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Health Literacy and Health Promoting Behaviors Among Adults at Risk for Diabetes in a Rural Setting

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Christian Sandor Badana Ydirin, RN

HEALTH LITERACY AND HEALTH PROMOTING BEHAVIORS AMONG ADULTS AT RISK FOR DIABETES IN A RURAL BARANGAY IN CAPIZ

A Thesis Presented

to the Faculty of Management and

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In Partial Fulfillment

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By

Christian Sandor Badana Ydirin, BSN, RN

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APPROVAL SHEET

We, the members of the oral examination panel for **MR. CHRISTIAN SANDOR B. YDIRIN** unanimously approved the thesis entitled, "**Health Literacy and Health Promoting Behaviors Among Adults at Risk for Diabetes in a Rural Barangay in Capiz**." The thesis attached hereto was defended on December 17, 2019 at UPOU Diliman Learning Center for the degree of Master of Arts in Nursing is hereby accepted.

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We therefore recommend that **MR. CHRISTIAN SANDOR B. YDIRIN** be awarded the degree of **Master of Arts in Nursing** from the **Faculty of Management and Development Studies**.

Very truly yours,

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CERTIFICATE OF ACCEPTANCE OF THESIS

The thesis attached hereto, entitled **"Health Literacy and Health Promoting Behaviors Among Adults at Risk for Diabetes in a Rural Barangay in Capiz,"** prepared and submitted by **MR. CHRISTIAN SANDOR B. YDIRIN**, in partial fulfillment of the requirement for the degree **Master of Arts in Nursing** with specialization in **Adult Health Nursing** is accepted.

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Accepted as partial fulfillment of the requirements for the degree

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MASTER OF ARTS IN NURSING

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TABLE OF CONTENTS

Content Page

Approval Sheet…….. i

Certificate of Acceptance …… ii

List of Tables……vi

List of Figures……..…… vii

List of Appendices……..…….. viii

Acknowledgement…….. ix

Dedication……..…….. x

Abstract.……..…….. xi

Chapter I: Introduction……..... 01

Background of the Study……... 01

Statement of the Problem……..……... 04

Significance of the Study……... 05

Scope and Limitation of the Study……... 08

Chapter II: Theoretical Background……..... 10

Review of Literature……... 10

Synthesis……..…... 17

Theoretical Framework……..... 20

Conceptual Framework……..... 23

Operational Definition of Terms……... 24

Statement of Hypothesis……... 26

Chapter III: Methodology…… 27

Research Design……..... 27

Sampling Technique……..…….... 30

Research Setting……..……..…….... 33

Research Instrumentation……... 34

Data Collection Procedure……... 37

Plan for Data Analysis……..…….... 39

Data Management……..…….... 45

Ethical Consideration…….…... 46

Chapter IV: Results and Discussion……..……..… 47

Characteristics of the Respondents…….…… 47

Level of Health Literacy Among Adults at Risk for DM…….…... 52

Level of Health Promoting Behaviors Among Adults at Risk for DM…..…... 57

Differences Between Health Literacy of Adults at High and Low Risk……..... 63

Differences Between Health Behaviors of Adults at High & Low Risk……... 65

Relationship Between Health Literacy & Behaviors Among High Risk.....… 68

Chapter V: Summary, Conclusions and Recommendations……..…..... 73

Summary…….…... 73

Findings…….…..... 73

Conclusion……..…... 76

Recommendations……..……...…... 78

References……..…... 83

Appendices. ……..……..…... 109

LIST OF TABLES

Table 3.1. Inclusion and exclusion criteria of sample population.

Table 3.2. Statistical test, effect size and computed sample size.

Table 3.3. Proportion of total population and sample included by age and sex.

Table 3.4. Table of coding for nominal variables.

Table 3.5. Category of diabetes risk score based on simplified FINDRISC tool.

Table 3.6. Category of health literacy based on HL-SF12 tool.

Table 3.7. Category of health promoting behavior based on HPLP II tool.

Table 3.8. Range and verbal interpretation for correlational results.

Table 4.1. Distribution of participants according to sociodemographics and health characteristics.

Table 4.2. Itemized mean scores of the level of health literacy among adults at high and low risk for diabetes.

Table 4.3. Summary of the level of health literacy among adults at high and low risk for diabetes.

Table 4.4. Itemized mean scores of the level of health promoting behaviors among adults at high and low risk for diabetes.

Table 4.5. Summary of the level of health promoting behaviors of adults at high and low risk for diabetes.

Table 4.6. Differences in health literacy mean scores of adults grouped according to diabetes risk status: high risk vs. low risk.

Table 4.7. Differences in health promoting behavior among adults grouped according to diabetes risk status: high risk vs. low risk.

Table 4.8. Correlation matrix showing the relationship between health literacy and health promoting behaviors among adults at high risk for diabetes

LIST OF FIGURES

Figure 2.1. The Health Promotion Model. Source: Pender (2009).

Figure 2.2. HLS-EU Conceptual Model of Health literacy. Source: Sorensen et al (2012)

Figure 2.3. Conceptual Framework. Relationship between the study variables presented, namely: diabetes risk assessment, health literacy and health-promoting behaviors

Figure 3.1. Flowchart of selection of participants in the study.

Figure 4.1. QQ Plot of health literacy indexes of adults at high risk for DM.

Figure 4.2. QQ Plot of health behavior scores of adults at high risk for DM.

Figure 4.3. Scatterplot for health literacy and health promoting behaviors among adults at high and low risk for diabetes.

LIST OF APPENDICES

Appendix A. Ethics Review Board Form

Appendix B. Research Instrument

Appendix C. Simplified FINDRISC Questionnaire

Appendix D. Health Promoting Lifestyle Profile II Questionnaire English

Appendix E. Health Literacy Survey Short Form 12 Questionnaire English

Appendix F. Data Collection Protocols

Appendix G. Request Letter for Permission to Use an Existing Survey

Appendix H. Granted Permission to Use the Instruments

Appendix I. Individual Informed Consent

Appendix J. Barangay Captain Permission Letter

Appendix K. Barangay Health Workers Offer Letter

Appendix L. Request letter for Acquiring Data from Municipal Rural Health Unit

Appendix M. Barangay Health Workers Orientation

Appendix N. Documentation Photos

Appendix O. Curriculum Vitae

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DEDICATION

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ABSTRACT

Due to the lack of baseline data assessing the health literacy and health behaviors of adults in a remotely located upland barangay, which employs vigorous statistical sampling, that could support the existing relationship between health literacy and health promoting behaviors among adults at risk for diabetes, this study came into fruition. This descriptive correlational research design study generally aimed to determine the existing correlation between the health literacy and health promoting behaviors of adults at high risk for diabetes. A total of 400 adults in Barangay Vizcaya, President Roxas, Capiz, aged 18-59 years old, were included in the final sample after they were were randomly selected utilizing a proportionate stratified sampling technique by age and sex. Data were collected through face-to-face interview using the Health Literacy and Health Promoting Behavior Questionnaires. Both adults at high and low risk for diabetes were found out to have limited health literacy and negative health promoting behaviors, with disease prevention and physical activity as having the worst health literacy and health behavior subscale scores, respectively. A statistically and practically significant difference exists between the health literacy of adults with high and low risk for diabetes, but no significant difference exists between their health promoting behaviors. Furthermore, there is a moderately positive correlation between the health literacy and health promoting behaviors of adults at high risk for diabetes. Thus, healthcare workers need to focus on increasing the health literacy of adults, especially those who are at high risk for diabetes, to facilitate development of health promoting behaviors. An all population-based inclusion should still be implemented when conducting health information campaigns, so as to reach the greater percentage of the adults who have lower levels of health literacy.

CHAPTER I

THE RESEARCH PROBLEM

Background of the Study

Diabetes risk assessments are essential information that could be utilized in promoting health education among adults at risk for the disease. The impact of diabetes risk factors on health outcomes can be overestimated when ascertainment of the disease is based on medical diagnoses rather than on risk assessments (Feldman et al, 2017). In health promotion activities, health education is essential, wherein the role of health literacy is indispensable. However, health literacy should not be assessed as an isolated concept, but should be evaluated in combination with health behaviors (Yeh et al, 2018). At the present, there are only few studies being conducted that classify the adult population according to their diabetes risk, and most lacking or probably none, when relationships between their health literacy and health promoting behaviors are further examined. On the contrary, numerous studies have revealed association between health behaviors and health literacy in different populations. However, these studies focus only on urban population and either on adults diagnosed with diabetes or otherwise, healthy persons. Furthermore, it does not delineate differences in their health literacy and health promoting behaviors when categorized according to their risk for developing the disease.

In this research, Diabetes Mellitus Type 2 (DMT2) is the lifestyle-related disease taken into the limelight. The International Diabetes Federation (IDF, 2014) estimated that there are 3.2 million cases of DMT2 in the Philippines with a 5.9% prevalence rate in adults between ages of 20-79 years, with more than half of the

population remained to be undiagnosed. In the regional level, Western Visayas has been reported to have one out of five adults having diabetes (Pasaporte in Conserva (2014), with a similar statistics applicable to the whole nation, wherein one out of five Filipinos, either has pre-diabetes or diabetes. On a local municipal level, there is an increasing case of diabetes, every year, among adults in President Roxas, Capiz, with a prevalence rate of 1.4% (Pilar, 2018). This number shows those who were only diagnosed of diabetes, but nothing is known about those adults who are at risk for the disease, leaving the percentage as an underestimation of the true prevalence of undiagnosed diabetes in the municipality.

The municipal health situation report enumerated several reasons for the increase in diabetes cases such as unhealthy lifestyle of the community, incidental screening of few adults seeking treatment at the rural health unit, and regular services in nearby accessible barangays (Pilar, 2018). The geography of the municipality also contributes greatly on the distinctive eating lifestyles of the community (Paz-Pacheco, 2015). It is considered to be an agricultural base community because of the vast tract of lands devoted to sugarcane production in support of the raw materials needed by its sugar mill. The town is also rich in crops like coconut, corn, palay and root crops, especially in the upland barangays (Pres. Roxas, Capiz Ecological Profile, 2013). This situation has created regional lifestyles, such as food preferences, rich in sugar and starch, which are abundant in the region (Paz-Pacheco, 2015).

Several studies pointed out the benefits of diabetes risk assessment, with suggested approach including employment of a diabetes risk assessment questionnaire (Heikes et al, 2008, Patel & Macerollo 2010; Lindstrom & Tuomilehto, 2003), application of screening using a home-based approach (Pastakia et al, 2013) and targeted implementation in racial, ethnic and remotely underserved individuals to improve its advantage (Tabaei et al, 2003; Wilson et al, 2010). Two population studies concluded that people with undiagnosed diabetes considerably underestimate their probability of developing the disease (Kowall et al, 2017; Adriaanse et al, 2008). Relatively, the conduct of diabetes risk assessment is essential to include the entire population, but the economy of its practice is challenged. On a particular note, if significant differences could be determined between the health outcomes of persons with high and low risk for diabetes, practical empirical implications can be derived thereafter.

In addition to diabetes risk assessment, the health literacy and health promoting behaviors of adults in remotely located upland barangays are not assessed because of its inaccessibility to healthcare facility and large disparity between the health budget, and maintenance and operating costs (Pilar, 2018). Moreover, Filipinos were recorded to have a higher literacy rate, but this does not translate to higher health literacy. It is noted that patients come to seek medical consultation when they are very sick and that low health literacy affects important health behaviors, with lifestyle diseases such as diabetes (Leachon in Gloor, 2014).

There is a dearth of literature that presents correlations between health promoting behaviors and health literacy in marginalized groups, more lacking when

classified according to their diabetes risk. To the best of the author's knowledge, only one study (Sutherlan et al, 2013) have classified diabetes risk and investigated its association with health behaviors, with exclusion of health literacy in its variables. There is a need for additional studies with higher hierarchial sampling design that could support the importance of nurse-directed assessment of diabetes risk. Conclusive evidences that could show significant differences of health behaviors and health literacy between adults with low or high risk for developing diabetes implies that risk assessment is a practical and strategic approach before implementing health promotion activities, whether on a large scale or on a targeted population. Due to lack of baseline data assessing the health literacy and health behaviors of adults in a remotely located upland barangay, which employs vigorous statistical sampling, that could support the existing relationship between health literacy and health promoting behaviors among adults at risk for diabetes, this study came into fruition.

Statement of the Problem

Generally, this study aims to determine the relationship between health literacy and health promoting behaviors among adults at risk for diabetes in a remote and medically underserved rural upland barangay in President Roxas, Capiz.

Specifically, it aims to answer the following questions:

1. What is the level of health literacy among…
    a. adults with high risk for diabetes?
    b. adults with low risk for diabetes?

2. What is the level of health promoting behavior among…
    a. adults with high risk for diabetes?
    b. adults with low risk for diabetes?

3. Is there a significant difference between the level of health literacy of adults with high risk and low risk for diabetes?

4. Is there a significant difference between the level of health promoting behaviors of adults with high risk and low risk for diabetes?

5. Is there a significant relationship between the health literacy and health promoting behaviors of adults at high risk for diabetes?

Significance of the Study

Existing Body of Knowledge

Logical discrepancies exist between the health promoting behaviors among adults with similar characteristics, in the rural and urban settings. In the Philippines, the prevalence of diabetes among adults in the rural setting (4.3%) is lower compared to the adults living in the urban areas (6%) (NNHS, 2013). Relatively, the FNRI (2013) revealed that as the wealth index of adult Filipinos decreases, the prevalence rate of diabetes among these adults also decreases. On the contrary, several literatures pointed out the presence of unfavorable health promoting behaviors among adults with lower socio-economic status (Chilton 2006; von Goeler et al, 2003; Brady & Nies, 1999; El Mokadem, 2013). Another correlational research with purposive sampling design employed by Sutherland & colleagues (2012),

among adults with low socio-economic status, reported that the participants engaged in basically the same level of physical activity, monitoring of nutrition and taking responsibility for their health despite the level of diabetes risk. Limitations due to purposive sampling techniques, as well as the gaps and discrepancies between the national and international literatures warrant a need to conduct further study exploring the existing relationship between specific identified variables and health promoting behaviors of adults in rural settings. The gaps in this research were given additional supportive findings by this study.

Participants, Adults and Nurses

Absence of data about diabetes risk, health literacy and health promoting behavior assessment among adults in a marginalized community was the springboard of this study. This research generally aimed to assess the adults in rural low-income community settings in terms of their diabetes risk, health literacy and health-promoting behaviors; and to determine the existing relationship between health literacy and health-promoting behaviors. Guiding the adults in revising, adapting and maintaining health promoting behaviors needs a strong foundation of risk factor assessment, health literacy evaluation and health promoting behavior identification. Knowledge derived from the results of this study about adults' health promoting behaviors, health literacy and individual characteristics, which are specific to a marginalized group, will be utilized as assessments and will enable the nurse to help these adults to reduce their risk and ultimately prevent the development and progression of diabetes through effecting change in their current knowledge, motivation and competencies.

Society, Health Institutions and Private Organizations

The findings of this study will redound to the benefit of society considering that diabetes is a worldwide and national concern, of which diabetes risk assessment plays an important role in early detection of adults at risk for developing diabetes. Thus, government organizations and health institutions that apply the recommended approach derived from the results of this study will be able to utilize their material resources better to achieve optimal health outcomes among participants.

Administrators and Legislators

Administrators will be guided on what should be included in the diabetes risk assessment, and promotion of health literacy and healthy behaviors to improve the health status of adults, especially in medically underserved, and remotely located rural area. Legislators will be given compeling evidence of passing the health literacy bill proposed by late Senator Miriam Defensor Santiago in 2010, which warrants a review of its importance in ensuring that all Filipinos have basic health literacy skills to function effectively as patients and healthcare consumers.

Researchers

For the researchers, the study will help to uncover critical areas in the diabetes risk assessment, evaluation of health literacy and identification of health promoting behaviors that many researchers were not able to explore previously. Hence, assessment data will be available as a guide for the utilization of the local government unit's healthcare sector in their implementation of health promotion, and health education campaigns against diabetes.

Scope and Limitation

The study was limited to determining the differences in health literacy and health promoting behaviors between the adults with low and high risk for diabetes, as well as exploring the relationship between the health literacy and health promoting behavior of adults at high risk for diabetes. The scope of this study covered the sample of adults; aged 18-59 years old, in upland remotely located and medically underserved barangay, Barangay Vizcaya, President Roxas, Capiz, Philippines, who will participate in the study within 21 days period. The Pender's Health Promotion Model (HPM) (Pender, 1996) was utilized to guide the study. The constructs were derived from Pender's HPM to come up with the research variables. Health literacy was considered as the independent variable in this study. The dependent variable was limited to health promoting behaviors. In addition, sociodemographic variables such as age, sex, civil status, educational attainment, monthly income, employment status, type of family structure, health status, presence of health insurance, and number of doctor's visit in a year were included in data collection for a descriptive summary of the sample population. On the other hand, health characteristics, which included history of high blood sugar, history of high blood pressure, family history of diabetes and objective measurement of waist circumference, were implemented in this study to ascertain diabetes risk status of the participants. Due to the nature of the descriptive correlational design, generalizability of the results to other adults in a different setting, with diverse characteristics was also limited. Data collection method relied on self-reported data that could also be a potential source of bias.

CHAPTER II

THEORETICAL BACKGROUND

Review of Literature

Diabetes Risk Assessment

Several studies (Heikes et al, 2008 & Mochan et al, 2009 in Patel & Macerollo 2010) about stand-alone diabetes risk calculator found its sensitivity and specificity to be within the range of 78.2% to 88.2%, and 66.8% to 74.9%, respectively. Furthermore, in the same studies aforementioned, positive and negative predictive values were charted as 6.3% to 13.6% and 99.2% to 99.3%, respectively. An earlier study by Lindstrom & Tuomilehto (2003) concluded that diabetes risk score was a simple, fast, inexpensive, and reliable tool to identify individuals at high risk for Type 2 Diabetes Mellitus (DM Type 2). Within the range of diabetes risk score of 0-20, a score value of 9 had sensitivity of 78% to 81%, specificity of 77% to 76%, and positive predictive value of 5-13%, between the cohorted population in the year 1987 and 1992. The original Finnish Diabetes Risk Score (FINDRISC) classifies the risk status, relative to the total risk score, as low, slightly elevated, moderate, high and very high risk. It included the variables of age, body-mass index, waist circumference, physical activity, intake of fruits and vegetables, intake of hypertensive medications, positive high blood glucose results and family history of diabetes.

Having recommendations of customizing the diabetes screening to the population it is intended, identification of a valid diabetes risk assessment tool was necessary. Review of related literatures led to finding out that Finnish Diabetes Risk

Score (FINDRISC) questionnaire (Lindstrom 2003; Lindstrom et al, 2010) was applicable. This tool was the most frequently validated prevalent diabetes risk prediction tool (Masconi et al, 2015; Lindstrom & Tuomilehto, 2003; Saaristo et al, 2005). Several studies, in the USA (Zhang et al, 2014), Spain (Salinero-Fort, 2016), Finland (Schwarz et al, 2009), Guatemala (Castro et al, 2017), Mongolia (Dugee et al, 2015), Nigeria (Michael, 2017), Norway (Siri, 2014), Poland (Duda-Krol, 2016) and in the Philippines (Ku & Kegels, 2013) took advantage of the said tool. All studies had uniform conclusion that FINDRISC was useful in populations having similar characteristics, with consideration to the setting and resource constraints. Zhang et al (2014) found out that the diabetes risk score cut off points for men and women at 10 and 12, showed the highest sensitivity at 75% and 72%, respectively. On the other hand, Salinero-Fort et al (2016) established the general diabetes cut off point of 13, with a specificity of 65.1% and sensitivity of 63.8%.

A cross-sectional survey among adults by Fukuoka et al (2015), which included 250 adult Filipinos found out a higher perceived risk of developing diabetes, with family history of diabetes and high body mass index as predictors, compared to Caucasians, Koreans, and Latino Americans. A correlational study by Neatrour, Graves and Aloi (2014) among Filipino population in a rural, medically underserved and remote town, developed a risk assessment tool inspired by FINDRISC questionnaire; which included blood pressure, body mass index, waist circumference, family history and diabetic symptoms. The major elements of original FINDRISC tool was maintained, with some modifications applicable to the Philippine settings were carried out. The non-availability of a risk assessment questionnaire present in the Philippines, which is tailored to Filipinos, led to their innovation of a

tool that can detect those at risk for diabetes. The study found out a positive correlation between body mass index, as well as the total risk score, and blood glucose level. Another cross sectional study by Chua & Lim (2009) employed a purposive sampling among undiagnosed adults in one barangay in Manila and found out that FINDRISC have a sensitivity of 74.7%, specificity of 52.56% and 0.49 negative predictive value, all on a risk score cut off point set at ≥9.

On top of all the diabetes risk score assessment tool mentioned earlier, Ku & Kegel (2013) compared three different screening tool for undetected diabetes among adult population in the Philippines and found out that a simplified tool which excludes BMI, physical activity and intake of fruits and vegetables were of the same performance with the modified FINDRISC and original FINDRISC tool, with the simplified version gaining advantage in a resource constrained setting. Although, it could not reveal pre-diabetes status, abnormal high blood sugar can be can be highly detected in adults with scores greater than or equal to 7. Thus, the collective recommendations of the results of these studies in the Philippine setting prompted the researcher of this study to utilize the Simplified FINDRISC tool to measure the diabetes risk of the participants.

Health Literacy

Healthy literacy entails people's knowledge, motivation and competences to access, understand, appraise, and apply health information in order to make judgements and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life

course (Sorensen et al, 2012). There is no available national survey in the Philippines that tackles about health literacy.

