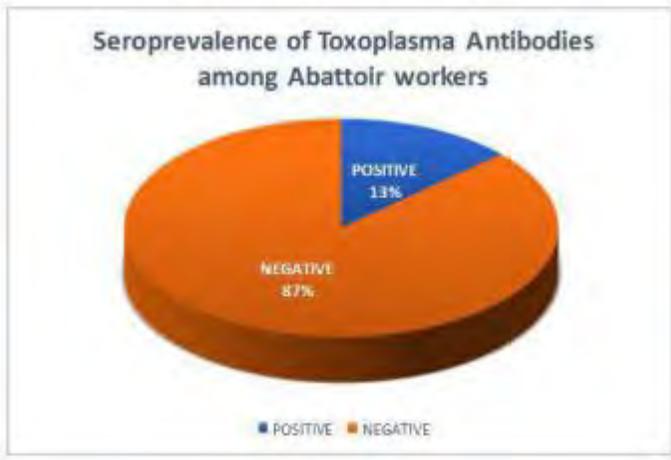


Figure 2. Percent Prevalence of Toxoplasmosis among Abattoir Workers

Results revealed that 5 (13%) of the 38 butchers were positive for anti *T. gondii* IgG antibodies while 33 (87%) were negative as shown in Figure 2. Positive result in IgG as initial test for the presence of *Toxoplasma* determination of the immune status may indicate current or past infection with the organism (McAuley JM *etal* 2015). Since IgM in the test kit was found to be negative, this may exclude recent infection because *Toxoplasma*-specific IgM antibodies may be detected by Enzyme Immunoassay (EIA). Negative for *Toxoplasma* IgG may presume that abattoir workers may not have had previous exposure to *Toxoplasma gondii*. However, negative results were seen in some cases of isolated exposure with subsequent loss of detectable antibody (Jones JL *etal* 2007; Tenter Am *etal* 2000.)

Table 1

*Risk factors associated with the occurrence of disease among abattoir workers in Imus, Cavite*

Parameters	Toxoplasma Antibodies		Risk Estimates at 95% C.I		
	Negative	Positive	Odds Ratio	Negative Cohort	Positive Cohort
Animal Raiser	2 (6.14%)	1 (20%)	0.258	733	2.917
Non-Animal Raiser	31 (93.9%)	4 (80%)			
Less Experienced	9 (27.3%)	1 (20%)	1.500	1,050	900
Experienced	24 (72.7%)	4 (80%)			
Once a week	7 (21.2%)	1 (20.0%)	1.077	1,010	935
More than once a week	26 (78.8%)	4 (80.0%)			
Experience moonlighting	11 (33%)	4 (80.0%)	1.25	767	6.139
Does not experience moonlighting	22 (66.7%)	1 (20.0%)			
Wear gloves	19 (57.6%)	2 (40.0%)	2.036	1,099	340
Does not wear gloves	14 (42.4%)	3 (60.0%)			
Wear mask	10 (30.3%)	3 (60.0%)	2.80	836	1.985
Does not wear mask	23 (69.7%)	2 (40.0%)			
Wear goggles	1 (3.0%)	1 (20.0%)	1.25	563	4.500
Does not wear goggles	32 (97.0%)	4 (80.0%)			
Experience blood splash	20 (60.6%)	4 (80.0%)	3.61	897	2.339
Does not experience blood splash	13 (39.4%)	1 (20.0%)			
Experience wounds or injury	21 (63.6%)	4 (80.0%)	4.34	910	1.080
Does not experience wounds or injury	12 (36.4%)	1 (20.0%)			

The relationships that exist between a disease risk factors in this cohort study is shown in Table 1. Study revealed the presence of *T. gondii* antibodies among animal raisers at 20% (n=1) compared with non-animal raisers with 80% (n=4). The relative risk of having *Toxoplasma* infection among abattoir workers who are animal raisers was 2.917 times as more likely to have infection than those who are non-animal raisers. Hence, the odds ratio or the probability of having the infection among animal raisers was 0.258 times the odds of having infection among non-animal raisers. The fact is that raising livestock can be one of the risk factors for acquiring the infection. Primary infections shown by seropositive were scarce, since only few cases had positive antibodies and 93.9% among non-animal raisers were negative for antibodies.