Only in June 2018, the Philippine Statistics Authority approved the conduct of the National Health Literacy Survey in the country, making this venture as considerably new endeavor of the Department of Health in cooperation with the Philippine Council for Health Research and Development-Department of Science and Technology (PSA Press Release, 2018). Health literacy, being a new phenomenon in the Philippines, was explored among low-income Filipino older adults in studies by Briones et al (2015) and Agosto, Briones & Palatino (2018). The latter study was an exploration of the correlates of health literacy with socio-demographic variables. Briones et al (2015) found out that there were a high proportion of older adults who had problematic/inadequate health literacy in their respective study area. The study by Agosto, Briones & Palatimo (2018) revealed that educational attainment and healthcare access was associated with the adult's level of health literacy.

Other studies that investigate about health literacy targeted specific populations, such as the adult German population (Jordan, 2015), permanent adult residents in Beijing, China (Wei Sheng, 2015), Southern African American women (Ivanov et al, 2015), Korean immigrants (Choi et al, 2013), adult Latinos (Coffman et al, 2012), and adults with heart transplants (Cajita et al, 2017). Most of the studies concluded that there is low, problematic or inadequate health literacy among its studied population. There are numerous literatures that discuss the health literacy of adults who are already diagnosed with diabetes, but there are limited studies that

classified adults according to their risk for the disease and determined the difference between the health literacy of adults with low and high risk for developing diabetes, especially in the rural remote areas.

Health Promoting Behaviors

Health promotion is the attainment of positive health outcomes. It is motivated by the desire to increase well being and actualize human health potential (Pender, 2006). The way to achieved optimum health and prevent disease is to demonstrate consistent health promoting behaviors. There have been several studies regarding health promoting behaviors. In the Philippines, Beliran & Legaspi (2014) conducted a study among elderly population in an urban city and determined the levels of health promoting behaviors of their elderly population and found out its positive association with quality of life.

Other studies that explore health promoting behavior aimed at specific groups, particularly those persons diagnosed with diabetes mellitus (Chilton, Hu & Wallace, 2006; Sutherland et al, 2012; Tol et al, 2014), among university students (Shaheen et al, 2015; Wei et al, 2012) and in female population (Sorour et al, 2014) to name a few. All of these study utilized the six domains of health promoting behaviors, namely: self-actualization, health responsibility, exercise, interpersonal relationship, nutrition, and stress management. These studies have contrasting conclusions, implying that health behaviors are influenced by different socio-demographic variables such as age, sex, and monthly income, to cite a few.

Diabetes Risk and Health Promoting Behaviors

Several literatures are present correlating health promoting behaviors with diabetes risk factors of adults who are already diagnosed with diabetes. However, there are few literatures available that explain the differences between the health promoting behaviors of adults classified according to their level of risk for developing diabetes.

There is one systematic review and meta analysis study (Gillies, 2007), quantifying the effectiveness of behavioral interventions on the risk of developing diabetes, and two randomized controlled trial studies determining the effectiveness of behavior lifestyle changes on diabetes prevention (Tuomilehto, Lindstrom & Eriksson, 2001; Knowler, Barret, Fowler, 2002). However, all of these researches were conducted more than five years ago, making it not of recent origin (Coughlan, 2007).

Several older prospective observational studies have shown independent associations between adherence to individual healthy behaviors and reduction in diabetes risk (Feldman et al, 2017; Cooper et al, 2012; de Munter et al, 2007; Hu et al, 2003; Hu et al, 2001; Koppes et al, 2005, The Interact Consortium, 2012a; Willi et al, 2007). In contrast, only few recent observational studies have been conducted that explore relationships between health behaviors and diabetes risk. To cite, a population based prospective cohort study by Feldman et al (2017) supported a causal link between health behaviors and incidence of diabetes. In addition, Chen et al (2013) conducted a cross-sectional descriptive research among diabetic persons in Taiwan, and found out that those with higher health promoting behaviors had

better diabetic control. However, there were no studies from low and middle-income countries, particularly ones that employed higher hierarchial research evidence and utilized a probability sampling design (Bureeler et al, 2017).

Sutherland et al (2013) and El Mokadem (2013) are the two research studies, which classified their sample according to their level of diabetes risks and cardiovascular risks, respectively. Sutherland & colleagues (2013) conducted a descriptive correlational study with a purposive sampling design among adult Latinos at risk for diabetes and found out the effect of gender, which positively favored the female gender, on the subscales of health responsibility and stress management; and the overall health promoting behavior subscales. In contrary, their study reported that among the different levels of diabetes risk status, there were basically the same levels of physical activity, extent of monitoring nutrition and degree of taking health responsibility among the participants. On the other hand, El Mokadem (2013), implored a cross-sectional correlational study among adult Egyptian women at risk for cardiovascular disease, and reported a positive correlation between the cardiovascular risk status to the health promoting behaviors of the participants, with no positive correlation to age, marital status, education, monthly income and number of family members.

Diabetes Risk and Health Literacy

There are few studies conducted that explores the association between diabetes risk and health literacy among population already diagnosed of diabetes. To the best of the author's knowledge, there are few, or even possibly none, available studies that explored the differences between the health literacy of adults with high

and low risk for developing diabetes. One systematic review that includes those adults diagnosed with diabetes (Davey, Holden & Smith, 2015) reported a limited body of research due to lack of consensual definition of health literacy; however broadening its search to include health education, several correlations were recognized, with level of education, graded as having moderating effect between health literacy and diabetes risk.

Another study by McNaughton, Korman, Kabagambe & Wright (2015) found out that among emergency room adult patients in Guyana, low health literacy was associated with uncontrolled blood sugar. In contrary, a study by Vandenbosch et al (2018) found no association between health literacy and self-management behaviors of adults enrolled in diabetes education. Relatively, the importance of classifying respondents into their levels of health literacy is supported by Schillinger Grumbach & Piette (2002), who emphasized the inclusion of adults with low health literacy in studies to avoid worsening the effects of diabetes in this underprivileged population. Contrasting views among the results of the different studies included in this related literature, compels further investigation to improve understanding of the differences of health literacy in adults having high and low risk for developing diabetes.

Health Literacy, Health Behavior and Diabetes Risk

There are studies that revealed association between health literacy and health behavior but utilized populations with different diseases, other than diabetes. One study enrolled individuals with cardiovascular diseases (Aaby et al, 2017); and another with patients having infectious respiratory diseases (Sun et al, 2013). Furthermore, several studies found out relationships between health literacy and

health behavior among general population, which employed ethnic women in Taiwan (Tsai et al, 2014), urban college students (Hansen, 2015), older adults (Geboers, 2016), adults in Turkey (Caylan et al, 2017) and adolescents (Fleary et al, 2017).

There are also studies that revealed associations between health literacy and health behavior among different population diagnosed with diabetes, such as adults in Taiwan (Wang et al, 2016; Zung-Yeh, 2018), adult and elderly in South Korea (Kim, et al, 2018; Shin & Lee, 2018), adults in Iran (Niknami et al, 2018; Chaharda-Cherik et al, 2017), and adults in Denmark (Friis et al, 2016). In the Philippines, to the best of the author's knowledge, there is no available research that correlates health literacy with health promoting behaviors, especially when the adults are classified according to their diabetes risk.

Synthesis

There are surplus of literatures that present correlations between diabetes risk and health promoting behaviors (Sutherland et al, 2013; Feldman et al, 2017; Godino et al, 2016); as well as between diabetes risk and health literacy (Ivanov et al, 2015; Choi et al, 2013; Maren et al, 2012; McNaughton et al, 2015) among different populations, either healthy and/or unhealthy, alike. Moreover, there are also numerous studies that present correlation between health literacy and health behaviors in population who are already diagnosed with diabetes (Friis et al, 2016; Chahardah-Cherik et al, 2018; Yeh et al, 2018) and general adult population (Tuyen-Van Duong, Sorensen et al, 2017; Levin-Zamir, Baron-Epel, Cohen & Elhayany, 2016; Suka et al, 2015). However, there is a dearth of literature that presents

correlations between health promoting behaviors and health literacy in marginalized group, more lacking when classified according to their diabetes risk.

The review of related literatures presented numerous existing relationships between health literacy and health promoting behaviors in adults already diagnosed with diabetes, however no studies were conducted yet to explore the relationship between the health literacy and health behaviors, when adults are classified according to their risk for developing diabetes. Sutherland and colleagues (2013), in their cohort study, utilized a convenience sampling method, reported that there were the same levels of physical activity, extent of monitoring nutrition and degree of taking health responsibility among adults in different levels of diabetes risk. Two studies reported relationship between health literacy and health behavior among adult population already diagnosed with diabetes. A study by Friis, Vind, Simmons and Maindal (2016) found out some asssociations between some dimensions of health literacy and some aspects of health behavior in a Dannish population, while Chahardah-Cherik et al (2018) concluded that there was a significant relationship between all dimensions of health promoting behaviors and health literacy in Iran.

Based on cross-sectional studies, contrasting results between association of diabetes risk and healthy literacy exist (McNaughton et al, 2015; Vandenbosch et al, 2018). In contrary, older randomized controlled studies (Tuomilehto, Lindstrom & Eriksson, 2001; Knowler, Barret, Fowler, 2002) showed direct causality between diabetes risk and health behaviors, but recent prospective cohort studies (Feldman et al, 2017) found out that there is no single health promoting behavior that is significantly associated with the reduction of the adult's risk for developing diabetes.

Some studies concluded no association between some dimensions of health literacy and other aspects of health promoting behaviors (Friis et al, 2016). Most studies (Friis et al, 2016; Yeh et al, 2018) suggested that health literacy should be determined in combination with health promoting behaviors in order to develop health interventions.

Most of the randomized controlled trials are conducted by non-nursing professionals and focused on diabetes as a diagnosis rather than on risk factor assessments. Furthermore, the closely related correlational nursing studies included in this review of literature did not have strong conclusions based on the limitations of their sampling technique employed. Most studies were carried out in an urban setting, with participants having higher socio-economic status. The need for further research in different adult population, specifically in a rural setting and employing a random sampling technique is imperative. The burden of identifying adults at risk for diabetes in a marginalized community setting and developing effective health promoting interventions could be rooted on the absence of the data relating the level of health literacy and the measures of health promoting behaviors. This study aims to explain the relationship between health literacy and the health promoting behaviors of adults at high risk for diabetes.

Theoretical Framework

Pender's Health Promotion Model

The nursing theory on which this research was grounded is Pender's Health Promotion Model, which was developed in the 1980s and revised in 1996. It explores the numerous biological, psychological and social factors that influence a person to pursue health promotion activities. This model represents the multifaceted factors with which the person interacts as one reaches the optimum health. It contains seven variables related to health behaviors, as well as individual characteristics, that may influence a behavioral outcome. The model is shown in Figure 2.1.

According to Pender (1996) there are three determinants of the individual's engagement in healthy behaviors. These are individual characteristics and experiences, behavior specific cognitions and affect, and situational/interpersonal influences. The behavioral and personal factors constitute the individual characteristics. Personal factors include biological, psychological and socio-cultural components, which are general characteristics of the individual that influence health behavior. Some examples are age, personality structure, race, ethnicity and socio-economic status. Sociodemographic factors are part of the individual characteristics, while diabetes risk factors include prior behaviors and actual biophysical measures. All of these factors influence health-promoting behaviors directly or indirectly through behavior specific cognition. For better understanding, Pender suggested exploring a limited number of factors at one time. Thus, in this study, the relationship of health literacy with health promoting behaviors of the participants was examined. This was further operationalized and discussed in the conceptual framework.

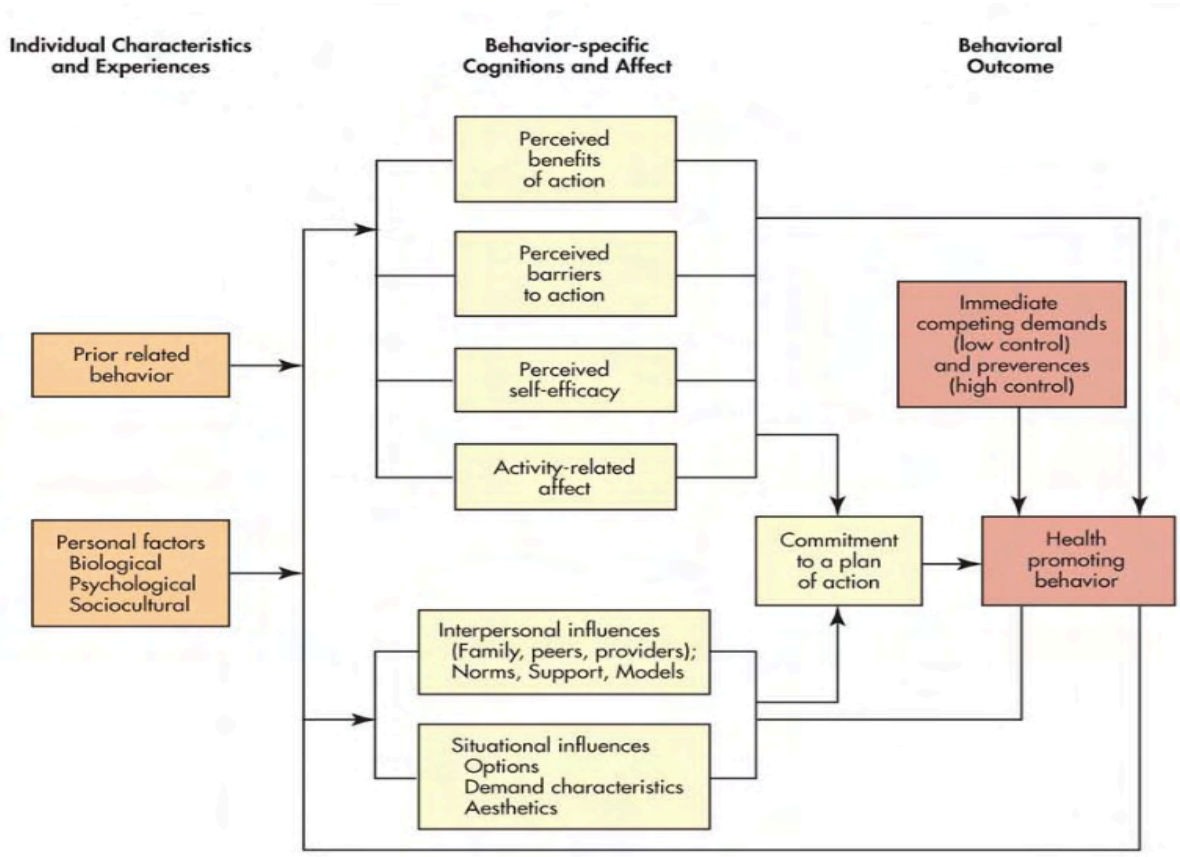


Figure 2.1. The Health Promotion Model. Source: Pender (2009).

HLS-EU Conceptual Model

Upon scrutiny of the HLS-EU Conceptual Model (Sorensen et al, 2012), some similarities are present if compared with the Health Promotion Model (Pender, 2009). To further delineate the relationship beween health literacy and health promoting behavior, the conceptual model shown in Figure 2.2, was adapted and presented in this section. While the Health Promotion Model applies to the individual level, the HLS-EU-Conceptual Model of Health Literacy circumscribes the community level. The model presents the personal, situational and societal/environmental determinants on the left; the four competences in health information and the three health dimensions, both in the center; and the health outcomes on the right. In this study, personal, situational and environmental determinants are represented by the socio-demographic variables.

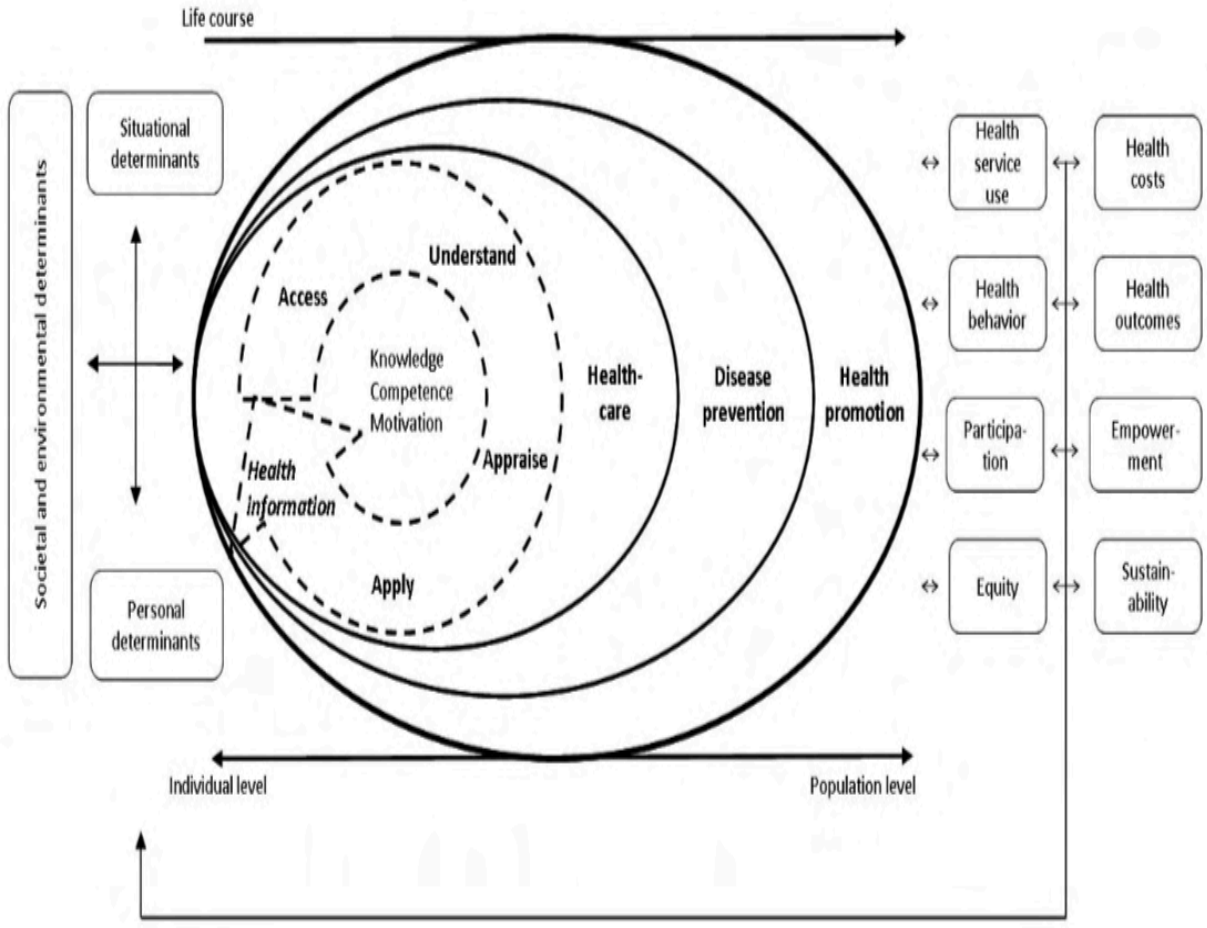


Figure 2.2. HLS-EU Conceptual Model of Health literacy. Source Sorensen et al (2012).

Furthermore, the different competencies, which is comprise of accessing, understanding, appraising and applying health information, in each specific health dimensions, namely: general healthcare, disease prevention and health promotion, are embodied in the health literacy measurement, while health promoting behavior measurement is considered as one of the health outcomes explored in this study. Notice that the arrows of the HLS-EU conceptual model have left and right directions, signifying the existing relationship that is not of direct causal nature but of association. Thus, a correlational study design approach was beneficial in this study, in accordance to this conceptual model.

Conceptual Framework

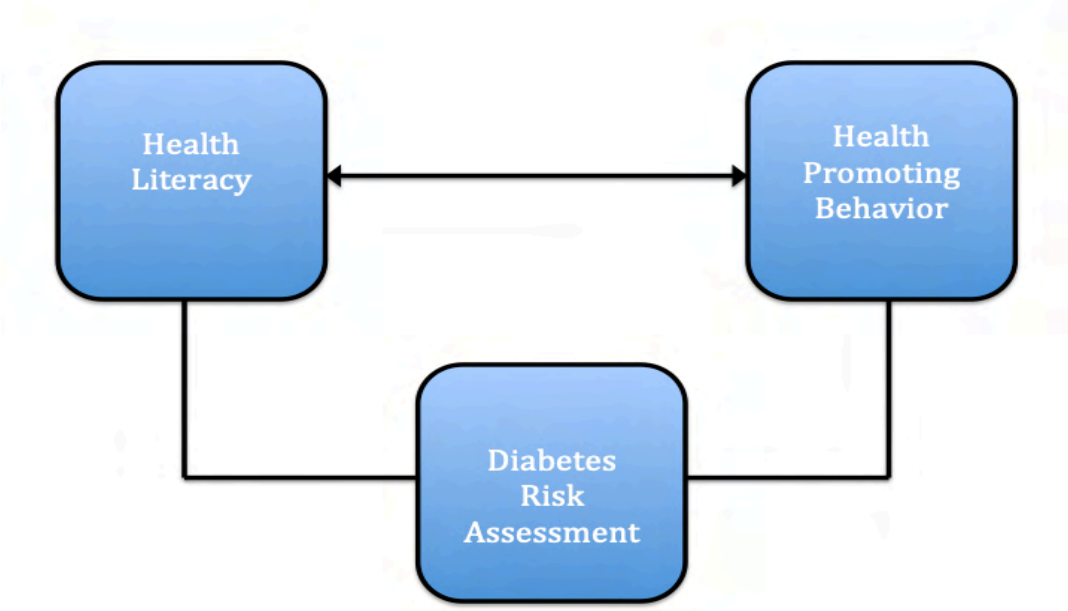


Figure 2.3. Conceptual Framework. Relationship between the study variables presented, namely: diabetes risk assessment, health literacy and health-promoting behaviors.

The revised Pender's Health Promotion Model (Pender, 2006) was utilized to guide in explaining the relationships between the presented study variables, namely: diabetes risk assessment, healthy literacy and the health promoting behaviors of adults in the study population. This theory explains the reason for the person's engagement in health behaviors and identifies the variables influencing health-promoting behaviors. This study focused on health literacy as the independent variable, and health promoting behaviors as the dependent variable. Diabetes risk assessment classified the respondents according to their level of risk for developing diabetes. Furthermore, differences between the high risk and low risk adults' health literacy and health promoting behaviors were explored. The sociodemographics were operationalized into age, sex, civil status, educational attainment, monthly income, employment status, type of family structure, health status, presence of health insurance and number of doctor's visit in the last year.

For the behavior-specific cognition and affect in the Health Promotion Model (Pender, 2009), the study focused on the adult's health literacy, which is also the central element of HLS-EU Conceptual Model (Sorensen et al, 2011). The health literacy was operationalized into the health literacy indexes computed by utilizing the HL-SF12 Tool (Duong et al, 2017), while the HPLP II Tool (Walker, Sechrist & Pender, 2006) was utilized to measure the possible health outcome, which was operationalized as the health promoting behavior scores of the participants. Both reflected the degree to which the adults actively engage in health promoting behaviors as infuenced by their health literacy.

Operational Definition of Terms

The variables of interest for this research were grounded on Pender's Health Promotion Model (Pender, 2006) and the HLS-EU Conceptual Model (Sorensen et al, 2011). The variables included were diabetes risk, health literacy and the health promoting behavior. The following terms were first conceptually defined, followed by its operational meaning.

Diabetes Risk is the risk of an individual based on the high scores obtained from a diabetes risk assessment that could predict an individual's risk of developing diabetes (Diabetes UK, 2016). In this study, diabetes risks, refers to the diabetes risk score of the participants obtained from the simplified FINDRISC Questionnaire (Ku & Kegels, 2013), categorized into low risk (< 7) and high risk (≥7) for developing diabetes type 2.

Health literacy is linked to literacy and entails people's knowledge, motivation and competences to access, understand, appraise and apply health information in order to make judgements and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course (Sorensen et al, 2012). In this study, health literacy is the independent variable, which refers to the general health literacy index obtained from the scores in different dimensions and competences of health literacy, as measured by the Health Literacy Short Form 12 in *Tagalog* version (Duong et al, 2017; Agosto & Briones, 2015); and categorized as inadequate (0-25), problematic (>25-33), sufficient (>33-42) and excellent (>42-50) health literacy.

Health promoting behavior is the outcome of the Health Promotion Model, which is the attainment of positive health outcomes (Pender, 2006). In this study, health promoting behavior is the dependent variable, which refers to the overall health promoting behavior score and individual scores among its different subscales, based on the self-reported health promoting behaviors of the participant as measured by Health-Promoting Lifestyle Profile (HPLP II) instrument in *Hiligaynon* version (Walker, Sechrist, & Pender, 1995; Beliran & Legaspi, 2014); and categorized as a desirable/positive health promoting behavior (mean ≥2.5) or undesirable/negative health behavior (mean <2.5).

Statement of Hypotheses

H_0: There is no significant difference between the level of health literacy of adults with high and low risk for diabetes.

H_1: There is a significant difference between the level of health literacy of adults with high and low risk for diabetes.

H_0: There is no significant difference between the level of health promoting behaviors of adults with high and low risk for diabetes.

H_1: There is a significant difference between the level of health promoting behaviors of adults with high and low risk for diabetes.

H_0: There is no significant correlation between the health literacy and health promoting behaviors of adults with high risk for diabetes.

H_1: There is a significant correlation between the health literacy and health promoting behavior of adults with high risk for diabetes.

Chapter III

Research Methodology

Research Design

A descriptive correlational research design, with a cross-sectional approach, was utilized in this study. According to Burns and Grove (2011), descriptive study is designed to gain more information about sample characteristics within a particular field of study. The correlational study design attempts to understand the relationships among phenomena as they naturally occur, without any intervention (Polit & Beck, 2014), such as the relationship between health literacy and the health promoting behaviors of adults at risk for diabetes in a rural setting. These are variables that could not be technically be manipulated since it is unethical. Thus, a correlational study was appropriate to explain the variation in health literacy in relation to the variation in health promoting behavior scores of the participants in this study. It was hypothesized that there will be a correlation between the health literacy and health-promoting behavior scores of the participants at high risk for diabetes. Limitations on the interpretative value of correlation results were present, but with the utilization of Pender's Health Promotion Model as the theoretical basis, results of this study maybe proven to be conclusive.

Research Variables

The main dependent variable was the health promoting behaviors, while the independent variable was health literacy. Furthermore, the sociodemographic characteristics such as age bracket, sex, civil status, educational attainment, monthly income, employment status, type of family structure, presence of diagnosed medical

condition, and presence of health insurance were included as part of the descriptive analysis of the sample population. The health promoting behaviors and health literacy was operationalized into health promoting behavior scores and health literacy indexes, obtained from Health Promoting Lifestyle Profile (HPLP II) Tool (Walker, Sechrist & Pender, 1995) and Health Literacy- Short Form 12 (HL-SF12) Tool (Duong et al, 2017), respectively.

Validity Issues

There are several validity issues in the conduct of a correlational design. There are four considerations in evaluating the validity of a correlational research design, namely: statistical conclusion validity, internal validity, construct validity and external validity (Cook & Campbell, 1979 in Polit & Beck, 2014). These four considerations were taken into account in the following:

First, statistical conclusion validity was intensified through employment of blocking by including possible confounding extraneous variables such as age, sex, civil status, educational attainment, monthly income, employment status, type of family structure, presence of diagnosed medical condition, and presence of health insurance. Also, statistical control over the variables of age and sex was employed through implementation of a proportionate stratified sampling technique, based on the barangay population profile 2018-2019 (Cabales, Fernando & Obal, 2019), removing the effect of major intervening variables, such as age and sex on the dependent variable (Polit & Beck, 2014).

Second, internal validity was enhanced through constancy in communication and uniform conduct of research protocols through standardization of procedures, formally structured data collection protocol orientation, adequate skills training of 10 carefully selected Barangay Health Workers (BHWs), and vigilant on site monitoring to ensure proper implementation of data collection procedures. Effects of selection bias were remedied through random selection of participants from an accessible population, while instrumentation bias was minimized through the conduct of reliability testing of the translated questionnaires.

Reliability testing of the instrument was carried out utilizing Guttman's Lambda-2 reliability coefficients during pilot testing. Internal consistency testing with Guttman's Lambda-2 reliability coefficient of <0.7 was the decisional value (George & Mallery, 2003; Guttman, 1945) for rejection of reliability. Contamination bias was prevented through home-based screening approach, wherein each participant was not inadvertently exposed to influence of other participants. Home visits would ensure concealment of responses of each participant (Krishna et al, 2010).

Third, construct validity was improved through utilization of Pender's Health Promotion Model & HLS-EU Health Literacy Model as a guide in the operationalization of theoretical concepts into research variables. Lastly, external validity was strengthened through inclusion of a larger sample population based on a computed sample size utilizing the G* power calculator (G* Power, n.d.) with a priori analysis set at 80% power, 0.05% alpha level of significance, and a set effect size of at least 0.5 (Cohen, 1969) to determine correlations among variables.

Sample and Sampling Technique

Inclusion and Exclusion Criteria

The selection was based on the inclusion and exclusion criteria. Inclusion criteria encompassed those who were never diagnosed of diabetes of all types, not taking insulin or oral medications for blood glucose control, able to hear and understand a common language (*Hiligaynon*, English or *Tagalog*), and all adults aged 18-59 years old with signed written informed consent. Exclusion criteria included those who were pregnant, lactating, with illness having a likely prognosis of less than 1 year, psychiatric illness, those who were less than 18 years old and refused to participate. As the study is focused on adults, aged 18-59 years old, it was feasible to use a probability sampling technique. Table 3.1 below shows the inclusion and exclusion criteria for the study.

Table 3.1. Inclusion and exclusion criteria.

Inclusion Criteria	**Exclusion Criteria**
18-59 years old;	Pregnant;
Never been diagnosed of DM;	Lactating;
Not takeing insulin or OHA;	Psychiatric Illness;
Able to understand Hiligaynon;	Illness with prognosis of less than 1 year;
Willing to participate in the study.	Refusal to participate.

Sampling Design

From the accessible population (Cabales, Fernando & Obal, 2019), a stratified random sampling was employed to systematically select the sample population according to age and sex. Using the list of adults, aged 18-59 years old, obtained from the barangay, with details including their sex and age, proportionate stratified random sampling was employed to ensure representativeness of both age and sex.

The random function in *Microsoft Excel* © was utilized to assign random serial number, sort out the strata and randomly select participants.

Sample size was initially determined using the G* power calculator for sample size (G* Power, n.d.), with a priori power analysis for Pearson's r correlation for two independent samples; calculated based on the power of 80%, 0.05 alpha level of significance and different effect sizes of 0.1, 0.3 and 0.5, respectively (Cohen, 1969). The highest required sample size was 433 for an effect size of 0.1. However, the researcher deliberately alloted a total of 500 randomly selected participants to increase the possibility of return rate. Table 3.2 shows the minimum sample sizes required, computed based on the three different effect size.

Table 3.2. Statistical test, effect size and computed sample size.

Statistical Test	Effect Size	Sample Size
Correlation between health literacy indexes & health promoting behavior scores Pearsons r' correlation	0.1 (Small)	433
	0.3 (Medium)	109
	0.5 (Large)	47

The total population of adults aged 18-59 years old in Brgy. Vizcaya, President, Roxas, Capiz (Cabales, Fernando & Obal, 2019) was 1,239. However after using the inclusion and exclusion criteria, minus the unreturned questionnaires and tool with missing data, a total of 400 eligible participants were included in the final sample of the research. Figure 3.1 shows the flowchart of the selection of participants.

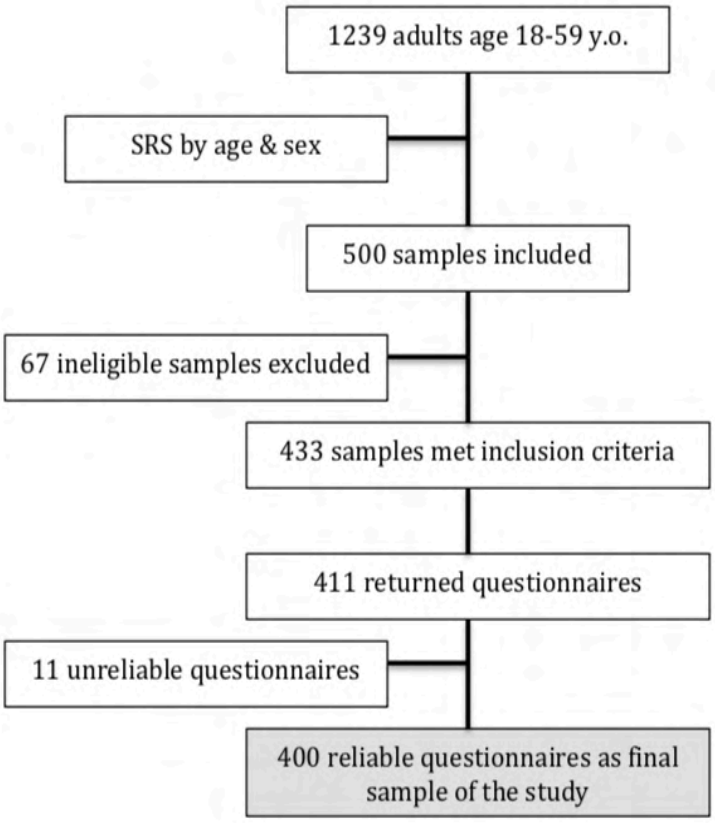


Figure 3.1. Flowchart of selection of participants in the study.

A response rate of 80% was computed, accounting for the 400 samples included in the final data analysis, out of the 500 randomly selected samples, from the total population of 1,239 adults, aged 18-59 years old. This response rate is acceptable in comparison to the average level of response rate of 52.7% based on a meta-analysis review of 1,607 survey studies (Baruch & Holtom, 2008). A high response rate of greater than or equal to 80% from a small, random sample is preferable to a low response rate from a large sample (Lindemann, 2019). Furthermore, to present the demographic representativeness of the population according to demographic factors such as age and sex, Table 3.3 is presented. It shows the proportion of total population and sample size included in the study according to age and sex.

Table 3.3. Proportion of total population and sample included in the study by age and sex.

Age	Male				Female			
	Population	%	Sample	%	Population	%	Sample	%
18-44	495	40%	153	38.3%	422	34%	136	34.0%
45-54	122	10%	43	10.7%	110	9%	38	9.5%
55-59	48	4%	17	4.2%	42	3%	13	3.3%
Total	665	54%	213	53.2%	574	46%	187	46.8%

Research Setting

A sample from an accessible population of a barangay in President Roxas, Capiz, with low-income, remotely located and medically underserved adults, was selected. President Roxas is a fourth class municipality in the province of Capiz, Philippines with a population of 29, 676 (LWUA, 2015) and an average of 29.8 M pesos of annual income only (PSA, 2016). Furthermore, Barangay Vizcaya, with a population of 2,464 and average household size of 5.37, was selected as the accessible population in this municipality (LWUA, 2015). Being one of the most populous rural barangay in comparison to the other 22 barangays of the municipality, this barangay was selected to expect a higher return rate of survey questionnaires. Barangay Vizcaya is considered to be an upland barangay (Tourism Situation Report, President Roxas, Capiz, n.d.), which is considered to be medically underserved due to its remote location. Prior to the conduct of the study, there was no available data regarding the prevalence rate of undiagnosed diabetes at the municipal level. However, based on the 7th International Diabetes Federation (IDF, 2015) statistics, within the age group of 20-79 years old, the prevalence rate of undiagnosed diabetes in the Philippines is 52.5%.

Research Instrument

Pilot and Pre-testing of Tools

The simplified FINDRISC Questionnaire, Health Literacy Short Form 12 and Health Promoting Lifestyle Profile II Instrument were all originally written in the English language. Since simplified FINDRISC Questionnaire was only used as a guide for the researcher to conduct diabetes risk assessment, there was no need for its translation. On the other hand, the Health Literacy Survey-Asian Questionnaire in *Tagalog* Version (Briones et al, 2015) and the Health Promoting Lifestyle Profile II (HPLP II) in *Hiligaynon* version (Beliran & Legaspi, 2014) were utilized in this study after being granted permission of its use.

Although the English versions of these instruments were in the public domain and with generic permission to use in non-commercial purposes, nevertheless permission to use the original HPLP II English version from Dr. Susan Noble Walker and the original Health Literacy Survey-Europe from Dr. Kristine Sorensen were obtained for the plans of future publication. Since the research conducted by Beliran & Legaspi (2014), and Briones et al (2015) were conducted among different populations, pilot testing among 20 conveniently selected adults in Barangay Vizcaya, President, Roxas, Capiz, was carried out. These participants were not included in the final sample population. Guttman Labda 2 test, instead of Cronbach's alpha test, was utilized to determine reliability of the tools used. Both health literacy and health promoting behavior questionnaires had more than one concept, thus multiple traits underlie the items on each scale. Consequently, this will make Cronbach's alpha violate some assumptions and underestimate the reliability of the test (Cortina, 1993; and Green, 2005 in Tavakol & Dennick, 2011). In this study, the

reliability testing for health literacy questionnaire and health promoting behavior questionnaire resulted to a Guttman Lambda 2 reliability coefficients of 0.745 and 0.851, respectively. These were both considered acceptable (Guttman, 1945) for this study.

Sociodemographic Questionnaire

A researcher made questionnaire to determine the sociodemographic characteristics was constructed. Individual characteristics such as age bracket, sex, civil status, educational attainment, monthly income, employment status, type of family structure, health status, presence of health insurance and number of doctor's visits in the last year, were obtained using the researcher made questionnaire for sociodemographics.

Diabetes Risk Status Questionnaire

Permission to use the original Finnish Diabetes Risk Score (FINDRISC) Questionnaire (Lindstrom & Tuomilehto, 2003) was obtained from the author. However, this study was employed among Filipino adults. Thus, modifications to the FINDRISC Questionnaire were carried out after written consultation with Dr. Marie Grace Ku to adapt cut off values for waist circumference, based on the WHO South Asian standards. The cut off values were presented in the data collection protocols. The simplified FINDRISC questionnaire was utilized in this study (Ku & Kegel, 2013).

In the study by Ku & Kegel (2013), the item on the intake of hypertensive medications were found to be tricky since most Filipinos do not take medication for their hypertension. Thus, it was modified to a question that asked about a diagnosis

or being advised by a healthcare provider of having a hypertension. Although, the Simplified Finnish Diabetes Risk Score (Ku & Kegel, 2013) which excluded BMI, physical activity and intake of fruits and vegetables had only a 0.2% advantage of net diabetes yield compared to the Modified Finnish Diabetes Risk Score (which includes BMI), a decision to utilize the simplified tool was based on the needs for less expertise and equipment in a resource-constrained setting, without compromising its performance. In this study, the only objective measurement of waist circumference was implemented as suggested by the results of Dr. Ku.

Health Promoting Behavior Questionnaire

The Health Promoting Lifestyle Profile II (HPLP II) is a 52-item, four point, Likert styled instrument consisting of the following subscales: spiritual growth (SG), interpersonal relations (IR), nutrition (N), physical activity (PA), health responsibility (HR), and stress management (SM). The HPLP II measured the health promoting behaviors scores of the participants. The 4-point response scale consists of 1 representing “never”, 2 representing “sometimes’, 3 representing “often” and 4 representing “routinely” was used to determine the frequency of each behavior (Walker, Sechrist & Pender, 1995). The HPLP II English version (Walker, Sechrist & Pender, 1995) have been reported to have established content validity, construct validity, criterion-related validity and alpha coefficient of internal consistency of 0.943 and alpha coefficients ranging from 0.793 to 0.872 for all subscales (Walker & Hill-Polerecky, 1996). On the other hand, the HPLP II Hiligaynon version (Beliran & Legaspi, 2014), reported face validity and claimed internal consistency of their translated questionnaire.

Health Literacy Questionnaire

The risk of information bias could be high if the original Health Literacy Survey-Europe Questionnaire (Sorensen et al, 2012; HLS-EU-Q47 Consortium, 2011), consisting of 47 items, will be utilized because it is too lengthy, that may cause some respondents to feel that certain questions were redundant. On the other hand, a research by Van Duong et al (2017) advanced the use of a new comprehensive short-form health literacy survey tool (HL-SF12), which was originally derived from the original HLS-EU-Q47 and is consisted of 12 items only. The tool was validated among a group of Asian population. The HL-SF12 English version demonstrated high alpha coefficient reliability of 0.85, good criterion-related validity, and high level of item-scale convergent validity (Duong et al, 2019). On the other hand the HLS-EU-Q47 Tagalog Version (Briones, 2017), reported general health literacy Cronbach's alpha coefficient of 0.91 and subscale Cronbach's alpha coefficients ranging from 0.80 to 0.85.

Data Collection Method

Sociodemographics

After completion of duly signed written informed consent, a verbatim face-to-face interview was initiated, since a greater number of participants in the barangay were unable to read and write. Consistency in data collection was ensured through carrying out uniform protocols, which include step-by-step details for the physical measurement of waist circumference. The researcher made sociodemographic questionnaire included information on participants' age bracket, sex, civil status, educational attainment, monthly income, employment status, type of family structure,

health status, presence of health insurance, and number of doctor's visits in the last year.

Diabetes Risk Score

A tape measure (*ELENXS 1.5M*) was needed to complete the diabetes risk score assessment. The item was acquired in good condition and submitted for calibration per manufacturer's recommendations. Using tape measure, the waist circumference was measured in centimeters and rounded off to the nearest whole number. Prior to screening, informed consent was confirmed and explanations were reinforced in the language understood by each participant. Each participant was assigned with a serial number to ensure anonymity. The identifying number was double checked with the name on the master lists, while the serial number will be written on the consent form and on every page of the research instruments. Once consent was granted, the participant answered additional questions such as family history of diabetes, history of high blood sugar and history of high blood pressure. After the responses were recorded on the simplified FINDRISC Questionnaire, the waist circumference (cm) of each participant was measured using tape measure.

Health Promoting Behavior Score

For those participants who are able to read and understand *Hiligaynon,* the HPLP II *Hiligaynon* version (Beliran & Legaspi, 2014) was administered. However, for those who are not able to read, an item by item, word by word reading of the instrument by the researcher was employed, and choices for the answers such as "never", "sometimes", "often, and "routinely" after each item of the questionnaire

were repeatedly provided, using a cue card as a memory aide for the participants. All the responses were recorded thereafter.

Health Literacy Index

For those participants who are able to read and understand *Tagalog,* the HL-SF12 *Tagalog* version (Briones et al, 2015; van Duong et al, 2017) was administered. However, for those who are not able to read, an item-by-item, word-by-word reading of the instrument by the researcher was employed, and choices for the answers such as “very easy”, “easy”, “difficult”, and “very difficult” after each item of the questionnaire were repeatedly provided, using a cue card as a memory aide for the participants. All the responses were recorded thereafter.