Based on the results, abattoir workers with less than a year of experience were observed to have 20% (n=1) positive in antibodies compared with those of more years of experienced with 80% (n=4). The relative risk of having *Toxoplasma* for those more than one year of experience was found to be 0.700 times more likely than those with less than one year of experience. Thus, the odds ratio of having the infection for those with experience was 1.500. This may be due to activities such as physical or repeated contact with infected animals and physical hazard

in trading of live animals that may favor proliferation of oocyst transmission to humans (Abdullahi et al 2015).

Another risk factor that contributed to occurrence of infection is the time of exposure to slaughter house. Results showed that abattoir workers who report once a week had 20% (n=1) positive and 80% (n=20) for those who reported more than once a week. It can be inferred that the relative risk of having infection among who reported more than once a week was found to be 0.938 times more likely to have infection than those who did for with less than a week of exposure. The odds ratio of having the Toxoplasmosis is 1.077 times the odds of having infection among those who reported once a week. Abattoir workers could be associated with health hazards that could result in occupational diseases or may aggravate the existing ill health of non-occupational origin due to exposure to livestock.

Those who experienced moonlighting had a relative risk of 6.133 times as more likely to have infection that those who did not experience moonlighting. The odds ratio of having toxoplasmosis is 0.125 times the odds of having infection among those who did not experience moonlighting. This could be due to exposure to different slaughterhouses with noncompliance regarding appropriate personal protective equipment (PPE) as precautionary measures. However, 80% (n=4) were positive for antibodies for those who wear goggles while 20% (n=1) for those who do not wear them. Relative risk of having infection among those who do not wear gloves was 0.540 times more likely than those who wear gloves with odds ratio of 2.026 times the odds of having infection among those who wear gloves. Not wearing mask during work time showed a relative risk of 2.885 times than those who wear mask. The odds ratio of having the Toxoplasmosis was 0.290 times the odds of having infection than those who wear mask. The risk of having infection is 4.500 among those who do not wear goggles with odds ratio of 0.125 times more likely than those who wear goggles.

The risks of acquiring infection in this study were low for those who do not wear protecting gear. This can be attributed to some factors such as viable *T. gondii* in cattle was low and unsuccessful and the parasite may have been eliminated or reduced to undetectable levels or perhaps due to innate resistance (Dubey JP. 2009). Thereby, it can be possible that some cattle had already controlled infection at the moment of slaughtering and flesh contained less viable cyst.

Another parameter to consider was in the occurrence of toxoplasma to injury that may cause blood splashed among abattoir workers. In this study, 80% (n=4) positive in Toxoplasma experienced blood splash and 20% (n=1) for those who did not experienced. Similar findings were found for those who experienced injury at work. Relative

risk among who experienced blood splashed is 2.333 times more likely to have infection than who had not experienced blood splash.

The risk ratio of those having infection among who experienced blood splash was 0.385 times the odd as having infection than among those who did not experienced it. Likewise, relative risk among who experienced injury was 2.080 times more than those who never experienced having injury. Hence, odd ratio is 0.438 times more likely those who never had injury.

Physical hazards may include cuts, needlestick injuries, wounds, accidents while other predisposing factors such as contaminated water, animal contact and slippery surface may have contributed to the occurrence of infection. Findings of this study were in congruence with the previous study conducted in Asian countries such as Malaysia by Abdullahi (2016); Banjo et al 2013). Other common risk factors were mechanical injury and animal kick that may have accounted for prevalence. It was also observed in this study that most of the abattoir workers were exposed to physical and biological hazards which could be attributed to noncompliance by the workers to observe precautionary measures. This finding is congruent with Christine et al 2002). But majority of the workers wore appropriate protective clothing like rubber boots, plastic apron, gloves.

## **Conclusion**

The occupational exposures contributed to the risk factors of occurrence *Toxoplasma* infection among abattoir workers. Among the risk factors, moonlighting activities of the abattoir workers had high risk of association with the diseases occurrence. However, further investigations need to be performed to elucidate other conditions that could be associated with seropositivity and the potential role of livestock consumption in epidemiology of *Toxoplasma* among abattoir workers. The study recommends the compliance on the PPE among abattoir workers to take for reasonable precautions to protect their health and safety of and others who might be affected by their work activities.

It is also recommended that routine medical examination and diagnostic investigations on possible risk exposure to occupational health hazards be conducted biannually as they are important disease control measures among the abattoir workers. Moreover, occupational safety and health measures should be imposed among the workers, such as routine hygiene handwashing before eating, drinking, and smoking. More so, proper control measures should be taken and all existing guidelines and laws governing the abattoir operation in various abattoir operating in the country should be enforced.

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# Level of Preparedness and Strategies in Disaster Risk Management of Selected Tertiary Hospitals and Higher Educational Institution in Dasmariñas City, Cavite

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## Abstract

The Philippines is highly vulnerable to natural disasters because of its geographical location and physical environment. The natural disasters can cause loss of lives, injuries, health problem, property damage, livelihood, and services. This study utilized convergent parallel mixed method of research. The participants are employees of tertiary hospitals and higher educational institutions in Dasmariñas City, Cavite. The finding showed that majority of the participants sometimes prepared psychological trauma assistance, stockpiling food commodities, personal hygiene, and needed equipment for search and rescue management. The strategies often used are monthly meeting for continuity plan for emergency, evaluation of employees' knowledge in strategies being undertaken by the institution, monthly inventory of materials and medications needed for emergency disaster, and training support regarding survivors. Using Spearman's Rho, the result showed high significant correlation between preparedness and strategies used by the participants. In Pearson R Correlation, there was no significant correlation between the participants' profile to their preparedness and strategies used. In qualitative analysis, most of the participants were aware of the contents of emergency institutional disaster plan and their institutional disaster heads coordinated with the CDRRMO and with the barangay officials. Yearly, they complied with safety measures required by the government like fire and earthquake drills, but some training needs for basic life support and preventive measures were not implemented. In the event of disaster, participants became aware thru the use of social media and text messages.

**Keywords:** Preparedness, strategies, disaster, risk management, evacuation, stockpiling, trauma, continuity plan for emergency.

## Introduction

Disasters are sudden overwhelming and unforeseen events caused by nature or humans. The natural disasters include weather phenomena like tropical storms, extreme heat or cold, winds, floods, earthquakes, landslides and volcanic eruptions. Disasters caused by humans include transportation and industrial accidents, release of hazardous materials that cause fire and collapse of buildings. These result to major illness, death, or devastation of property (International Federation of Red Cross and Red Crescent Societies, 2016).

The Department of Education's (DepED) Republic Act 9155, specifically mandated school planning team and disaster risk reduction management team to work together to implement disaster preparedness. They do assessment, planning, implementing, evaluating, monitoring and reporting to reduce disaster risk.

In the Philippines, people refrain from obeying the government's warning to evacuate even before an impending super typhoon for fear of losing their properties. This response to disaster points to the lack of awareness of the people on the impending dangers of disasters (Ching, 2014).

The main objective of this study was to determine the level of preparedness and strategies in disaster risk management of selected tertiary hospitals and higher educational institution in Dasmarinas City, Cavite. The researcher identified the following; (1) the participants' preparedness and strategies in disaster risk management; (2) recommended strategies that would be used for safety of students/patients and employees during a disaster; (3) the barriers in preparation and strategies encountered by the participants; (4) a basis for improving the currently implemented preparation and strategies; (5) the significant relationship between the participants' preparedness and strategies in disaster risk management; (6) the significant relationship between participants' profile and their preparedness and strategies used. This study will be beneficial to the hospitals and higher educational institution employees, students, patients and nearby neighborhoods because it will inform them how to reduce the risks in a disaster when preparation and strategies are used. This study can build behavioral motivation and interpersonal relationship with each other to work together during a disaster. This study may prevent problems that would lead to serious illness affecting an individual's health.