Plan for Data Analysis and Interpretation

Sociodemographic Profile

To describe socio-demographic characteristics of the sample, frequency, percentage, mean, and standard deviations were used as the descriptive statistics. Health literacy index and health promoting behavior score were taken as interval or ratio measurements, excluding age bracket, sex, civil status, educational attainment, monthly income, employment status, type of family structure, health status, presence of health insurance and number of doctor’s visits in the last year, which were all considered as nominal variables in this study. To summarize numerical data of all variables, mean and standard deviations were calculated to determine normal distribution. All categorical data of the background variables will be grouped according to the list in Table 3.4 and were coded as indicated.

Table 3.4. Table of coding for nominal variables.

	Nominal Variable	Coding
Age	18-35 (Young Adults)	1
	36-55 (Middle Aged)	2
	56 and older (Older Adults)	3
Sex	Male	1
	Female	2
Civil status	Married/Common Law Relationship	1
	Single	2
	Widowed	3
	Separated	4
Educational attainment	No education	1
	Elementary level	2
	High school level	3
	Vocational level	4
	College level	5
Work status	Employed	1
	Unemployed	2
Type of family structure	Nuclear	1
	Extended	2
	Dyad	3
	Single person family	4
Health status	With diagnosed medical condition	1
	Without diagnosed medical condition	2
Health insurance	With	1
	Without	2
Monthly income	Lowest income (≤5,000 Php)	1
	Lower income (>5,000 Php but <10,000 Php)	2
	Low income (≥10,000 Php)	3
Doctor visits in the last year	Never	1
	1-3 times	2
	4-6 times	3
	7 or more times	4

Diabetes Risk Status

In this study, simplified FINDRISC assessment tool was utilized and risk classification from the Ku & Kegel (2013) recommendations was followed. A cut off Diabetes Risk Score (DRS) greater than or equal to seven (≥7), was the decisional score for the participants to be considered at high risk for diabetes, which is in line with previous studies (Chua & Lim, 2009; Ku & Kegels 2013). The higher the score, the higher is the risk to develop diabetes. Table 3.5 shows the diabetes risk classification below.

Table 3.5. Category of diabetes risk score based on simplified FINDRISC tool.

Risk Score	**Classification**
<7	Low risk for developing DM2
≥7	High risk for developing DM2

Level of Health Literacy

The general indices for Health Literacy Short Form 12 (HL-SF12) health literacy tool were standardized to unified metrics from 0 to 50 using the formula index=(M-1) x (50/3); where index was the specific index calculated, M was the mean of all participating items for each individual, 1 was the minimal possible value of the mean (leading to a minimum value of the index of 0), 3 was the range of the mean, and 50 was the chosen maximum value of the new metric. Thus, an index value obtained could range from 0 representing the lowest health literacy index and 50 as the highest (HLS-EU Consortium, 2012).

The overall health literacy (HL) score were obtained by calculating the total metric scores of the individual's responses to all 12 items. On the other hand, individual health literacy sub-scores for the three different health dimensions, namely: Health Care (HC), Disease Prevention (DP) and Health Promotion (HP), were obtained similarly by calculating the metrics of responses to each subscale items. The four levels of health literacy with its corresponding classification are shown in the Table 3.6.

Table 3.6. Category of health literacy based on HL-SF12 tool.

Index	Classification/Categories of Health Literacy
0-25	Inadequate
>25-33	Problematic
>33-42	Sufficient
>42-50	Excellent

Level of Health Promoting Behaviors

Scoring instructions from HPLP II Manual (Walker, Sechrist, & Pender, 2005) was followed. A score for the overall health promoting behaviors (HPB) is obtained by calculating a mean of the individual's responses to all 52 items. Also, six subscale scores are obtained similarly by calculating mean of responses to each subscale items, namely: Health Responsibility (HR), Physical Activity (PA), Nutrition (N), SG (Spiritual Growth), Interpersonal Relationship (IR) and Stress Management (SM).

The author of this scale (Walker, Sechrist, & Pender, 2005) recommended the use of means rather than sums of scale items to retain the 1 to 4 metric of item

responses and to allow meaningful comparison of scores across subscales. The items included on each scale are as follows: HPB (1to 52), HR (3, 9, 15, 21, 27, 33, 39, 45, 51), PA (4, 10, 16, 22, 28, 34, 40, 46), N (2, 8, 14, 20, 26, 32, 38, 44, 50), SG (6, 12, 18, 24, 30, 36, 42, 48, 52), IR (1, 7, 13, 19, 25, 31, 37, 43, 49) and SM (5, 11,17, 23, 29, 35, 41, 47). A mean of ≥ 2.50 was considered to be a positive response, in line with previous studies (Wei, 2011; Beliran & Legaspi, 2014; Sutherland, 2013). The higher the score, the higher was the health promoting behavior. Table 3.7 shows the mean scores of health promoting behaviors and its corresponding classification.

Table 3.7. Category of health promoting behavior based on HPLP II tool.

Mean Score	**Classification/Categories of Health Promoting Behavior**
≥2.5	Desirable/Positive Health Promoting Behavior
<2.5	Undesirable/Negative Health Behavior

Significant differences between health literacy and health promoting behaviors of adults with low and high diabetes risk scores

Two-tailed independent t test was used to determine the significant difference between the health literacy indexes and health promoting behavior scores of adults with low and high risk diabetes risk scores. In the most possible scenario, parametric test were utilized for data analysis in this study, since parametric testing is robust to give the right answer even when statistical assumptions are violated (Norman, 2010). The assumption of normality in a large sample size can be valid (Ghasemi & Zahediasi, 2012).

From a population of 1239, a random sample size of 400 respondents is considered to be a large enough sample size (>30 or 40), the violation of the normality assumption shoud not cause major problems (Pallant, 2007). This premise implied that in this study, parametric procedures can be utilized even the data are not normally distributed (Elliot & Woodward, 2007). Furthermore, if there are hundreds of observations available, the distribution of the data can be ignored. Based on the central limit theorem, if the sample data are approximately normal, then the sampling distribution too will be normal. In large data samples, the sampling distribution tends to be normal; regardless of the shape of the data (Field, 2009), and that the means of random samples from any distribution will have a normal distribution (Altman & Bland, 1999).

Relationship between health literacy and health promoting behaviors at high risk for diabetes

Pearson's r correlation coefficient was utilized to examine the relationship between health literacy, and health promoting behavior scores of adults with high risk for diabetes. Table 3.8 shows the range and verbal interpretation of the correlation coefficients used by the researcher to analyze the results.

The discussion about the justification of utilizing a parametric tests presented above led the researcher to adapt independent t-test for testing significant differences between the level of health literacy and the level of health promoting behaviors among adults, when they grouped according to their diabetes risk status, as well as implement Pearson's r correlation to test the correlation between health literacy and health promoting behaviors of adults at high risk for diabetes.

Nevertheless, other assumptions of parametric test such as determination of the equality of variance, appropriateness of scale of measurement and approximation of normal distribution were all met.

Table 3.8. Range and verbal interpretation for correlational results.

Range	Verbal Interpretation
Exactly -1	A perfect, negative linear correlation
-0.70 to -0.99	A strong, negative correlation
-0.50 to -0.69	A moderate, negative correlation
-0.30 to -0.49	A weak, negative correlation
-0.01 to -0.29	A very weak, negative correlation
0	No linear correlation
+0.01 to +0.29	A very weak, positive correlation
+0.30 to +0.49	A weak, positive correlation
+0.50 to +0.69	A moderate, positive correlation
+0.70 to +0.99	A strong, positive correlation
Exactly +1	A perfect, positive linear correlation

Data Management

All raw data were encoded in Microsoft Excel© and were submitted for specific appropriate IBM© SPSS© 2019 statistical testing. A certified statistician was involved in the study to perform data processing. All survey questionnaires, including each participant's informed consent will be kept for five years and will be shredded thereafter. Furthermore, all encoded data in softwares will be deleted repeatedly. All appropriate statistical testing were employed to answer each research objective advanced. IBM© SPSS© 2019 software were used for data management and analysis.

Ethical Considerations

Although correlational design is not the gold standard to examine the cause and effect of variables, it was appropriate to provide answers to research questions in this study, examining the relationship between independent and dependent variables. In the community-based setting, it is seemingly unethical to leave out individuals who wished to participate and be included for epidemiological studies. This research was ethical, as it exposed participants to higher weight of benefits than risk (Al-Riyami, 2008), with evidences advanced in review of related literatures. The adults included in the selection and assignment, had an equal opportunity to be included in the sample, sufficing justice. Furthermore, use of coded serial numbers in data collection, and provision of security password lock on the database to be kept, as well as the home-based screening approach, served the ethics of confidentiality and anonymity. As this study included only adults that meet the inclusion and exclusion criteria, the participants were not considered as vulnerable subjects. The procurement of written informed consent and official permit from the barangay ensured individual and collective autonomy. Furthermore, research ethics committee approval from UP Open University was accomplished through application of ethical review before the conduct of the study. Most of all, the study was carried out in accordance with the Declaration of Helsinki on Ethical Principles for Medical research involving Human Subjects (World Medical Association of Helsinki, 2008) and code of ethics for nurses (Code of Ethics for RN BON, 2004).

CHAPTER IV

RESULTS AND DISCUSSION

Characteristics of the Respondents

In general, the participant's ages ranged from 18 to 59 years (M=36.19, SD=11.58) and were predominantly males (53.3%); young adults with age bracket of 18 to 44 years old (71.3%), married or in a common law relationship (70.8%), had at least a highschool level of education (47.3%), and in a nuclear type of family structure (62.7%). All of these basic sociodemographic factors were proportional to the latest barangay population profile (Cabales, Fernando, & Obal, 2019). Thus, the sample population is reflective of the total population.

Almost three quarters (71.8%) claimed to have health insurance, with almost all of the population (92.8%) reported to have no medical condition. This may owe explanation to a just above half (57.0%) of the population seeking doctor's consultation for 1 to 3 times in the last year. Relatively, lack of access to healthcare resources has established a causal relationship with low health literacy (Kirsch, Jungeblut, Jenkins & Kolstad, 1993). Furthermore, it is potential that having regular medical doctor visits also increases health literacy, since adults were found to depend primarily on their healthcare provider to obtain health information (Gutierrez, Kindratt, Pagels, Foster & Gimpel, 2014).

Only half of the participants (50.2%) reported to have been employed and majority of them have the lowest bracket of family income amount of ≤5,000 Php per month (84.3%). This has an implication on the availability of financial resources,

which the adults can utilize for their health promotion and maintenance and illness prevention. This is consistent with the characteristic of adults in the rural setting, wherein the smallest percentage of the population has only the better monthly income (1.8%) of ≥ 10,000 Php. This meant that those adults with higher socioeconomic status have been greatly associated with a higher level of health promoting behavior (Chilton 2006; von Goeler et al, 2003; Brady & Nies, 1999; El Mokadem, 2013). Furthermore, self-employed adults or those who have professional or technical jobs (Nakayama et al, 2015) are more likely to have higher health literacy levels compared to unemployed individuals (Ministry of Health, 2010).

Around 1 out 3 of adults had only elementary level of education (33.0%), but with no other respondents claimed to have no education at all. This is important to note, since the association between the low level of education and poor health status was found to be mediated by health literacy (Van der Heide, 2013). A study by Howard, Sentell & Gazmararian (2006) found out that inadequate health literacy is higher among those with no highschool degree as compared to those who have. Likewise, those with low level of education had the worst level of health literacy among 8 European countries (Fullam, 2012), wherein limited health literacy is usual among those who have low level of education (Javadzade, et al, 2012). As to the family structure, about 1 out of 3 adults were living with their extended family (32.0%). This reflects the Filipino culture, wherein some members of the family, especially the parents and the older adults are taken care of by their relatives and younger family members. This is also congruent with the average household size of the barangay of 5.37 (President Roxas Ecological Profile, 2013).

Table 4.1. Distribution of participants according to sociodemographics and health characteristics.

Category	Frequency	Percentage
Entire group	400	100
Age bracket		
□ 18-44 (young adult)	289	72.3
□ 45-54 (middle aged)	81	20.2
□ 55-59 (older adult)	30	7.5
Sex		
□ Male	213	53.2
□ Female	188	46.8
Civil status		
□ Married/Common Law	283	70.8
□ Single	88	22.0
□ Widowed	21	5.3
□ Separated	8	2.0
Educational level		
□ Elementary level	132	33.0
□ Highschool level	189	47.2
□ Vocational level	8	2.0
□ College level	71	17.8
Work status		
□ Employed	201	50.2
□ Unemployed	199	49.8
Family structure		
□ Nuclear	251	62.7
□ Extended	128	32.0
□ Dyad	8	2.0
□ Single person	13	3.3
Monthly income		
□ ≤ 5,000 (lowest)	337	84.2
□ 5,001-9,999 (lower)	56	14.0
□ ≥ 10,000 (low)	7	1.8
No. of doctor visits in the last year		
□ Never	158	39.5
□ 1-3 times	228	57.0
□ 4-6 times	10	2.5
□ 7 times or more	4	1.0
Health insurance		
□ With	287	71.8
□ Without	113	28.2

Table 4.1. (Continued). Distribution of participants according to sociodemographics and health characteristics.

Category	Frequency	Percentage
Health status		
□ With diagnosed medical condition	29	7.2
□ Without diagnosed medical condition	371	92.8
High blood pressure history		
□ Yes	72	18.0
□ No	328	82.0
Diabetes family history		
□ None	322	80.5
□ Yes: grandparent, aunt, uncle or 1st cousin	60	15.0
□ Yes: parent, siblings or own child	18	4.5
High blood sugar history		
□ Yes	27	6.8
□ No	373	93.3
Waist circumference		
□ Male		
□ < 90 cm	168	42.0
□ 90-102 cm	40	10.0
□ >102 cm	5	1.3
□ Female		
□ < 80 cm	85	21.2
□ 80-88cm	62	15.5
□ >88 cm	40	10.0
Diabetes risk status		
□ High risk	106	26.5
□ Low risk	294	73.5

The data presents that a remarkably lower percentage of the adults reported to have a diagnosed medical condition (7.2%), however it may not reflect the real situation, since it appears that just about less than a half (39.5%) of the adults claimed to never sought a doctor in the last year. This means that only a minority of them had sought consultation or had been assessed by a healthcare provider. Among those who reported having a medical condition claimed to have hypertension, and rheumatoid arthritis.

Majority of the participants self-reported of not having a history of high blood pressure (82.0%), as well as not having a history of high blood sugar (93.3%); and not having a family history of diabetes (80.5%). To reiterate, this is congruent with the data that resulted to a greater number of the participants who has never sought consultation (39.5%) from a healthcare provider. This is also consistent with a remarkably higher percentage of adults earning the lowest monthly income bracket (84.3%) that could lead them to defer consultation from a medical doctor. The presence of a higher percentage of adults having health insurance (71.8%) could mean under utilization or less awareness on how to take advantage of the countrys' present healthcare system, in relation to the higher percentage of adults not seeking for healthcare consultation (39.5%).

Based on diabetes risk assessments, out of 400 respondents, 106 participants (26.5%) were classified as high risk for diabetes, while 294 respondents (73.5%) were grouped as low risk for diabetes. There are no data available that reports about the prevalence rate of undiagnosed diabetes at the local municipal level so that no benchmarking can be utilized as a comparison. However, the regional level, in Western Visayas, reported that around one out of five adult *Ilonggos* had diabetes (Pasaporte in Conserva, 2014), with a nearly similar statistics to this study, wherein around 1 out of 4 adults were found to be at high risk for diabetes. Table 4.1 show the distribution of participants according to different sociodemographic profile and health characteristics, respectively.

Level of Health Literacy Among Adults at Risk for Diabetes

Table 4.2. Itemized mean scores of the level of health literacy among adults at high and low risk for diabetes.

Item No.	QUESTION: On a scale of of very easy to difficult, how woud you say it is to…	HIGH RISK		LOW RISK	
		Mean	SD	Mean	SD
	HealthCare (HC)				
1	find information on treatments of illnesses that concern you?	2.27	0.526	2.32	0.554
2	understand the leaflets that come with your medicine?	2.55	0.649	2.71	0.509
3	judge the advantages and disadvantages of different treatment options?	2.32	0.610	2.60	0.530
4	call an ambulance in an emergency?	2.97	0.762	3.24	0.616
	Subscale Means & SD	2.53	0.627	2.72	0.646
	HC Subscale Literacy Index & Classification	**26** (Problematic)		**29** (Problematic)	
	Disease Prevention (DP)				
5	find information on how to manage mental health problems like stress or depression?	2.37	0.591	2.54	0.581
6	understand why you need health screenings?	2.51	0.680	2.65	0.531
7	judge which vaccinations you may need?	2.48	0.621	2.66	0.501
8	decide how you can protect yourself from illness based on advice from family and friends?	2.45	0.588	2.65	0.528
	Subscale Means & SD	2.45	0.621	2.61	0.538
	DP Subscale Literacy Index & Classification	**24** (Inadequate)		**27** (Problematic)	
	Health Promotion (HP)				
9	find out about activities that are good for your mental well-being?	2.45	0.620	2.61	0.521
10	understand information in the media on how to get healthier?	2.91	0.448	2.88	0.427
11	judge which everyday behavior is related to your health?	2.62	0.560	2.69	0.507
12	join a sports club or exercise class if you want to?	2.24	0.544	2.45	0.580
	Subscale Means & SD	2.55	0.596	2.66	0.534
	HP Subscale Literacy Index & Classification	**26** (Problematic)		**28** (Problematic)	
	General Health Literacy Means & SD	2.51	0.641	2.66	0.577
	General Health Literacy Index	**25**		**28**	
	General Health Literacy Classification	Inadequate		Problematic	

The level of health literacy among adults at high risk for diabetes (n=106) had a mean score of 2.51, with a standard deviation of 0.641, while the level of health literacy among adults at low risk for the diabetes (n=294) had a health literacy mean score of 2.66, with a standard deviation of 0.577. The equivalent health literacy indexes for adults at high risk and low risk for diabetes were 25 and 28, respectively.

Table 4.3. Summary of the level of health literacy among adults at high and low risk for diabetes.

	Profile		**Health Literacy**			
Diabetes Risk Status	F	%	Mean	SD	Literacy Index	Description
High Risk	106	26.5	2.51	0.641	25	Inadequate
Low Risk	294	73.5	2.66	0.577	28	Problematic

The health literacy index of those adults at high risk for diabetes were considered to be inadequate, while the health literacy index of those adults at low risk for diabetes where classifed as problematic. THE HLS-EU originally allows categorization of study population, either by four as well as two levels of health literacy. Inadequate literacy level means a health literacy level less than or equal to 50% of the perfect health literacy index, while problematic health literacy level means a health literacy level of greater than 50% but less than 66% of the perfect health literacy index. Furthermore, both categories, inadequate and probematic health literacy can be both categorized as limited health literacy, wherein health literacy index scores ranges between 0% to 66% (Denuwara & Gunawardena, 2017) of the perfect health literacy index.

Table 4.3 shows the summary of the overall level of health literacy among adults at high and low risk for diabetes. An item-by-item mean score of the health literacy tool is presented in Table 4.2 for in-depth analysis. The levels of health literacy among adults at high and low risk for diabetes were measured using the 12-item health literacy questionnaire. The health literacy tool has three subscales, namely: healthcare, disease prevention and health promotion. The items were measured on a four point Likert-type scale in which 1 is very difficult and 4 is very easy. Respondents were asked to respond to questions in terms of how easy or how difficult it is for them to find, understand, judge and apply health information.

The result of the descriptive statistics shows the presence of low and limited levels of health literacy, both in adults at high risk for diabetes (M=2.55, SD=0.641) and low risk for diabetes (M=2.66, SD=0.577). However, the adults at low risk for diabetes, although considered as having a limited level of health literacy index, have a higher level of health literacy index than the adults with high risk for diabetes. Specifically, among the three health dimensions of health literacy, the disease prevention subscale got the lowest health literacy mean scores for both adults at high risk (M=2.45, SD=0.621) and low risk for diabetes (M=2.61, SD=0.538).

The disease prevention subscale had the worst health literacy indexes for both adults at high risk and low risk for diabetes, with health literacy indexes of 24 and 27, which is considered as inadequate health literacy for adults at high risk for diabetes, while problematic health literacy for adults at low risk for diabetes. Both descriptions of health literacy are considered limited health literacy (Denuwara & Gunawardena, 2017) with inadequate health literacy being lower than problematic

health literacy (Sorensen et al, 2012; HLS-EU-Q47 Consortium, 2011). The results practically implied that both adults at high risk and low risk for diabetes have difficulties in finding, understanding, judging and applying health information with the worst regard to disease prevention. Adults at high risk for diabetes have a hard time accessing information regarding medical issues and accessing information on their risk factors for health, as they have the lowest mean scores in their capacity to find information regarding healthcare (M=2.27, SD=0.526) and to access information regarding disease prevention (M=2.37, SD=0.591). It is also important to note that adults at high risk for diabetes had the lowest mean score in their ability to apply health information (M=2.24, SD=0.544) as regards to what determines the promotion of health in their physical and social environment, such as joining sports club or doing physical exercises.

An opposite trend between the subscales of healthcare and health promotion exists when adults at high risk and low risk for diabetes are compared. The adults at high risk for diabetes have a higher mean score in health promotion (M=2.55, SD=0.596) than in healthcare (M=2.53, SD=0.627), while the adults at low risk for diabetes have a higher mean score in healthcare (M=2.71, SD=0.646) than in health promotion (M=2.66, SD=0.534). The disparity between the non-uniform trends in health promotion and healthcare mean scores between the two groups could be ascribed to a greater percentage of the adults classified as low risk for diabetes having low socioeconomic status, which could be linked to greater use of healthcare services (Droomers & Westert, 2004; Frie et al, 2009) compared to their high risk for diabetes counterpart, but still with consistent suboptimal regular visits to a healthcare provider, as evidenced by a higher percentage of adults visiting a medical doctor at

least 1-3 times (57%) in a year compared to those who had never seen one (39.5%). Relatively, the highest mean score is in utilizing information in the case of seeking care and health treatments (M=3.24, SD=0.616). This has both favorable and unfavorable consequences. A favorable example of which is when adults at low risk for diabetes, have the ability to make informed decisions on medical issues, such as when is the proper time to consider that a situation is an emergency so that calling an ambulance is deemed appropriate.