## **Methodology**

The researcher utilized the convergent parallel mixed method of research and random sampling in gathering information. The inclusion criterion for participants was employees of tertiary hospitals and higher educational institution regardless of employment status. The utilized questionnaire tool was self - made by the researcher, which was validated and pilot tested. The result of .967 using Cronbach's Alpha showed that all terms in the questionnaire were highly valid and reliable. The questionnaire was subdivided into four parts: I-participants' profile; II-participants' level of preparedness; III-participants' strategies used; and Part IV-qualitative questionnaire pertaining to preparation and strategies used by the institution. The researcher wrote a letter addressed to the Hospital and Higher Educational Institution Administrators for approval before the actual administration of the research instrument to the employees. Likewise, informed consent from the participants was also obtained. The participants of this study were 180 employees from Higher Educational Institutions; Emilio Aguinaldo College, De La Salle University, Saint Jude College and tertiary hospitals; Emilio Aguinaldo College Medical Center Cavite, De La Salle University Medical Center, Pagamutan ng Dasmariñas. The researcher utilized frequency distribution and percentage, weighted mean, Spearman Rho Correlation, and Pearson R correlation for the analysis of data.

## **Results and Discussion**

The findings show that most of the participants were aged 20–30 years old, female, college level, employed in tertiary hospitals and higher education institutions in Dasmariñas City, Cavite. The participants' service rendered to the institution was between 6 months to 1 year and 9 years above. Their monthly income ranged from P5, 001 – P10, 000 and P20, 001 above.

Table 1

*Participants' profile (n = 180)*

	Variable	Frequency	Percentage
Age	20 - 30 years old	82	45.6
	31 - 40 years old	40	22.2
	41 - 50 years old	26	14.4
	51 - 60 years old	32	17.7
	Non – Academic	42	23.3
Occupation	Academic	46	25.6
	Hospital Personnel	52	28.9
	Health Care Provider	40	22.2
	Below P5,000	3	1.7
Income	P5,001 – P10,000	52	28.9
	P10,001 – P15,000	28	15.6
	P15,001 – P20,000	30	16.7
	P20,001 above	67	37.2
Services	6 months to 1 year	44	24.4
	1 year to 3 years	38	21.1
	3 years to 6 years	37	20.6
	6 years to 9 years	16	8.9
	9 years and above	45	25.0

Table 2 below shows that the participants are often prepared when it comes to the following: management of medical supplies for first aid; compliance to safety measures required by the government; and communication equipment. Under Republic Act 101211, a City Disaster Risk Reduction and Management Office (CDRRMO) in every province shall be responsible for setting the direction, implement programs and evaluate compliance. This law established local government's capacities on disaster risk reduction and management through decentralized powers, responsibilities and resources.

Table 2

*Level of preparedness in disaster risk management*

	Mean	Interpretation
Visible warning signs	3.87	Often prepared
Availability of materials like flashlight and whistle	3.62	Often prepared
Coordinated activities with CDRRMO and Phil. National Red Cross	3.73	Often prepared
Appropriate evacuation plan	3.81	Often prepared
Stockpiling of food commodities and individual personal hygiene use	3.46	Sometimes prepared
Communication equipment like two - way radio and cellphone	3.88	Often prepared
Management team for emergency operations	3.72	Often prepared
Complete and needed equipment for search and rescue management	3.53	Often prepared
Psychological trauma assistance	3.43	Sometimes prepared
Visible and well known community group first aider	3.61	Often prepared
Medical supplies for first aid	4.10	Often prepared
Appropriate and well known area for medical and relief assistance	3.83	Often prepared
Compliance to safety measures required by the government	3.94	Often prepared
Appropriate allocation of transportation for commodities	3.70	Often prepared
Printed documents of total number of employees with contact number of relatives in case of emergency.	3.73	Often prepared
<b>Total Weighted Mean</b>	<b>3.73</b>	<b>Often prepared</b>

The fire drills in a building allow people to hear what a fire alarm tone sounds like and learn where exits or stairs are located. The Bureau of Fire Department conducts fire drills every six months in a year. The participants however, were only sometimes prepared on psychological trauma assistance, stockpiling of food commodities, personal hygiene, and equipment for search and rescue. The participants failed to prioritize post disaster needs. The disaster assistance response team in government and non - government work together for funding the relief operations to the affected families. These families are moved to designated evacuation centers during the calamity and referred to Department of Social Welfare and Development (DSWD) office for livelihood assistance (Sales Jr., 2015).