The result of the study is consistent with results of other research that involved population with lower socio-economic status in local studies (Briones, 2017; Agosto, Briones & Palatino, 2018). This is also parallel to the findings of most international studies among general adults (Jordan, 2015; Wei Sheng, 2015; Ivanov et al, 2015, Choi et al, 2013, Coffman et al, 2012 & Cajita et al, 2017) that revealed low, limited, problematic, or inadequate health literacy descriptions among its study population. However, the results of the study are in contrast to the results of studies that showed sufficient and acceptable health literacy (Chahardah-Cherik et al, 2017; de Castro, Brito & Gomes, 2014; Tol, Pourreza, Tavasoli & Rahimi, 2012) among adults with diagnosed diabetes. Difference in the results could be credited to the fact that the population mentioned in these studies were among adults already diagnosed with diabetes, compared to the studies mentioned earlier which were among general adults. Furthermore, higher prevalence of limited health literacy was reported in population surveyed in the community compared with those who attended primary care or hospitals (Abdullah, Liw, Salim, Ng & Chinna, 2019).

A general pattern can be seen that low risk for diabetes group, although considered as having low levels of health literacy, still have better health literacy indexes compared to the high risk for diabetes group in all three health dimensions. It implies that the adults in low risk and high risk for diabetes groups have poor knowledge, with a similarly least knowledge in disease prevention. With the adults at high risk for diabetes having lower health information competencies, than the adults at low risk for diabetes, they will have more difficulty to understand health information, as well as more inefficient method of implementing what was understood. Furthermore, this could be worsen by their incompetence in judging the health information obtained, if fortunately they have the skills to find them at the first place.

Level of Health Promoting Behaviors Among Adults at Risk for Diabetes

The level of health promoting behaviors among adults at high risk for diabetes (n=106) had a mean score of 2.32, with a standard deviation of 0.708, while the level of health promoting behaviors among adults at low risk for the diabetes (n=294) had a mean score of 2.29, with a standard deviation of 0.635. The health promoting behaviors of adults at high risk and low risk for diabetes were both considered as negative health promoting behaviors. Table 4.5 shows the summary of the overall level of health promoting behaviors among adults at high and low risk for diabetes, while Table 4.4 presents an item-by-item mean scores of the health promoting behavior tool for in-depth analysis.

Table 4.4. Itemized mean scores of the level of health promoting behaviors among adults at high and low risk for diabetes.

Item No.	QUESTIONS	HIGH RISK		LOW RISK	
		Mean	SD	Mean	SD
	Health Responsibility (HR)				
3	Report any unusual signs or symptoms….	2.26	0.574	2.09	0.481
9	Read or watch TV programs about improving…	2.54	0.664	2.57	0.608
15	Question health professionals in order to….	2.55	0.537	2.36	0.516
21	Get a second opinion when I question my…	2.16	0.554	2.15	0.477
27	Discuss my health concerns with health prof…	2.26	0.522	2.16	0.408
33	Inspect my body at least monthly for physical…	2.13	0.587	2.20	0.589
39	Ask for information from health professionals…	2.32	0.578	2.14	0.421
45	Attend educational programs on personal..	2.17	0.467	2.17	0.542
51	Seek guidance or counseling when necessary.	2.10	0.768	1.93	0.667
	Subscale Means & SD	2.28	0.607	2.20	0.555
	HR Subscale Classification	Negative		Negative	
	Physical Activity (PA)				
4	Follow a planned exercise program.	1.94	0.838	2.10	0.622
10	Exercise vigorously for 20 or more minutes…	1.89	0.681	2.04	0.586
16	Take part in light to moderate physical activity.	2.01	0.655	2.02	0.560
22	Take part in leisure-time physical activities…	1.89	0.681	1.92	0.581
28	Do stretching exercises at least 3 times per…	2.13	0.757	2.10	0.670
34	Get exercise during usual daily activities.	2.07	0.694	2.05	0.593
40	Check my pulse rate when exercising.	1.80	0.696	1.85	0.730
46	Reach my target heart rate when exercising.	1.76	0.684	1.90	0.676
	Subscale Means & SD	1.94	0.720	1.99	0.635
	PA Subscale Classification	Negative		Negative	
	Nutrition (N)				
2	Choose a diet low in fat, saturated fat…	2.05	0.709	2.21	0.598
8	Limit use of sugars and food containing sugar.	2.03	0.683	2.25	0.637
14	Eat 6-11 servings of bread, cereal, rice…	2.36	0.706	2.48	0.627
20	Eat 2-4 servings of fruit each day.	2.08	0.472	2.10	0.383
26	Eat 3-5 servings of vegetables each day.	2.49	0.680	2.46	0.587
32	Eat 2-3 servings of milk, yogurt or cheese…	1.95	0.559	2.11	0.550
38	Eat only 2-3 servings from the meat, poultry, fish	2.24	0.508	2.18	0.411
44	Read labels to identify nutrients, fats,	2.23	0.734	2.34	0.702
50	Eat breakfast.	2.74	0.832	2.83	0.701
	Subscale Means & SD	2.24	0.702	2.33	0.626
	N Subscale Classification	Negative		Negative	

Table 4.4 (Continued). Itemized mean scores of the level of health promoting behaviors among adults at high and low risk for diabetes.

Item No.	QUESTIONS	HIGH RISK		LOW RISK	
		Mean	SD	Mean	SD
	Spiritual Growth (SG)				
6	Feel I am growing and changing in positive ways.	2.44	0.587	2.46	0.551
12	Believe that my life has purpose.	1.95	0.486	2.77	0.541
18	Look forward to the future.	2.95	0.523	2.85	0.482
24	Feel content and at peace with myself.	2.95	0.575	2.85	0.521
30	Work toward long-term goals in my life.	2.62	0.762	2.39	0.639
36	Find each day interesting and challenging.	2.50	0.636	2.28	0.508
42	Am aware of what is important to me in life.	2.84	0.619	2.71	0.596
48	Feel connected with some force greater than…	2.30	0.588	2.24	0.548
52	Expose myself to new experiences…	2.35	0.553	2.23	0.481
	Subscale Means & SD	2.66	0.647	2.53	0.596
	SG Subscale Classification	Positive		Positive	
	Interpersonal Relationship (IR)				
1	Discuss my problems and concerns with people…	2.30	0.650	2.32	0.571
7	Praise other people easily for their achievements.	2.47	0.620	2.55	0.563
13	Maintain meaningful and fulfilling relationships…	2.60	0.657	2.48	0.571
19	Spend time with close friends.	2.53	0.620	2.40	0.511
25	Find it easy to show concern, love and warmth…	2.64	0.572	2.61	0.522
31	Touch and am touched by people I care…	2.39	0.656	2.40	0.561
37	Find ways to meet my needs for intimacy.	2.46	0.588	2.31	0.538
43	Get support from a network of caring people.	2.10	0.872	1.96	0.758
49	Settle conflicts with others through discussion…	2.22	0.478	2.22	0.523
	Subscale Means & SD	2.41	0.662	2.36	0.601
	IR Subscale Classification	Negative		Negative	
	Stress Management (SM)				
5	Get enough sleep.	2.67	0.565	2.72	0.544
11	Take some time for relaxation each day.	2.51	0.606	2.45	0.544
17	Accept those things in my life, which I cannot…	2.33	0.581	2.21	0.487
23	Concentrate on pleasant thoughts at bedtime.	2.89	0.421	2.77	0.522
29	Use specific methods to control my stress.	1.97	0.798	1.96	0.707
35	Balance time between work and play.	2.28	0.727	2.26	0.637
41	Practice relaxation or meditation…	1.90	0.850	1.81	0.712
47	Pace myself to prevent tiredness.	2.49	0.539	2.40	0.568
	Subscale Means & SD	2.38	0.719	2.32	0.673
	SM Subscale Classification	Negative		Negative	
	General Health Promoting Behavior Means & SD	**2.32**	**0.708**	**2.29**	**0.635**
	General Health Promoting Behavior Classification	**Negative**		**Negative**	

Table 4.5. Summary of the level of health promoting behaviors of adults at high and low risk for diabetes.

	Profile		Health Promoting Behavior		
Diabetes Risk Status	F	%	M	SD	Description
High Risk	106	26.5	2.32	0.708	Negative
Low Risk	294	73.5	2.29	0.635	Negative

Analysis of the subscales of health promoting behavior shows consistently negative health promoting behaviors (M< 2.5) in five health promoting behavior subscales, except in the spiritual growth subscale, which has a positive health promoting behavior for both adults at high risk (M=2.66, SD=0.647) and low risk for diabetes (M=2.53, SD=0.596). Among the six subscales of health promoting behaviors, the lowest health promoting behavior mean scores are in the physical activity (PA) subscales, both in the high risk group (M=1.94, SD=0.720) and the low risk group (M=1.99, SD=0.635), while the highest health promoting behavior scores are in the spiritual growth (SG) subscales, both in the high risk group (M=2.66, SD=0.647) and the low risk group (M=2.53, 0.596).

The results of this study are the same with the results of other studies conducted on other chronic diseases (Maheri, Sadeghi & Shojaeizadeh et al, 2016; Mohsenipoua, Majlessi, Shojaeizadeh et al, 2016) and adults stratified to different levels of diabetes risk (Sutherland et al, 2012), which revealed that the levels of physical activity and the levels of spiritual growth are the subscales with the lowest and highest levels, respectively. The data implies that in adults with high risk for diabetes, the physical dimensions represented by the subscales of nutrition and physical activity were having uniformly lower scores than those adults with low risk

for diabetes. In contrast, health behavior subscales of those adults at high risk for diabetes that appeal to the psychological, spiritual and social aspects were having consistently higher scores compared to the adults at low risk for diabetes. It could mean that adults at high risk for diabetes have a fairly lower physical health behavior scores, but a fairly higher psychosociospiritual health behavior scores than those adults at low risk for diabetes. A study among diabetic and non-diabetic adults in Brazil (de Oliveira, Maia, Silva, Martins & Claro, 2018), showed a partially consistent analogous results where people with diabetes had better dietary habits than those without diabetes, but still had risk behaviors such as insufficient physical activity. It is remarkable to note that if adults at high risk for diabetes are to be considered as future diabetics, while adults at low risk for diabetes remain to be non-diabetics, it could imply that health promoting behaviors in different subscales could vary in results but in non-uniform directions. To wit, one subscale may connote desirable health behaviors but the other as the opposite.

When health promoting behavior subscales are compared between high risk and low risk for diabetes group, the adults at high risk for diabetes have better health promoting behavior scores in the subscales of health responsibility (M=2.28, SD=0.607), spiritual growth (M=2.66, SD=0.647), stress management (M=2.32, SD=0.708) and interpersonal growth (M=2.41, SD=0.662), than those levels of health responsibility (M=2.20, SD=0.555), spiritual growth (M=2.53, SD=0.596), stress management (M=2.29, SD=0.635) and interpersonal relationship (M=2.36, SD=0.601) of adults at low risk for diabetes. On the other hand, the physical activity (M=1.99, SD=0.635) and nutrition (M=2.33, SD=0.626) subscales of those adults at low risk for diabetes are higher compared to the physical (M=1.94, SD=0.720) and

nutrition (M=2.24, SD=0.702) subscale mean scores of adults at high risk for diabetes. It could mean that the adults at high risk for diabetes engage less frequently in doing physical exercises and do not monitor their nutrition more regularly than the adults at low risk for diabetes. It could be interpreted that the adults at high risk for diabetes have worse health promoting behaviors in the said subscales, in comparison to the adults at low risk for diabetes.

The results of this study is similar to the results of a study among low income, low education, middle aged Hispanics (Sutherland et al, 2012), which reports a higher mean scores of health responsibility, interpersonal relationship and stress management on those adults with higher risk for diabetes than those adults with lower risk for diabetes. However, in the said study the main effect of gender, influencing the difference, which favors the female, was observed only in the health responsibility and stress management subscales (Sutherland et al, 2012). In the case of health responsibility, an example to better understand this situation is that in developing countries, health decisions are often not made by individuals, but are made collectively by family members. This is a cultural difference among the Filipino adults, especially in the rural setting, wherein on a particular issue, an individuals such as a husband, would make decision on behalf of his wife (Qureshi, Sheikh, Khowaja, et al, 2016).

Difference in Health Literacy Between Adults at High Risk and Low Risk for Diabetes

Table 4.6 shows the computed statisic t value for independent's t test. The t value is -4.61. The p-value is < .000 and is significant at p < .05. The null hypothesis is rejected and the alternate hypothesis is accepted. There is sufficient evidence that there is a significant difference between the level of health literacy among adults at high risk and low risk for diabetes, t (398)=-4.61, p= .000, at 0.05 level of significance.

Table 4.6. Differences in health literacy mean scores of adults grouped according to diabetes risk status: high risk vs. low risk.

Health Literacy	M	*SD*	*df*	t-value	Effect Size *Hedges' g*	p-value	Sig
High Risk (n=106)	2.51	0.285	398	-4.61*	0.50	.000*	S
Low Risk (n=294)	2.66	0.281					

*p<.05

It can be implied that the high risk for diabetes group (M=25.20, SD=4.76) showed significantly worse health literacy levels compared to the low risk for diabetes group (M=27.66, 4.69). Morever, [g]Hedges' r= 0.50 meant a medium effect size, which is a zone of desired effect. Hedges g is an effect size that is appropriate when two sample sizes have similar standard deviation, but different sample size (Hedges & Olkin, 1985). This implies that the adult's level of risk for developing diabetes had a medium magnitude effect on the differences between their health literacy levels. Similarly, the difference between the levels of health literacy concerning the two groups of adults is practically important, wherein variances in the level of adult's risk for diabetes could have a moderate effect on their levels of health

literacy. However, caution is advised about the temporarility of the results between the two variables, since this a cross-sectional study.

Detailed inspection between the health literacy indexes among adults at high and low risk for diabetes, consistently shows an estimated 3 to 4 health literacy index score differences between the two groups, in all three different health literacy subscales. Furthermore, the mean scores in the itemized analysis of each health literacy subscale between adults at high and low risk for diabetes, show a steadily lower mean scores in the adults at high risk for diabetes than the adults at low risk for diabetes. This could be the notable reason for the existing statistically and practically signficant differences between the two groups of adults. This additionally confirms the results of the data suggesting that the degree of risk for diabetes had an effect on the level of of health literacy of adults, making adults at high risk for diabetes more susceptible to being incompetent in finding, understanding, judging and applying health information in all three health dimensions, namely: healthcare, disease prevention and health promotion.

Most studies show the difference between the health literacy of adults when they are grouped according to their sociodemographic characteristics. This current study offers a plausible reason about the influence of diabetes risk level on the health literacy levels of adults. This provide key areas in which adults can be supported to access, understand, and use health information and have implications for healthcare providers and organizations seeking to improve health outcomes and reduce health inequalities for adults with risk for developing diabetes.

This is particularly relevant for government agencies aiming to improve access for adults that are less engaged with services, especially in the disease prevention aspect. The identification of the areas of difficulty for both adults at high and low risk for diabetes lead these results highly relevant for healthcare providers to intervene at access points such as when adults approach to avail healthcare service, receive information, or opt to participate in health promotion. Due to the presence of limited operation cost and low health budget, decision making on the appropriation of financial assets can be guided by identification of adults who are in the highest need for health education and prioritizing those groups who are in dire need for healthcare, and maximizing the personal resources of individuals to promote health and prevent progression of diabetes.

Difference in Health Promoting Behaviors Between Adults at High Risk and Low Risk for Diabetes

Table 4.7 shows the independent's t test for determining the significant difference between the level of health promoting behaviors of adults at high and low risk for diabetes. The computed statisic t value is 1.18 and the p-value is < .238. The result is NOT significant at 0.05 level of significance. Thus, there is insufficient evidence to reject the null hypothesis. It can be concluded that there was no statistically significant difference between the health promoting behaviors of adults, t(398)=1.18, p= .238, despite the adults at high risk for diabetes (M=2.29, SD= 0.21) attaining a slightly worse health promoting behavior than those adults at low risk for diabetes (M=2.32, SD=0.23).

Table 4.7. Differences in health promoting behavior among adults grouped according to diabetes risk status: high risk vs. low risk.

Health Behaviors	M	*SD*	*df*	t-value	p-value	Sig
High Risk (n=106)	2.32	0.227	398	1.18	.238	NS
Low Risk (n=294)	2.29	0.211				

*p <.05

It implies that the overall level of health promoting behaviors among adults at high risk and low risk for diabetes are just the same. This is consistent with the findings of a study among low-income Latino adults that states no significant differences between adults in different levels of diabetes risk when it comes to their level of engagement in physical activity, extent of monitoring nutrition and owing one's own health responsibility (Sutherland et al, 2012).

The itemized analysis of the mean scores between the health promoting behaviors of adults at high and low risk for diabetes in all the different subscales are somehow equal when the scores are rounded off to the nearest whole number. Furthermore, although differences in the average means of all the health promoting behavior scores are around 0.05-0.10; differences are somehow not uniform in directions in all subscales. Whereas, nutrition and physical activity subscales have lower mean scores in the high risk for diabetes group, as compared to the low risk for diabetes group, while interpersonal relationship, stress management, health responsibility and spiritual growth subscales have higher mean scores in the high risk for diabetes group, as compared to the low risk for diabetes group.

The results of statistical testing that reveal a no significant difference between the health promoting behavior mean scores of adults at high and low risk for diabetes denote that adoption of risk reduction behavior among the entire population of adults, with special regards to the level of physical activity and nutrition, are suboptimally homogeneously low. Thus, an all adult inclusion efforts is needed to improve awareness of the degree of risk for developing diabetes, increase promotion of healthy behaviors and advance availability of evidence-based lifestyle interventions to reduce the growth in new cases of diabetes. The results of this study could not rule out the effect of the adult's level of risk for diabetes on the level of their health promoting behaviors. However, it could imply that the sample of adult population seem to give priority to better their spirituality than to adopt healthy behaviors in other health behavior subscales as evidence by higher spiritual behaviors scores, but still had the same level of health behaviors despite their degree of diabetes risk. Most studies consistently reports low level of health promoting behaviors among adults in a low income and rural setting.

A probable explanation about the lacking influence of diabetes risk level on health promoting behaviors could be supported by the absence of studies from low and middle-income countries that could show association between health promoting behaviors and reduction in diabetes risk, particularly one that employed higher hierarchial research evidence (Bureeler et al, 2017). This result is further supported by a sensitive analysis study (Feldman et al, 2017) which reveals that there is no single health promoting behavior that drives the relationship between diabetes risk and health behaviors, suggesting that there could be interactive effects with other

variables. One suggestive independent variable in this study is health literacy, where a significant difference between adults at high and low risks for diabetes do exists.

Relationship Between Health Literacy and Health Promoting Behavior Among Adults at High Risk for Diabetes

Before determining the correlation between health literacy and health promoting behaviors of adults at risk for diabetes, a QQ plot for both the health literacy indexes and health promoting behavior scores are shown in Figure 4.1 and Figure 4.2. The purpose of Quantile-Quantile (QQ) plot is to visually show if two data sets come from the same distribution (Wilk & Gnanadesikan, 1968). The QQ Plots in Figures 4.1 and 4.2 show visually that the health literacy indexes and health promoting behavior scores approximately lie on the line y=x. Several outliers can be seen in the plot, but due to a large number of sample size, n=106; the assumption of a normal distribution can be valid (Ghasemi & Zahediasl, 2012). The two data samples, if compared, seems to follow a 45 degrees line y=x. The plots compares to a distribution of samples similar to a normal standard distribution (Thode, 2002). On the other hand, Figure 4.3 shows the scatterplot for health literacy and health promoting behaviors among adults at high and low risk for diabetes. The scatterplot presents generally a concentrated health literacy indexes and health-promoting behavior scores nearly to the center of distribution, with several scattered outliers noted.



Figure 4.1. QQ Plot of health literacy indexes of adults at high risk for DM.

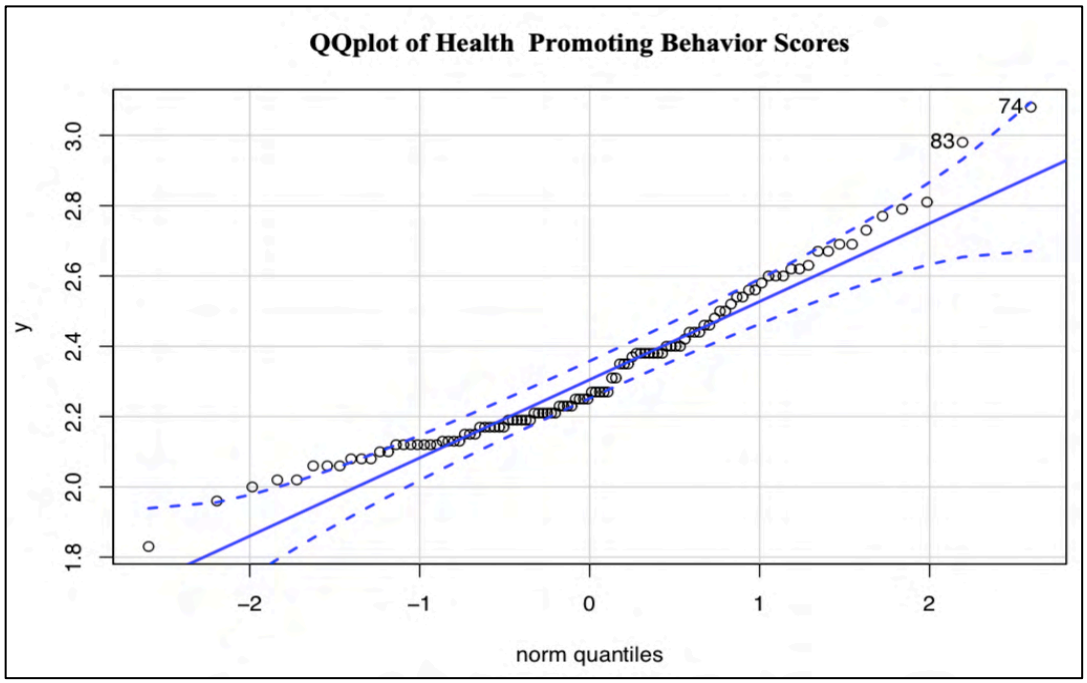


Figure 4.2. QQ Plot of health behavior scores of adults at high risk for DM.

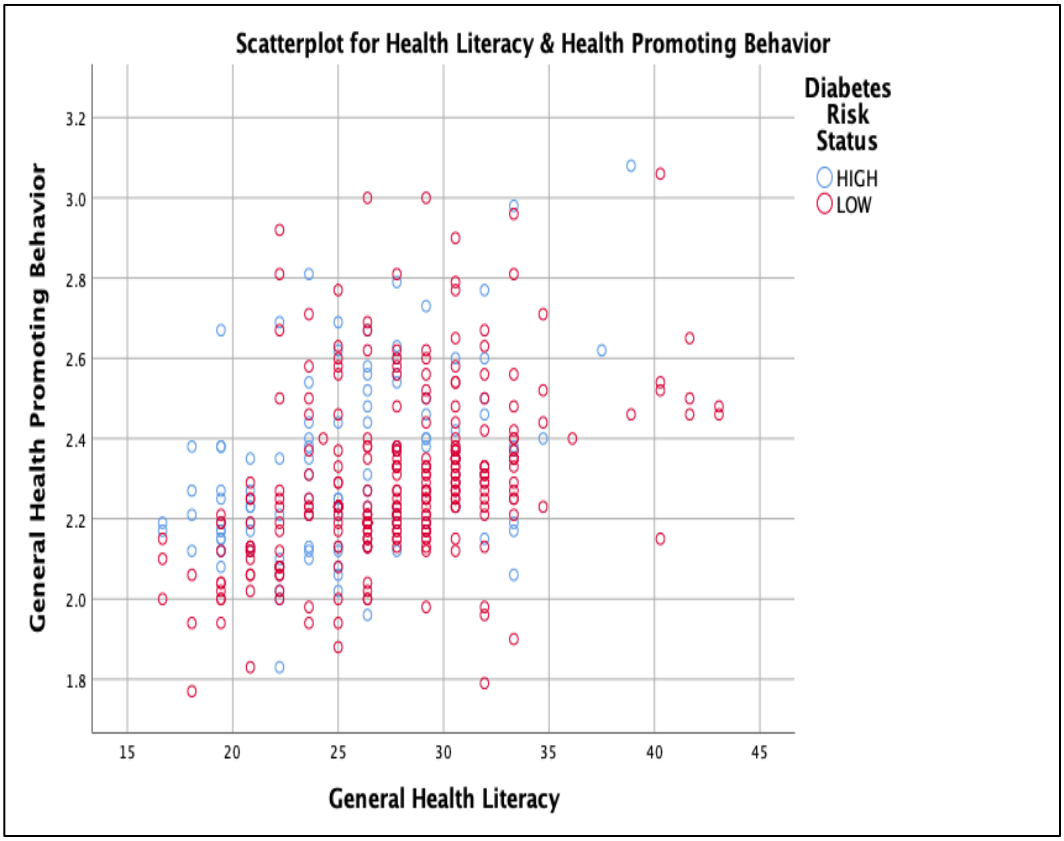


Figure 4.3. Scatterplot for health literacy and health promoting behaviors among adults at high and low risk for diabetes.

Table 4.8. Correlation matrix showing the relationship between health literacy and health promoting behaviors among adults at high risk for diabetes.

Health Literacy and Health Promoting Behavior	**Adults at High Risk for DM**
Pearson *r*	.434*
N	106
p-value	.000
Sig	Significant
Interpretation	Weak Positive

*p<.05

Table 4.8 shows that there is a weak positive correlation, but a highly significant relationship between the health literacy and health promoting behaviors of adults at high risk for diabetes. In contrast, a coefficient value of r= 0.43 is considered as a medium strength of positive association (Cohen, 1988; Cohen, 1992

in McLeod, 2019). Among the participants that were classified as high risk for diabetes (n=106), their health literacy indexes and health promoting behavior scores were moderately positively correlated, r (104)= .434, p< .000. This implies that their health literacy indexes have significantly influenced their health promoting behaviors, and/or vice-versa. Likewise, the higher is the health literacy; the better is the health promoting behavior. It can be implied also, that around 19% of the variation in the health literacy indexes of adults at high risk for diabetes would account for the same amount of directly proportional increase in their health promoting behavior mean scores. There are numerous data that exists in literature about the relationship that is present between health literacy and health-promoting behaviors among healthy adults, or even for individuals with low disease risk (Hansen, Shneyderman & Belcastro, 2015; Wong et al, 2017; Suka, 2015; Shin & Lee, 2018). However, there is a conflicting study that reports no significant association between health literacy and some measures of health outcomes in a random sample of adults who were already diagnosed of diabetes (Singh & Aiken, 2017) in Western Jamaica.

Accounting for the low scores in health literacy indexes, with respective low health promoting behavior scores among adults at high risk for diabetes, a positive correlation could be expected between the two variables. However, a weak, moderate magnitude of correlation could be credited to the non-uniform variation of the direction of scores in all the subscales of health promoting behavior. To wit, nutrition and physical activity subscale have a lower health promoting behavior, while interpersonal relationship, health responsibility, and stress responsibility have higher health promoting behavior scores among adults at high risk for diabetes in comparison to adults at low risk for diabetes. A significant weakening in the

correlation could be ascribed greatly to a surprisingly higher spiritual behavior scores among adults at high risk for diabetes, which could pull up a supposedly lower general health promoting behavior mean scores (excluding the spiritual subscale), in relation to a uniformly lower health literacy indexes.

A meta-analysis report (Al Sayah, Majumbar et al, 2012) among 723 eligible studies, about the relationship between health literacy and health outcomes, also proposes that there are still insufficient or inconsistent evidences that independently associate health literacy to health outcomes in adults diagnosed with diabetes. Thus, it is still premature to advance research with higher hierarchial evidence, since there are still no sufficient data to suggest independent relationship between health literacy and health outcomes. On the contrary, this study presents that a positive correlation between health literacy and health-promoting behavior among adults at high risk for diabetes significantly does exists. Discrepancies in the results between the current study and the previous studies mentioned could be explained by the difference in the characteristics of the study samples, wherein most studies exploring the relationship between health literacy and health behaviors are conducted among adults already diagnosed with diabetes.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATION

Summary

This descriptive correlational research design study determined the level of health literacy and the level of health promoting behaviors of adults, classified as high risk and low risk for diabetes based on their diabetes risk scores. Moreover, it has established the differences between the level of health literacy and the level of health promoting behaviors, when adults are grouped according to their diabetes risk. Lastly, it has proven the existing correlation between health literacy and health promoting behaviors of adults at high risk for diabetes. The study utilized a proportionate stratified sampling design, by age and sex, at the initial selection of 500 participants from all adults, aged 18-59 years, in Brgy. Vizcaya, President Roxas, Capiz. There were 67 ineligible samples excluded based on the inclusion and exclusion criteria. A total of 433 participants met the inclusion criteria. Hence, 433 questionnaires were utilized during the whole duration of home visits and 400 questionnaires were returned and verified as having complete data. The home visits were conducted according to data collection protocols, which started on October 29, 2019 and ended on November 11, 2019, with a 92.4% return rate and 80% response rate.

Findings

The sociodemographic profile of the sample population, were reflective of the total population based on the proportion of age and sex (Cabales, Fernando & Obal, 2019). The participants were mostly males (53.3%), young adults, aged 18-44 years

old (71.3%), married (70.8%), had at least a highschool level of education (47.3%), and a nuclear type of of family structure (62.7%). In contrast, although a remarkably lower population claimed to have medical condition, including hypertension and rheumatoid arthritis (7.2%), and surprisingly a higher percentage of health insurance coverage (71.8%), it did not reflect the real situation, since it appears that about less than half of the adults claimed that they never sought a doctor for consultation in the last year (39.5%). This meant that only a few of them were assessed by a healthcare provider and only a minority of them knew how to take advantage of the government's healthcare system. Relatively, the less likelihood of seeking medical consultation can be attributed to participants who claimed of not being employed (50.2%) and earning the lowest bracket (84.3%) of monthly income (≤ 5,000 Php).

Most of the respondents had visited a healthcare provider at least 1-3 times in a year (57.0%), which could be the reason for a remarkably higher percentage of participants, who self-reported of not having a history of high blood pressure (82.%), as well as not having a history of high blood sugar (93.3%) and not having a family history of diabetes (80.5%). If self- reports are to be assumed reliable, and backed up with a biophysical measurement, such as measures of increase in waist circumference beyond normal denoting a higher risk for diabetes (35.5%), it is most probably true that around a quarter of participants were considered at high risk for diabetes (26.5%) and the remaining are considered to be at low risk (73.5%). This is somehow nearly congruent to the West Visayas regional statistics report stating that about 1 out of 5 *Ilonggo* adults (20%) are pre-diabetic (Pasaporte in Conserva, 2014). However, it is less than the estimated national prevalence rate of 52.5% undiagnosed diabetes among adults in the Philippines (IDF, 2015).

The level of health literacy among adults at high risk and low risk for diabetes were found out to be limited, with the high risk for diabetes group having a lower level of health literacy index, compared to the low risk for diabetes group. Most studies involving population with lower socio-economic status had lower health literacy level results (Briones, 2017; Agosto, Brioners & Palatino, 2018). This is in contrast to the results of studies that showed sufficient and acceptable level of health literacy, but it involves adults who had already been diagnosed with diabetes (Chahardah-Cherik et al, 2017; de Castro, Brito & Gomes, 2014; Tol, Pourreza, Tavasoli & Rahimi, 2012) and adults in urban settings (Hansen et al, 2015). Descriptive statistics revealed an interpretation of inadequate level of health literacy for high risk for diabetes group, while problematic level of health literacy among the low risk for diabetes group. Furthermore, both high and low risk for diabetes groups have the lowest health literacy in the subscale of disease prevention. It is remarkable to note that the health literacy subscale scores of the adults at high risk for diabetes were lower compared to their low risk for diabetes counterpart.

The level of health promoting behavior among adults at high and low risk for diabetes were low and undesirable, with descriptive statistics revealing an interpretation of negative health promoting behavior for both groups. Adults at high and low risk for diabetes had the lowest health promoting behavior scores in the physical activity subscale, but the highest health promoting behavior scores in spiritual growth. It is important to note that the health promoting subscales among adults at high and low risk for diabetes have non-uniform direction of variation in mean scores. High risk for diabetes group had lower health promoting behavior scores in the subscales of physical activity and nutrition compared to the low risk

group. On the contrary, the low risk for diabetes group had lower health promoting behavior scores in the subscales of health responsibility, stress management, spiritual growth and interpersonal growth than the low risk for diabetes group.

The inferential statistics showed a significant difference between the general health literacy among adults at high and low risk for diabetes. On the other hand, there was no statistically significant difference in the health promoting behaviors of adults grouped as high and low risk for diabetes. Lastly, correlation between health literacy and health promoting behaviors of adults at high risk for diabetes showed a statistically significant relationship with positive weak correlation strength.

Conclusions

Based on the findings of the study, the following conclusions were derived:

1. The adults, both in the high and low risk for diabetes, had considerably limited health literacy, with the adults at high risk for diabetes having inadequate health literacy, while adults at low risk for diabetes having problematic health literacy. The level of health literacy of the sample of adults was reflective of the sociodemographic characteristics that are present in the majority of the adults having lower levels of education, low levels of monthly income, higher unemployment percentage, and greater number of adults who had never seen a doctor in a year.

2. The adults, both in the high and low risk for diabetes, had remarkably negative health promoting behaviors; both considered as undesirable health promoting behaviors. The level of health promoting behaviors of adults was

also reflective of the rural setting based on their sociodemographic, economic, and health characteristics. Owing to the low socioeconomic status of the higher percentage of the sample population, it has an implication on the availability of financial resources, which the adults can utilize for their health promotion, health maintenance and disease prevention. This is coherent to the fact that disease prevention had the worst health literacy subscale for both adults at high and low risk for diabetes.

3. There is a statisitically significant difference between the health literacy of adults at high and low risk for diabetes. The high risk for diabetes group had worse health literacy compared to the low risk for diabetes group. The result of this study is parallel to the findings of most international studies (Jordan, 2015; Wei Sheng, 2015; Ivanov et al 2015, Choi et al, 2013, Coffman et al, 2012 & Cajita et al, 2017) and local research (Briones et al, 2015; Agosto, Briones & Palatino, 2018) that concluded low, problematic or inadequate health literacy among its study population.

4. There is no statistically significant difference between the health promoting behaviors of adults at high and low risk for diabetes. This is reflected in the presence of non-uniform direction between the variations of mean scores of the different subscales of health behaviors when adults are grouped into high and low risk for diabetes. Whereas, the adults at high risk for diabetes have lower physical activity and nutrition mean score, but higher health responsibility, spiritual growth, interpersonal relationship and stress management mean scores in comparison to the adults at low risk for diabetes.

This results were both congruent to a cohort study which utilized a non-probability sampling that found out no significant differences between the levels of physical activity, extent of monitoring nutrition and degree of taking health responsibility among adults in different levels of diabetes risk (Sutherland et al, 2012). Thus, health behavior is still a complex phenomenon influenced by several factors and needs additional research. This study also supports previous research that found out no association between some dimensions of health literacy and other aspects of health behaviors (Friis et al, 2016).

5. There is a significant positive relationship between the health literacy and health promoting behavior of adults at high risk for diabetes. This is consistent with the results of other researchers who worked on population of adults with already known cardiovascular diseases (Aaby et al, 2017), infectious respiratory diseases (Sun et al, 2013) and diabetes (Wang et al, 2016; Zung-Yeh, 2018; Kim et al, 2018; Shin & Lee, 2018; Niknami et al, 2018; Chaharda Cherik et al, 2017). This is an additional supporting literature for health promoting behavior model (Pender, 2009) and the HLS-EU conceptual model (Sorensen et al, 2012) that strengthens theory of the existing relationship between health behavior and health literacy.

Recommendations

1. The classification of adults according to diabetes risk had brought light to the fact that adults in the rural setting do not only have low level of health literacy, but an alarming inadequate health literacy. This is evident in

adults at high risk for diabetes, inclined to have worse health literacy compared to those adults who have low risk for diabetes. The total inclusion of adults with low health literacy in health education could avoid the worsening effects of diabetes in the underprivilege population (Schillinger, Grumbach & Piette et al, 2002). Since health literacy could influence health behavior, improving the health literacy among these adults could impact health outcomes, such as prevention of developing diabetes, and in the long term save healthcare costs in the society.

2. The study utilized a large sample size, implemented a random probability sampling technique, and garnered a high response rate and return rate. This is a good representation of the target population regarding adults in the rural setting. It was found out in this study that even in the rural setting, especially in adults with high risk for diabetes, health literacy has a positive significant relationship with health promoting behaviors. Thus, healthcare workers need to focus on increasing the health literacy of adults, especially those who are at high risk for diabetes, to facilitate development of health promoting behaviors. Low health literacy can be addressed by educating persons to become more resourceful and making a situation less demanding.

3. This study was only limited to diabetes risk factors such as age, sex, waist circumference, family history of diabetes, history of high blood sugar, history of high blood pressure and measurement of waist circumference to estimate diabetes risk levels. Health literacy and health behaviors might be

different in adults who have already been diagnosed of diabetes, either of Type 1 DM or Type 2 DM. However, the tool for estimating diabetes risk levels could be helpful in healthcare workers who have less training, since it is practical, cost effective and easy to implement. Such diabetes risk assessment could be essential in prioritizing individuals who have in dire need for health education on diabetes disease prevention. The findings emphasized that healthcare providers must identify low health-literate adults at high risk for diabetes, consider the challenges in their inability to execute proper physical activity and monitor appropriate nutrition, deliberate on the adults with very low socioeconomic status and low level of education, and adjust the health communication protocols to improve health responsibility among these population.

4. This study took advantage of the diabetes risk scoring assessments to derive diabetes risk status classification, and get away with the usual identification of sociodemographic risk factors alone, which by itself have limitations in identifying patients with limited health literacy. The measurement of waist circumference as an objective way of ascertaining diabetes level risk, in addition to self-reported measurements is a strength of this study. Furthermore, the advantage of utilizing a health literacy tool that comprehensively measures the health information competencies among three health dimensions, could be incorporated as part of the health and social history of the adults, making it as non-threatening and less association of shame with illiteracy, even for individuals who has no reading and writing capability.

5. The result of non-significant differences between the health promoting behaviors of adults at high and low risk for diabetes should not be misunderstood as a failure of the study, but instead a springboard for another study to scrutinize the characteristics of the adults that influences their health behaviors, whether they are classified as high risk or low risk for diabetes. Furthermore, in the rural setting, an all population-based inclusion should still be implemented when conducting health information campaigns, so as to reach the greater percentage of the adults who have lower levels of health literacy.

6. In this study, the significant difference between the health literacy of adults at high and low risk for diabetes, had practical implications, where prioritization of health education among those at high risk for diabetes should be in place, as the economy of practicing health information campaigns is always costly. However, the needs of those adults at low risk for diabetes should also not be overlooked, as the health promoting behaviors among adults at high and low risk for diabetes had no significant difference in this study.

7. Adults at high risk for diabetes, although having low health promoting behavior scores, their health behavior scores in spiritual growth, stress management, health responsibility and interpersonal relationships are better compared to their low risk for diabetes counterparts. Further study on the characteristics of adults at high risk for diabetes that makes them

have better scores in the aforementioned subscales of health promoting behavior, is recommended.

8. Disease prevention, being the subscale with the worst health literacy index for both adults at high and low risk for diabetes, should be a major concern in implementing health promotion projects. A greater number of adults showed to have very low health promoting behaviors in nutrition and physical actitivity, more so higher in adults at high risk for diabetes. Improving the health literacy of adults regarding where to find information on proper nutrition, practical cost-effective exercises and inclusion of family members in support of one's health responsibility is a target objective.

9. The significantly positive correlation between health literacy and health promoting behavior should be a calling for political will to push for government officials, legislators and stockholders to institutionalize programs that could increase health information competencies, such as making health information available in barangay health stations, through multimedia broadcast in TV advertisements, radio announcements and even free health information through text messaging, utilizing language appropriate, and "no read-no write" friendly pamphlets or leaflets. Furthermore, the local government unit is suggested to capitalize on pre-existing public education infrastructures to deliver health information among the locales, as remediation for the low health literacy, as well as a starting solution for disease prevention against diabetes.

References

Aaby, A., Friis, K., Christensen, B., Rowlands, G., & Maindal, H. (2017). Health literacy is associated with health behaviour and self-reported health: A large population-based study in individuals with cardiovascular disease. *European Journal Of Preventive Cardiology*, *24*(17), 1880-1888. doi: 10.1177/2047487317729538

Abdullah, A., Liew, S.M., Salim, H., Ng, C.J., Chinna, K. (2019) Prevalence of limited health literacy among patients with type 2 diabetes mellitus: A systematic review. PLoS ONE 14(5): e0216402. https://doi.org/10.1371/journal.pone.0216402

Abri, F., Atri, S., Sahebihagh, M., Jafarabadi, M., Behshid, M., & Ghasempour, M. (2018). The relationship between health literacy and stages of change in smoking behavior among employees of educational health centers of Tabriz University of Medical Sciences (2016). *International Journal Of Preventive Medicine*, *9*(1), 91. doi: 10.4103/ijpvm.ijpvm_259_17

Agosto, H. C., Briones, M. A., & Palatino, M. C. (2018). Correlates of health literacy among Filipinos aged 50-70 years old belonging to low-income families in a selected community. *Acta Medica Philippina, 52*(3), 2018th ser., 239-244.

Al Sayah, F., Majumdar, S.R., Egede, L.E. and Johnson, J.A. (2015). Associations between health literacy and health outcomes in a predominantly low-income African American population with type 2 diabetes, *Journal of Health Communication*, vol. 20, no. 5, pp. 581–588.

Bainsand, S.S., & Egede L.E., (2011). Associations between healthliteracy, diabetes knowledge, self-care behaviors, and glycemic control in a low income population with type 2 diabetes, *Diabetes Technology and Therapeutics*, vol. 13, no. 3, pp. 335–341.

Briones, M.V. (2017). Health Literacy Among Filipino Adults Belonging to Low-Income Families and its Association with Cancer Screening Utilization: A Cross-Sectional Study. 10.13140/RG.2.2.24282.90568.

Ammouri, A. (2008). Demographic differences in health promoting lifestyle in adult Jordanians. *Jordanian Medical Journal,* 42, 1-9.