Table 3

*Strategies in disaster risk management*

	Mean	Interpretation
Risk identification and assessment	3.79	Often used
Information management and available learning materials for information dissemination	3.72	Often used
Engagement and participation of employees in disaster risk management activities	3.88	Often used
Training support related to life saving like cleaning of wound and cardiac pulmonary resuscitation	3.78	Often used
Training support regarding survivor	3.68	Often used
Planting trees and improved waste material segregation	3.74	Often used
Delegation of tasks to employees in disaster management	4.43	Often used
Educational continuity plan for emergency disaster like fire drill and earthquake drill	3.93	Often used
Program update and incorporate health related activities like hand washing to prevent transfer of bacteria that cause diseases	3.88	Often used
Monthly inventory of materials and medication needed for emergency disaster	3.68	Often used
Coordination with other support group or outside sources like City Disaster Risk Reduction and Management Office	3.76	Often used
Attend first aid training and seminars for employees	3.77	Often used
Awareness of information dissemination on the effect of climate change to employees	3.77	Often used
Monthly meeting for continuity plan for emergency disaster	3.52	Often used
Evaluation of employees knowledge in strategies being undertaken by the institution	3.55	Often used
<b>Total Weighted Mean</b>	<b>3.79</b>	<b>Often used</b>

Based on Table 3 the strategies often used by participants were delegation of task, educational continuity plan for emergency like fire and earthquake drills, program update, engagement and participation of employees in the strategies. The participants often used were monthly meeting for continuity plan for emergency, evaluation of employees' knowledge in strategies being undertaken by the institution, monthly inventory of materials and medications needed for emergency disaster and training support regarding survivor.

The psychological preparedness before disaster can help decrease anxiety. Lack of preparation at all may result to mental health problem or trauma. The individuals can physically prepare with consistent practice of emergency plan to increase sense of being in control. Being psychologically prepared, one can think more clearly and reduce the risk of serious injury and loss of life (Australian Psychological Society, 2013).

In preparing for a disaster, stockpiling of food should be nonperishable with high protein to meet the basic physiologic needs of the body. Expiration date must be checked every 6 to 12 months to keep food fresh. Without food during disaster, the body becomes weak and unhealthy (DiMaggio, 2012).

The Department of Education Disaster Risk Reduction and Management Coordination and Information Management with the Local Government Unit Disaster Risk Reduction and Management Office (2016), based the following programs and strategies: (1) risk identification and assessment, (2) information management, (3) school and community stakeholders engagement and participation, (4) student activities, (5) staff training support, (6) education continuity plan, (7) DRRM Integration in the K to 12 Curriculum, (8) learning materials and strategies, and (9) national greening program.

Table 4

*Correlation between preparedness and strategies*

	Spearman's rho	Decision
Correlation Coefficient	.584	Accept Ha; Reject Ho
Sig. (2-tailed)	.000	
N	180	

Using Spearman's Rho at .000 level of significance with correlation of .584, the result showed a high significant correlation between preparedness and strategies used by the participants in disaster risk management. In applying strategies, community participation and commitment are important in disaster risk management for they enhance capabilities to pursue disaster preparedness.

Table 5

*Correlation between profile and their preparedness and strategies used*

	Pearson R Correlation		Decision/ Interpretation
	Correlation	0.116	
Age	Sig. (2-tailed)	0.114	Accept Ho; Reject Ha
	Correlation	0.128	
Occupation	Sig. (2-tailed)	0.242	Accept Ho; Reject Ha
	Correlation	0.15	
Income	Sig. (2-tailed)	0.176	Accept Ho; Reject Ha
	Correlation	0.103	
Service	Sig. (2-tailed)	0.101	Accept Ho; Reject Ha
	N	180	

\* Correlation is significant at the 0.05 level (2-tailed).

Using Pearson R Correlation at 0.05 level of significance with the degree of freedom 180, the results show that there was no significant correlation between the participants' profile and their preparedness and strategies used. Majority of the older people aged below 65 years old are more vulnerable in case of a natural disaster. However, awareness to the surrounding and exposure to previous natural disasters make them more familiar with them and give them ability to overcome more effectively (WHO, 2008).

Baker, et., al., (2011) stated that individuals with higher income seems to be more prepared and less vulnerable to natural disasters than low income population. The higher income have access to more resources such as television, radio, as well as cars which assist them in evacuation. Oxfam (2011), on the other hand, claimed that women are less prepared and more vulnerable to loss of life during disaster due to capabilities, rights and decision-making.

Table 6

*Preparedness by their respective institutions*

1. Most of the participants were aware of the contents of emergency institutional disaster plan but some do not know the members of the emergency operation management team.
2. Majority of the institutional disaster heads coordinate with the City Disaster Risk Reduction Management Office (CDRRMO) and with the Barangay Officials. Majority of them yearly comply with safety measures required by the government.
3. Majority of the institutions yearly undertake fire drill and earthquake drill in preparation to future events. But some training needs for basic life support and other preventive measure are not undertaken.
4. In the event of disaster, majority of the participants become aware of it thru the use of social media and text messages but the immediate decision for evacuation is not well implemented by the institutional heads.
5. A few participants know how to operate and use equipment needed for emergency disaster like fire extinguisher. But majority of the institutions do not allot budget for medical supplies, stockpiling of foods, and for search and rescue operations.

Table 7

*Barriers in preparation and strategies encountered by the participants*

1. Lack of information dissemination and coordination
2. Poor commitment and participation
3. Perceived as not priority needs in yearly contingency plan
4. Lack of budget allotted for medical supplies and materials need for search and rescue.
5. Discrimination of responsibilities and delegation of tasks.

Table 8

*Recommended preparedness and strategies that would be used for the safety of students/ patients and employees during disaster risk management*

<b>Preparedness</b>	<b>Strategies</b>
1. Community awareness and commitment in participation.	1. Assess community knowledge regarding the strategies being undertaken.
2. Strengthening capabilities and skills for life saving and survivor.	2. Continue education plan for emergency disaster like training support assistance.
3. Availability of resources for health medical supplies, food commodities, personal hygiene, and materials for emergency response search and rescue.	3. Undertake monthly inventory of materials for medical supplies, food commodities, personal hygiene, and for emergency response like search and rescue.
4. Organizing several groups of emergency team.	4. Delegate task and equal gender distribution of responsibilities.
5. Coordinating activities with outside sources.	5. Transform development of monthly contingency plan.

## Conclusions

Most of the participants were aged 20 –30 years old, employed in hospitals and higher educational institution. The participants sometimes prepared for the following; (1) psychological trauma assistance; (2) stockpiling of food commodities, personal hygiene; and (3) needed equipment for search and rescue management. The strategies

were often used were; (1) monthly meeting for continuity plan for emergency; (2) evaluation of employees' knowledge in strategies being undertaken by the institution; (3) monthly inventory of materials and medications needed for emergency disaster; and (4) training support regarding survivor. There was a high significant correlation between preparedness and strategies used by the participants in disaster risk management. There was no significant correlation between the participants' profile to their preparedness and strategies used. The barriers in preparation and strategies encountered by the participants were; (1) lack of information dissemination and coordination; (2) poor commitment and participation; (3) perceived as not priority needs in yearly contingency plan; (4) lack of budget allotted for medical supplies and materials need for search and rescue. This study showed a need for improving the currently implemented preparedness and strategies used by the institution.

## **Recommendations**

The employees should commit their participation in the emergency plan of the institutions. They should engage in seminars and trainings regarding life support and survivor. They should have an initiative to know all information regarding climate change and other environmental factors that may lead to natural and human disasters. They should follow the emergency disaster risk management plan.

The hospital administrator and higher educational institution can utilize the results of this study as bases in developing programs for continuing education of employees. They should organize several groups of risk management team for emergency disaster operations. They should disseminate the plan for risk management to all employees, students and patients regardless of status thru seminars/training. During students' and employees' orientation every semester/year the disaster risk management plan should be presented to make them aware on how to cooperate on the disaster contingency plan. During patients' admission in hospitals, they can give some pamphlets or leaflets for emergency contingency plan. The institution should allot budget for emergency disaster medical supplies, stockpiling food, materials needed for search and rescue, and organize a group for psychological assistance.

The Administrator of the City Government can utilize the results of this study as basis for improving the currently implemented preparedness and strategies used. They should provide a program to all stakeholders regarding lifesaving and survivor. They should disseminate information thru text messages and social media ahead of

time before the event if possible. During institutional inspection for emergency compliance, they should appoint a person who can decide for immediate evacuation from different institutions like typhoon and earthquake.

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