Ao, X., Liu, M., Gan, Y., & Wang, H. (2014). Health literacy survey among permanent resident in Dating District Beijing. *Journal Of Hygiene Research*, *43*(1), 73-77.

Ball, D., Tiscki, K. (2009). Medicines price components in the Philippines. Available at: http://www.haiweb.org/ medicineprices/surveys/200807PHC/ sdocs/PriceComponentsReportPhilippines.pdf. Accessed August 10, 2015.

Baruch, Y. (1999). Response rate in academic studies - A comparative analysis. *Human Relations,* 52, 4, pp. 421-438.

Baruch, Y. and Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human relations,* 61, 8, pp. 1139-1160.

Beliran, S. & Legaspi, M (2014). Health promoting behaviors and quality of life of Filipino older persons. *Asia Pacific Journal of Education, Arts & Science.* 1(5): 11-20

Brady, B. & Nies, M.A. (1999). Health promoting lifestyles and exercises. A comparison of older African American above and below poverty level. *Journal of Holistic Nursing.,* 17 (2), 197-207.

Burns, N. & Grove, S. (2011). Understanding nursing research: Building an evidence-based practice (5th ed). Maryland Heights, MO: Elsevier Saunders.

Cabales, L., Fernando, M., & Obal, M. Barangay Vizcaya Population Profile 2018-2019, Barangay Vizcaya Population Profile 2018-20191–1 (2019).

Cajita, M.A., Denhaerynck, K., Dobbels, F., Berben, L., Russell, C.L., Davidson, P.M. (2017). Health literacy in heart transplantation: Prevalence, correlates and associations with health behaviors—Findings from the international BRIGHT study. J Heart Lung Transplant 2017;36(3):272-79. *The Journal of Heart and Lung Transplantation*, *36*(6), 700. doi: 10.1016/j.healun.2017.04.003

Can, G., Ozdilli, K., Erol, O., Unsar, S., Tulek, Z., Savaser, S. and Durna, Z. (2008) Comparison of the Health-Promoting Lifestyles of Nursing and Non-Nursing Students in Istanbul, Turkey. *Nursing & Health Sciences*, **10**, 273-280. http://dx.doi.org/10.1111/j.1442-2018.2008.00405.x

Castro et al (2017). Risk to develop Type 2 diabetes mellitus according to FINDRISC tool in Guatemalan physicians aged 40-60 years. *The Internaltional Journal of Medical Students,* 5 (1): 190-195.

Caylan, A., Yayla, K., Oztora, S., & Dagdeviren, H. (2018). Assessing health literacy, the factors affecting it and their relation to some health behaviors among adults. *Biomedical Research*, *28*(15), 6803-6807. Retrieved from http://www.biomedres.info

Centers for Disease Control and Prevention (2007). National Diabetes Fact Sheet. http://www.cdc.gov/diabetes/pubs/factsheet07.htm. Accessed September 18, 2016.

Chahardah-Cherik, S., Gheibizadeh, M., Jahani, S., & Bahman, C. (2017). The relationship between health literacy and health promoting behaviors in patients with Type 2 diabetes. *IJCBNM*, *6*(1), 65-75.

Chen, C.P., Peng, Y.S.H., Weng, H.H., Yen, H.H. and Chen, M.Y. (2013) Health-promoting behaviour is positively associated with diabetic control among Type 2 Diabetes Patients. *Open Journal of Nursing*, **3**, 274-280. http://dx.doi.org/10.4236/ojn.2013.32037

Chilton, L., Hu, J., & Wallace, D. C. (2006). Health-promoting lifestyle and diabetes knowledge in Hispanic American adults. Home Health Care Management & Practice, 18(5), 378-385. doi: 10.1177/1084822306288059

Choi, S., Rush, E., & Henry, S. (2012). Health Literacy in Korean Immigrants at Risk for Type 2 Diabetes. *Journal Of Immigrant And Minority Health*, *15*(3), 553-559. doi: 10.1007/s10903-012-9672-9

Chua, C. G. & Lim, A. (2009). Validation of diabetes risk assessment form (Draft) (Adapted From Findrisc) among undiagnosed DM 2 adults in Barangay. 212, Zone 19, District II, Manila: A Cross Sectional Analytical Study. *Unpublished Journal*. Retrieved October 15, 2016, from http://www.dpsys120991.com/Chua_poster_dmRisk.pdf

Cochran, W.G. (1977), Sampling Techniques, 3rd ed., John Wiley & Sons. p. 77

Coffman, M., Norton, C., & Beene, l. (2012). Diabetes symptoms, health literacy, and healthcare use in adult latinos with diabetes risk factors. *Journal Of Cultural Diversity*, *19*(1), 4-9.

Conserva, L. (2014, May 29). 1 of 5 Ilonggos suffers diabetes. *The Daily Guardian*. Retrieved October 02, 2016, from http://www.thedailyguardian.net/index.php/local-news/41653-1-of-5-ilonggos-suffers-diabetes-xx

Cooper, A.J., Forouhi, N.G., Ye, Z., Buijsse, B., Arriola, L., Balkau, B., Barricarte, A., Beulens, J.W., Boeing, H., Buchner, F.L., et al. (2012). Fruit and vegetable intake and type 2 diabetes: EPIC-InterAct prospective study and meta-analysis. *Eur J Clin Nutr*; 66:1082–92.

Coughlan, M., Cronin, P. & Ryan, F. (2007). Step-by-step guide to critiquing research. Part 1: Quantitative research. *British Journal of Nursing.* 16(11), 658, 663.

Daniel, W.W. (1990). "Kolmogorov–Smirnov one-sample test". Applied Nonparametric Statistics (2nd ed.). Boston: PWS-Kent. pp. 319–330. ISBN 978-0-534-91976-4.

Davey, J., Holden, C., & Smith, B. (2015). The correlates of chronic disease-related health literacy and its components among men: a systematic review. *BMC Public Health*, *15*(1). doi: 10.1186/s12889-015-1900-5

De Castro, S., Brito, G. and Gomes, M. (2014). Health literacy skills in type 2 diabetes mellitus outpatients from a university-affiliated hospital in Rio de Janeiro, Brazil. *Diabetology and Metabolic Syndrome*, 6, p.126.

Derrick, B., Ruck, A., Toher, D., White, P. (2018). "Tests for equality of variances between two samples which contain both paired observations and independent observations"(PDF). *Journal of Applied Quantitative Methods*. **13** (2): 36–47.

Droomers, Mariël & Westert, Gert. (2004). Do Lower Socioeconomic Groups Use More Health Services, Because They Suffer from More Illnesses?. European journal of public health. 14. 311-3. 10.1093/eurpub/14.3.311.

Duda-Krol et al (2016). FINDRISC scale as a common tool to assess the risk of diabetes type 2. *MEDtube Science,* 4(1): 8-10.

Dugee, et al (2015). Adapting existing diabetes risk scores for an Asian population: a risk score for detecting undiagnosed diabetes in Mongolian population, *BMC Public Health* 15 (938): 1-9.

Duong, T., Aringazina, A., Baisunova, G., Nurjanah, Pham, T., & Pham, K. et al. (2017). Measuring health literacy in Asia: Validation of the HLS-EU-Q47 survey tool in six Asian countries. *Journal Of Epidemiology*, *27*(2), 80-86. doi: 10.1016/j.je.2016.09.005

Duong, T., Chang, P., Yang, S., Chen, M., Chao, W., & Chen, T. et al. (2017). A New Comprehensive Short-form Health Literacy Survey Tool for Patients in General. *Asian Nursing Research*, *11*(1), 30-35. doi: 10.1016/j.anr.2017.02.001

Duong, T., Sørensen, K., Pelikan, J., Van den Broucke, S., Lin, I., & Lin, Y. et al. (2017). Health-related behaviors moderate the association between age and self-reported health literacy among Taiwanese women. *Women & Health*, *58*(6), 632-646. doi: 10.1080/03630242.2017.1333074

Duong, T., Aringazina, A., Kayupova, G., Pham, T., Pham, K., Truong, T., Nguyen, K., Oo, W., Su, T., Majid, H., Sørensen, K., Lin, I., Chang, Y., Yang, S., Chang, P.(2019). Development and Validation of a New Short-Form Health Literacy Instrument (HLS-SF12) for the General Public in Six Asian Countries. *HLRP: Health Literacy Research and Practice.* 3(2) e91-e102. doi: 10.3928/24748307-20190225-01

Employment status. (n.d.) *Mosby's Dental Dictionary, 2nd edition*. (2008). Retrieved October 23 2017 from https://medical-dictionary.thefreedictionary.com/employment

Eyu˙bog˙lu, E. and Schulz, P.J. (2016). “Do health literacy and patient empowerment affect self-care behaviour? A survey study among Turkish patients with diabetes,” *BMJ Open*, vol. 6, no. 3, Article ID e010186.

Family structure. (n.d.) *Mosby's Medical Dictionary, 8th edition*. (2009). Retrieved October 23 2017 from https://medical-dictionary.thefreedictionary.com/family+structure

Feldman, A. L., Long, G. H., Johansson, I., Weinehall, L., Fhärm, E., Wennberg, P., … Rolandsson, O. (2017). Change in lifestyle behaviors and diabetes risk: evidence from a population-based cohort study with 10-year follow-up. *The International Journal of Behavioral Nutrition and Physical Activity*, *14*, 39. http://doi.org/10.1186/s12966-017-0489-8.

Fleary, S., Joseph, P., & Pappagianopoulos, J. (2018). Adolescent health literacy and health behaviors: A systematic review. *Journal Of Adolescence*, *62*, 116-127. doi: 10.1016/j.adolescence.2017.11.010

Frie, K.G., Eikemo, T.A., & Knesebeck, O.V. (2009). Education and self-reported health care seeking behaviour in European welfare regimes: results from the European Social Survey. *International Journal of Public Health, 55*, 217-220.

Friis, K., Vind, B., Simmons, R., & Maindal, H. (2016). The Relationship between Health Literacy and Health Behaviour in People with Diabetes: A Danish Population-Based Study. *Journal Of Diabetes Research*, *2016*, 1-7. doi: 10.1155/2016/7823130

Fukuoka, Y., Choi, J., Bender, M.S., Gonzalez, P., & Arai, S. (2015) Family history and body mass index predict perceived risks of diabetes and heart attack among community-dwelling Caucasian, Filipino, Korean and Latino Americans, *Diabetes Res Clin Pract,* 109 (1), 157-63. doi: 10.1016/j.diabre.2015.04.015.

Fullam, J. (2012). *The European health literacy survey: results from Ireland.*

Gillies, C.L., Abrams, K.R., Lamber, P.C., Cooper, N.J., Sutton, A.J. Hsu, R.T. Khunti, K. (2007). Pharmacological and lifestyle interventions to prevent or delay type 2 diabetes in people with impaire glucose tolerance: a systematic review and meta-analysis. *BMJ,* pp 1-9. doi: 10.1136/bmj.39063.689375.55

Geboers, B., Brainard, J., Loke, Y., Jansen, C., Salter, C., Reijneveld, S., & de Winter, A. (2015). The association of health literacy with adherence in older adults, and its role in interventions: a systematic meta-review. *BMC Public Health*, *15*(1). doi: 10.1186/s12889-015-2251-y

Geboers, B., Reijneveld, S., Jansen, C., & de Winter, A. (2016). Health Literacy Is Associated With Health Behaviors and Social Factors Among Older Adults: Results from the LifeLines Cohort Study. *Journal Of Health Communication*, *21*(sup2), 45-53. doi: 10.1080/10810730.2016.1201174

Gefter, L., Morioka-Douglas, N., Srivastava, A., & Rodriguez, E. (2016). Supporting At-Risk Youth and Their Families to Manage and Prevent Diabetes: Developing a National Partnership of Medical Residency Programs and High Schools. *PLOS ONE*, *11*(7), e0158477. doi: 10.1371/journal.pone.0158477

Ghasemi, A., & Zahediasl, S. (2012). Normality tests for statistical analysis: a guide for non-statisticians. *International journal of endocrinology and metabolism*, *10*(2), 486–489. doi:10.5812/ijem.3505

Godino, J., van Sluijs, E., Marteau, T., Sutton, S., Sharp, S., & Griffin, S. (2016). Lifestyle Advice Combined with Personalized Estimates of Genetic or Phenotypic Risk of Type 2 Diabetes, and Objectively Measured Physical Activity: A Randomized Controlled Trial. *PLOS Medicine*, *13*(11), e1002185. doi: 10.1371/journal.pmed.1002185

Gordon, C., Walker, M., & Carrick-Sen, D. (2013). Exploring risk, prevention and educational approaches for the non-diabetic offspring of patients with type 2 diabetes - a qualitative study. *Journal Of Advanced Nursing*, *69*(12), 2726-2737. doi: 10.1111/jan.12162

Gutierrez, N., Kindratt, T., Pagels, P., Foster, B., & Gimpel, N. (2014). Health literacy, health information seeking behaviors and internet use among patients attending a private and public clinic in the same geographic area. *J Community Health, 39*(1), 83-9.

Guttman, L. (1945). A basis for analyzing test-retest reliability. Psychometrika, 10(4), 255–282.

Hacıhasanoğlu, R., Yıldırım, A., Karakurt, P. and Sağlam, R. (2011) Healthy Lifestyle Behaviour in University Stu- dents and Influential Factors in Eastern Turkey. *International Journal of Nursing Practice*, **17**, 43-51. http://dx.doi.org/10.1111/j.1440-172X.2010.01905.x

Hansen, H., Shneyderman, Y., & Belcastro, P. (2015). Investigating the Association of Health Literacy With Health Knowledge and Health Behavior Outcomes in a Sample of Urban Community College Undergraduates. *American Journal Of Health Education*, *46*(5), 274-282. doi: 10.1080/19325037.2015.1055016

Hedges, L.V. & Olkin, I. (1985). *Statistical Methods for Meta-Analysis*. Orlando: Academic Press. ISBN 978-0-12-336380-0.

Heikes K.E., Eddy, D.M., Arondekar, B., Schlessinger, L. (2008). Diabetes Risk Calculator: a simple tool for detecting undiagnosed diabetes and pre-diabetes*. Diabetes Care;* 31(5):1040-1045.

HLS-EU Consortium (2011): HLS-EU-Q47. The European Health Literacy Questionnaire matrix-related version with item numbers used in the European Health Literacy Survey 2011.

Howard, D., Sentell, T., & Gazmararian, J. (2006). Impact of health literacy on socioeconomic and racial differences in health in an elderly population. *J Gen Intern Med*, 21:857-861.

Hu, F.B., Manson, J.E., Stampfer, M.J., Colditz, G., Liu, S., Solomon, CG., Willett, W.C. (2001). Diet, lifestyle, and the risk of type 2 diabetes mellitus in women. *N Engl J Med*;345:790–7.

Hu, F,B,, Rimm, E., Smith-Warner, S,A. et al. (1999). Reproducibility and validity of dietary patterns assessed with a food-frequency questionnaire. *Am J Clin Nutr*; 69:243–249

InterAct Consortium, Ekelund, U., Palla, L., Brage, S, Franks, P.W., Peters, T., Balkau, B., Diaz, M.J., Huerta, J.M., Agnoli, C., et al. Physical activity reduces the risk of incident type 2 diabetes in general and in abdominally lean and obese men and women: the EPIC-InterAct Study. *Diabetologia*. 2012;55:1944–52.

IDF (2014) International Diabetes Federation. Global diabetes scorecard: Philippines, 2014. Available at: http://www.idf. org/global-diabetes-scorecard/assets/ downloads/Scorecard-29-07-14.pdf. Accessed October 12, 2016.

Ivanov, L., Wallace, D., Hernández, C., & Hyde, Y. (2015). Diabetes Risks and Health Literacy in Southern African American and Latino Women. *Journal Of Community Health Nursing*, *32*(1), 12-23. doi: 10.1080/07370016.2015.991664

Javadzade, S., Sharifirad, G., Radjati, F., Mostafavi, F., Reisi, M., & Hasanzade, A. (2012). Relationship between health literacy, health status, and healthy behaviors among older adults in Isfahan, Iran. *J Educ Health Promot*, 1:31.

Jordan, S., & Hoebel, J. (2015). Health literacy of adults in Germany - Findings from the ‘German Health Update', wave 2013–2014. *European Journal of Public Health*, *25*(suppl_3). doi: 10.1093/eurpub/ckv173.043

Kim, K., Kim, Y., & Choi, M. (2018). Association of Electronic Health Literacy With Health-Promoting Behaviors in Patients With Type 2 Diabetes. *CIN: Computers, Informatics, Nursing*, *36*(9), 438-447. doi: 10.1097/cin.0000000000000438

Kim S., Love F., Quistberg D.A., & Shea, J.A. (2004). Association of health literacy with self-management behavior in patients with diabetes," *Diabetes Care*, vol. 27, no. 12, pp. 2980–2982, 2004.

Kirsch, I., Jungeblut, A., Jenkins, L., & Kolstad, A. (1993). *Adult Literacy in America: A First Look at the Results of the National Adult Literacy Survey (NALS).* Washington, DC: National Center for Education Statistics.

Koppes, L.L., Dekker, J.M., Hendriks, H.F., Bouter, L.M., Heine, R.J. (2005). Moderate alcohol consumption lowers the risk of type 2 diabetes: a meta-analysis of prospective observational studies. *Diabetes Care*; 28:719–25.

Kowall, B., Rathmann, W., Stang, A., Bongaerts, B., Kuss, O., & Herder, C. et al. (2017). Perceived risk of diabetes seriously underestimates actual diabetes risk: The KORA FF4 study. *PLOS ONE*, *12*(1), e0171152. doi: 10.1371/journal.pone.017115

Ku, G. M., & Kegels, G. (2013). The performance of the Finnish Diabetes Risk Score, a modified Finnish Diabetes Risk Score and a simplified Finnish Diabetes Risk Score in community-based cross-sectional screening of undiagnosed type 2 diabetes in the Philippines. *Primary Care Diabetes, 7*(4), 249-259. doi:10.1016/j.pcd.2013.07.004

Lee, F. and Wang H. (2005). A Preliminary Study of a Health- Promoting Lifestyle Among Southeast Asian Women in Taiwan. *Kaohsiung Journal Medical Science*, 21: 114-20

Lee, R.L.,& Loke, A.J. (2005) Health promoting behaviors and psychosocial well being of university students in Hong Kong. *Public Health Nurs.* 22:209-220

Lehman, A. (2005). *Jmp For Basic Univariate And Multivariate Statistics: A Step-by-step Guide*. Cary, NC: SAS Press. p. 123. ISBN 978-1-59047-576-8.

Levene, H. (1960). "Robust tests for equality of variances". In Ingram Olkin; Harold Hotelling; et al. (eds.). *Contributions to Probability and Statistics: Essays in Honor of Harold Hotelling*. Stanford University Press. pp. 278–292.

Levin-Zamir, D., Baron-Epel, O., Cohen, V., & Elhayany, A. (2016). The Association of Health Literacy with Health Behavior, Socioeconomic Indicators, and Self-Assessed Health From a National Adult Survey in Israel. *Journal Of Health Communication*, *21*(sup2), 61-68. doi: 10.1080/10810730.2016.1207115

Lindemann, N. (2019). *What's the average survey response rate? [2019 benchmark]*. [online] Available at: https://surveyanyplace.com/average-survey-response-rate/ [Accessed 26 Nov. 2019].

Lindström, J & Tuomilehto, J. (2003) The diabetes risk score: a practical tool to predict type 2 diabetes risk. Diabetes Care; 26:725-31.

Lindström, J., Absetz, P., Hemiö, K., Peltomäki, P., Peltonen, M. (2010). Reducing the risk of type 2 diabetes with nutrition and physical activity - efficacy and implementation of lifestyle interventions in Finland. Public Health Nutr. Jun;13(6A):993-9.

Liu, Y., Liu, L., Li, Y., & Chen, Y. (2015). Relationship between Health Literacy, Health-Related Behaviors and Health Status: A Survey of Elderly Chinese. *International Journal Of Environmental Research And Public Health*, *12*(8), 9714-9725. doi: 10.3390/ijerph120809714

Maheri, A., Sadeghi, R., Shojaeizadeh, D. et al. (2016). Associations between a health- promoting lifestyle and quality of life among adults with beta-thalassemia major. *Epidemiology and Health*. 38:e2016050.

Mahdizadeh, M., & Solhi, M. (2018). Relationship between self-care behaviors and health literacy among elderly women in Iran, 2015. *Electronic Physician*, *10*(3), 6462-6469. doi: 10.19082/6462

Manila, et al., Dr. (2010). *Region VI Health Research Agenda 2005 – 2010* (pp. 1-36) Philippines, Regional Health Research and Development Committee (RHRDC), Region VI-Western Visayas. Iloilo, PH.

Mann, H.B. & Whitney, D.R. (1947). On a test of whether one or two random variables is stochastically larger than the other. *Annals of Mathematical Statistics* 18(1): 50-60.

Masconi, K. Matsha T, Erasmus R, & Kengn, A (2015). Recalibration in validation studies of diabetes risk prediction models: a systematic review. *International Journal of Statistics in Medical Research,* 4, 347-369

McCleary-Jones, V. (2011). Health literacy and its association with diabetes knowledge, self-efficacy and disease self-management among African Americans with diabetes mellitus. *The ABNF Journal*, vol. 22, no. 2, pp. 25–32,

McNaughton, C., Korman, R., Kabagambe, E., & Wright, S. (2015). Health literacy and blood glucose among Guyanese emergency department patients without diagnosed diabetes: a cross-sectional study. *Diabetology & Metabolic Syndrome*, *7*(1). doi: 10.1186/s13098-015-0028-1

Michael, O., Rotimi, O., Sandra, I. (2017). The performance of Finnish Diabetes Risk Score Questionnaire for screening individuals with undiagnosed type 2 diabetes and dysglycemia in Nigeria. *British Journal of Medicine and Medical Research,*19(5):1-8.

Ministry of Health. (2010). *Korero Marama: Health Literacy and Maori: Results from the 2006 Adult Literacy and Life Skills Survey.* Wellington.

Mohsenipoua, H., Majlessi, F., Shojaeizadeh, D., et al. (2016). Predictor of health-promoting behaviors in coronary artery bypass surgery patients: an application of Pender's Health Promotion Model. *Iran Red Crescent Med J*.;18:e38871

Nakayama, K., Osaka, W., Togari, T., Ishikawa, H., Yonekura, Y., Sekido, A., & Matsumoto, M. (2015). Comprehensive health literacy in Japan is lower than in Europe: a validated Japanese-language assessment of health literacy. *BMC Public Health*, 15:505.

Neatrour, G., Graves, A., & Aloi, J. (2014). Using a risk assessment questionnaire to identify prediabetics and diabetics in Tandag, Philippines. *Journal of Emerging Investigator,* 1-7

Niknami, M., Mirbalouchzehi, A., Zareban, I., Kalkalinia, E., Rikhtgarha, G., & Hosseinzadeh, H. (2018). Association of health literacy with type 2 diabetes mellitus self-management and clinical outcomes within the primary care setting of Iran. *Australian Journal Of Primary Health*, *24*(2), 162. doi: 10.1071/py17064

NNHS (2013). 8th National Nutrition Survey. National Nutrition and Health Survey. Retrieved from http://202.90.141.88/NNS/8thNNS.pdf on September 19, 2016.

OECD-Organization for Economic Cooperation and Development (2017). Definition of Age. Accessed from https://stats.oecd.org/glossary/detail.asp?ID=57 on October 19, 2017.

Oliver-McNeil, S. & Artinian, N. (2002). Women's perception of personal cardiovascular risk and their risk-reducing behaviors. *American Journal of Critical Care,* 11: 221-227.

Oztuna, D., Elhan A.H., Tuccar, E. (2006). Investigation of four different normality tests in terms of type 1 error rate and power under different distributions. Turkish Journal of Medical Science. 36(3):171–6

Paz-Pacheco, E., & Jimeno, C. (2015). Diabetes Care in the Philippines. *Journal Of The ASEAN Federation Of Endocrine Societies,* 30(2), 118-123. doi:10.15605/jafes.030.02.17

Pastakia, et al (2013). Screening for diabetes and hypertension in a rural low income setting in western Kenya utilizing home-based and community-based strategies. *Globalization & Health, 9:21.*

Patel, P. & Macerollo, A. (2010). Diabetes Mellitus: Diagnosis & Screening. *American Family Physician.* 81:7-863-870.

Pender, N.J., Murdaugh, C.L., & Parsons, M.A. (2006). Health Promotion in Nursing Practice (4th ed.). Englewood Cliffs, NJ: Prentice Hall.

Pender, N. (2009). The Health Promotion Model. *The University of Michigan School of Nursing The Health Promotion Model.* Accessed from www.nursing.umich.edu/faculty/pender/chart.gif on October 19, 2017.

Pender, N.J. (1996). Health promotion in nursing practice (3rd ed.). Stamford, CT: Appleton & Lange.

Philippine Commission on Audit (2015). A citizen participatory audit report. CPA Report No. 2015-01E. Accessed from https://www.coa.gov.ph/index.php/reports/citizen-participatory-audit-reports/category/6564-cpa-fmr on October 19, 2017.

Pilar, P. (2018). *2017 Health Situation of the Municipality of Pres. Roxas*. President Roxas, Capiz.

Polit, D.F., & Beck, C.T. (2014). *Essentials of nursing research: Appraising evidence for nursing practice*. Philadelphia: Wolters Kluwer Health /Lippincott Williams & Wilkins.

Philippine Statistics Authority. (2018). *PSA Grants Clearance to the National Health Literacy Survey*. Retrieved from https://psa.gov.ph/content/psa-grants-clearance-national-health-literacy-survey

President Roxas, Capiz Ecological Profile (2013). Accessed from https://www.scribd.com/document/317658941/Pres-Roxas-Culture-Profile on December 03. 2018.

Qureshi, R. N., Sheikh, S., Khowaja, A. R., Hoodbhoy, Z., Zaidi, S., Sawchuck, D., … CLIP Working Group (2016). Health care seeking behaviours in pregnancy in rural Sindh, Pakistan: a qualitative study. *Reproductive health*, *13 Suppl 1*(Suppl 1), 34. doi:10.1186/s12978-016-0140-1

Salinero-Fort, M.A., Burgos-Lunar, C., Lahoz, C., Mostaza, J.M., Abánades-Herranz, J.C., Laguna-Cuesta, F., Gómez-Campelo, P. (2016). Performance of the Finnish Diabetes Risk Score and a Simplified Finnish Diabetes Risk Score in a Community Based, Cross-Sectional Programme for Screening of Undiagnosed Type 2 Diabetes Mellitus and Dysglycaemia in Madrid, Spain: The SPREDIA-2 Study. *PLOS ONE PLoS ONE, 11*(7). doi:10.1371/journal.pone.0158489

Saaristo, T., Peltonenm, M., Lindstrom, J., Saarikoski, L., Sundvall, J., Erikson, J.G. et al. (2005). Cross sectional evaluation of the Finnish Diabetes Risk Score: a tool to identify undetected type 2 diabetes, abnormal glucose tolerance and metabolic syndrome. *Diabetes & Vascular Diease Research,* 2: 67-72.

Schillinger, Dean & Grumbach, Kevin & Piette, John & Wang, Frances & Osmond, Dennis & Daher, Carolyn & Palacios, Jorge & Sullivan, Gabriela & Bindman, Andrew. (2002). Association of health literacy with diabetes outcomes. JAMA : the journal of the American Medical Association. 288. 475-82.

Schwarz et al (2009). The Finnish Diabetes Risk Score is associated with insulin resistance and progression towards type 2 diabetes. *J Clin Endocrinol Metab,* 94(3): 920-926.

Shaheen, A., Nassar, O., Amre, H., & Hamdan Mansour, A. (2015). Factors affecting health promoting behaviors of university students in Jordan. *Health,* (7) 1-8 http://dx.doi.org/10.4236/helath.2015.71001

Shin, K., & Lee, E. (2018). Relationships of health literacy to self-care behaviors in people with diabetes aged 60 and above: Empowerment as a mediator. *Journal Of Advanced Nursing*, *74*(10), 2363-2372. doi: 10.1111/jan.13738

Siri, S.R. (2014). Difference in FINDRISC score for prediciting type 2 diabetes mellitus among Sami and Non-Sami, the SAMINOR 1 study. *The Arctic University of Norway, pp 1-62.*

Singapore Government (2013). Definition of monthly income. Accessed from http://stats.mom.gov.sg/SL/Pages/Gross-Monthly-Income-from-Work-Concepts-and-Definitions.aspx on October 19, 2017.

Son, Y., Kim, S., Kim, G., & Son, H. (2017). Associations between Health Literacy, Cancer-Related Knowledge, and Preventive Health Behaviors in Community-Dwelling Korean Adults. *Journal Of Health Communication*, *22*(12), 999-1006. doi: 10.1080/10810730.2017.1401687

Sorensen, K et. al (2011). Health literacy and public health: A systematic review and integration of definitions and models, BMC Public Health, 12 (80).

Sorour, A.S., Kamel, W.W., Abd El-Aziz, E.M., Aboelseoud, A. (2014). Health promoting lifestyle behaviors and related risk factors among female employees in Zagazig city. *Journal of Nursing Education and Practice* 4(5): 42-51

Souza, J., Apolinario, D., Magaldi, R., Busse, A., Campora, F., & Jacob-Filho, W. (2014). Functional health literacy and glycaemic control in older adults with type 2 diabetes: a cross-sectional study. *BMJ Open*, *4*(2), e004180. doi: 10.1136/bmjopen-2013-004180

Steinskog, D.J. (2007) A cautionary note on the use of the Kolmogorov-Smirnov test for normality. American Meteor Soc 135:1151–7.

Suka, M., Odajima, T., Okamoto, M., Sumitani, M., Igarashi, A., & Ishikawa, H. et al. (2015). Relationship between health literacy, health information access, health behavior, and health status in Japanese people. *Patient Education And Counseling*, *98*(5), 660-668. doi: 10.1016/j.pec.2015.02.013

Sun, X., Shi, Y., Zeng, Q., Wang, Y., Du, W., & Wei, N. et al. (2013). Determinants of health literacy and health behavior regarding infectious respiratory diseases: a pathway model. *BMC Public Health*, *13*(1), 1-8. doi: 10.1186/1471-2458-13-261

Sutherland, L.L, Weiler D.M, Bond, L. Simonson, S. & Reis, J. (2012). Northwestern Latinos' health promotion lifestyle profiles according to diabetes risk status. *J Immigr Minor Health,* 14(6): 999-10005. doi: 10.1007/s10903-012-9641-3

Tabaei et al (2003). Community-Based Screening for Diabetes in Michigan. *Diabetes Care,* 26 (3): 668-670.

Tavakol, M. and Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, pp.53-55.

Thode, H.J. (2002). Testing for normality. New York: Marcel Dekker

Tol, A., Mohebbi, B., Sadeghi, R., Maheri, A.B., & Eshraghian, M.R. (2014). Determinants of Health Promoting Behaviors among Type 2 Diabetic Patients: Voice of Iran. *Open Journal of Endocrine and Metabolic Diseases* 4, 219-224

Tol, A., Pourreza, A., Tavasoli, E. and Rahimi, A. (2012). Determination of knowledge and health literacy among women with type 2 diabetes in teaching hospitals of TUMS. *Journal of Hospital*, 11, pp.45-52.

Tsai, H., Cheng, C., Chang, S., Yang, Y., & Wang, H. (2014). Health Literacy and Health-Promoting Behaviors among Multiethnic Groups of Women in Taiwan. *Journal Of Obstetric, Gynecologic & Neonatal Nursing*, *43*(1), 117-129. doi: 10.1111/1552-6909.12269

Vandenbosch, J., Van den Broucke, S., Schinckus, L., Schwarz, P., Doyle, G., & Pelikan, J. et al. (2018). The impact of health literacy on diabetes self-management education. *Health Education Journal*, *77*(3), 349-362. doi: 10.1177/0017896917751554

Van der Heide, I., Wang, J., Droomers, M., Spreeuwenberg, P., Rademakers, J., & Uiters, E. (2013). The relationship between health, education, and health literacy: results from the Dutch Adult Literacy and Life Skills Survey. *Journal of health communication*, *18 Suppl 1*(Suppl 1), 172–184. doi:10.1080/10810730.2013.825668

Von Goeler et al (2003). Self-management of type 2 diabetes: A survey of low income urban Puerto Ricans. *The Diabetes Educator,* 29 (4), 663-672

Wagner, C., Knight, K., Steptoe, A., & Wardle, J. (2007). Functional health literacy and health-promoting behaviour in a national sample of British adults. *Journal Of Epidemiology & Community Health*, *61*(12), 1086-1090. doi: 10.1136/jech.2006.053967

Walker, S.N., Sechrist, K.R., Pender, N.J. (1995). Health Promotion Model-Instruments to Measure Health Promoting Lifestyle: Health Promoting Lifestyle Profile (HPLP II) Adult Version. Accessed from http://hdl.handle.net/2027.42/85349 on October 22, 2017.

Walker, S.N., & Hill-Polerecky, D.M. (1996). *Psychometric evaluation of the Health-Promoting Lifestyle Profile II*. Unpublished manuscript, University of Nebraska Medical Center.

Wang, R., Hsu, H., Lee, Y., Shin, S., Lin, K., & An, L. (2016). Patient empowerment interacts with health literacy to associate with subsequent self-management behaviors in patients with type 2 diabetes: A prospective study in Taiwan. *Patient Education And Counseling*, *99*(10), 1626-1631. doi: 10.1016/j.pec.2016.04.001

Wei, C., Harada, K., Ueda, K., Fukomoto, K., Minamoto, K. & Ueda, A. (2012) Assessment of health promoting lifestyle profile in Japanese university students. *Environ Health Prev Med* 17: 222-227. doi: 10.1007/s12199-011-0244-8

Wen, L.K., Shepher, M.D., & Parchman, M.L. (2004) Family support, diet, and exercise among older Mexican Americans with Type 2 diabetes. *The Diabetes Educator,* 30(6), 980-993.

Wessa, P., (2017), Pearson Correlation (v1.0.13) in Free Statistics Software (v1.2.1), Office for Research Development and Education, URL https://www.wessa.net/rwasp_correlation.wasp/

WHO (2006). Definition of sex. Accessed from http://www.who.int/reproductivehealth/topics/sexual_health/sh_definitions/en/ on October 19, 2017

Wilk, M.B.; Gnanadesikan, R. (1968), "Probability plotting methods for the analysis of data", *Biometrika*, Biometrika Trust, 55 (1): 1-17, doi:10.1093/biomet/55.1.1, JSTOR 2334448, PMID 566104

Willi, C., Bodenmann, P., Ghali, W.A., Faris, P.D., Cornuz, J. (2010). Active smoking and the risk of type 2 diabetes: a systematic review and meta-analysis. *JAMA*.;298:2654–64.

Wilson, et al. (2010) The effectiveness and efficiency of diabetes screening in Ontario, Canada: a population-based cohort study. *BMC Public Health* 10:506.

Wong, K., Velasquez, A. and Powe, N. (2017). The Relationship Between Health Literacy and Self-Care Behaviors Among Diverse Patients with Chronic Kidney Disease. *American Journal of Kidney Diseases*, 69(4), p.A103.

Yeh, J., Wei, C., Weng, S., Tsai, C., Shih, J., Shih, C., & Chiu, C. (2018). Disease-specific health literacy, disease knowledge, and adherence behavior among patients with type 2 diabetes in Taiwan. *BMC Public Health*, *18*(1). doi: 10.1186/s12889-018-5972-x

Zhang, L., Zhang, Z., Zhang, Y., Hu, G., & Chen, L. (2014). Evaluation of Finnish Diabetes Risk Score in Screening Undiagnosed Diabetes and Prediabetes among U.S. Adults by Gender and Race: NHANES 1999-2010. *PLoS ONE,* *9*(5). doi:10.1371/journal.pone.0

APPENDIX A

Ethics Review Board Form

UNIVERSITY OF THE PHILIPPINES
OPEN UNIVERSITY

Office of the Vice Chancellor for Academic Affairs

11 March 2019

ASST. PROF. QUEENIE RIDULME
Program Chair
Master of Arts in Nursing
Faulty of Management and Development Studies
UP Open University
Los Baños, Laguna

Dear Asst. Prof. Ridulme:

The UPOU Research and Publications Committee as per the endorsement of Ms. Ma. Cecilia Punzalan and Dr. Josephine Agapito who served as Ethical Reviewers for the thesis proposal of one UPOU Master of Arts in Nursing student whose name is indicated below is recommending the following action:

> **Christian Sandor Badana Ydirin:** "Health Promoting Behaviors and Health Literacy among Adults at Risk for Diabetes in a Rural Setting"
>
> **ACTION:** Passed the ethical review and can proceed with her research but have to revise according to the comments made by the reviewers

May we request you to disseminate the said information to the concerned student.

Thank you.

Truly yours,

MELINDA F. LUMANTA
Vice Chancellor and
Chair, Research and Publications Committee

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UP OPEN UNIVERSITY
APPLICATION FOR ETHICAL REVIEW
ERB/RPC EVALUATION FORM **Appendix C**

Research/Project Title:	Health Promoting Behaviors and Health Literacy among Adults at Risk for Diabetes in a Rural Setting
Faculty of Studies/Office:	MAN – FMDS
Researcher/Proponent:	Christian Sandor Badana Ydirin

Checklist of Required Documents	**Compliance**	
	Yes	**No**
Application for Ethical Review (Appendix A)	/	
Research proposal/protocol	/	
Research investigator/proponent's curriculum vitae	/	
Official Letter of Endorsement	/	

UP OPEN UNIVERSITY
APPLICATION FOR ETHICAL REVIEW
ERB/RPC EVALUATION FORM **Appendix C**

Evaluation Criteria	Compliance		Remarks
	Yes	No	
Compliance with protocol			The title reflected the objectives of the study. Research objectives were properly stated. Review of literature needs to be enhanced particularly on local studies about diabetes. Research Design is appropriate. Sampling Design is not well explained although simple random sampling is mentioned, the data or records where the samples will be drawn was not specified. Discuss the details of sampling procedures. The age range is from 18-79 years. Once the participant reach age 60, or beyond senior citizen, the requirement. for ethics become more stringent. It is suggested to make the age range 18-59 years old. There is a need to modify inclusion and exclusion criteria for this suggestion. It is suggested to specify who will conduct or do the verbatim interview. Statistical Analysis is well explained.
Informed consent			Significance of the study was mentioned under benefits, a statement that there will be no direct benefits such as specific token for the individual participant need to be provided in the ICF. It is suggested that a token be provided to the participants for spending 30 minutes of their time. The conduct of the informed consent process need to be explained including where and who will conduct it, is it the researcher or a trained personnel?

Openness and integrity			Confidentiality is mentioned but detailed data management procedures such as duration of storage as well as disposal of data need to be stated. Modify the statement that that the participant can stop or withdraw by adding " at anytime" during the conduct of the study. Provide specific procedure in the conduct of interview as to where it will be held. Will the interviewer go to the house of the participant or the participant will go to a specific place for the interview. This part was not explicit in the protocol. Statement on post study access need to be provided in the ethical consideration section and ICF This means that participant can have access to the result of the study if they asked for it.
Protection from harm			Statement that the study has minimal risk need to be provided in the ethical consideration section an the protocol.
Confidentiality			Include a statement that their individual identities will not be revealed as the results will be analyzed as a group. Statement that the study will comply with the Data Privacy Act of 2012 need to be provided. The contact details of the principal investigator as well as the Name of the Ethics Review Committee panel chair need to be included in the ICF.
Professional codes of practice and ethics			Check spelling (association page 14) , (preferences page 18)

UP OPEN UNIVERSITY
APPLICATION FOR ETHICAL REVIEW
ERB/RPC EVALUATION FORM **Appendix C**

Kindly check your decision on the proposal

☑ Approval: Passed the ethical review and can proceed with his/her research but have to revise according to the comments made by the reviewer.

☐ Approval without revision.

☐ Disapproval: Disapprove comply first with the suggestions given. Ethical Considerations should be part of the protocol.

Reviewer:

Josephine D. Agapito	March 10, 2019
Print Name & Signature	Date

APPENDIX B

Research Instrument

PARTICIPANT ID NO.: _____ INTERVIEWER ID NO. _____ ZONE NO.: _____ 2

IKA-ISA NGA PARTE (PART 1)

PAHANUDLO: Palihog sabat sang mga ginapangayo nga impormasyon. Tanan nga impormasyon nga imo igahatag masaligan mo nga pagataguon kag konpidensyal.

Markahan sang tsek (✔) ang kwadrado (*square)* sang imo sabat.

1) Edad:
   - □ 18-44
   - □ 45-54
   - □ 55 pataas

2) Sekso:
   - □ Lalaki
   - □ Babayi

3) Estado nga sibil:
   - □ Kasal o *lived in*
   - □ Wala asawa
   - □ Balo
   - □ Separado

4) Lebel sang edukasyon:
   - □ Wala ka eskwela
   - □ Elementarya
   - □ Hayskul
   - □ Bokasyonal
   - □ Kolehiyo

5) Estado sang trabaho:
   - □ May trabaho
   - □ Wala trabaho

6) Estado sang ika-ayong lawas*:*
   - □ May balatian
   - □ Wala balatian

7) Panseguro para sa ika-ayong lawas (*PhilHealth) o iba pa nga Health insurance):*
   - □ May ara
   - □ Wala

8) Istraktura sang pamilya:
   - □ Tatay/Nanay kag may mga bata.
   - □ Tatay/Nanay kag mga bata, lakip ang mga iban nga kapamilya.
   - □ Mag-asawa pero wala bata.
   - □ Isahanon.

9) Binulan nga kita:
   - □ Manubo 5,000 pesos
   - □ 5,001-9,999 pesos
   - □ Sobra 10,000 pesos

10) Beses sang pagkonsulta sa doktor sa sulod sang isa ka tuig:
   - □ Wala
   - □ 1-3 beses
   - □ 4-6 beses
   - □ 7 beses ukon sobra pa

11) Nahambalan bala ikaw nga mataas ang imo presyon sang dugo (*blood pressure*) sang magpakonsulta ikaw sa doktor?
   - □ Oo
   - □ Wala

12) May ara ka bala miyembro sang pamilya o paryente nga may dyabetes?
   - □ Wala
   - □ Oo: lolo/lola, tiya o tiyo ukon pakaisa
   - □ Oo: ginhikanan, utod ukon bata

13) Nahambalan bala ikaw nga mataas ang imo kalamay sa dugo (*blood sugar*) sang magpakonsulta ka sa doktor?
   - □ Oo
   - □ Wala

14) Takus o sukat sang hawak (cm): _____

PARTICIPANT ID NO.: _____ INTERVIEWER ID NO. _____ ZONE NO.: _____ 3

IKA-DUWA NGA PARTE (PART 2)

PAHANUDLO: Ang ini nga kwestiyonaryo nagalakip sing mga pahayag nahanungod sa subung mo nga pagginawi sa kabuhi ukon personal mo nga mga buluhaton. Palihog hatag sing kompleto nga mga pahayag kag husto. Isulat ang tsek (✔) sa sulod sang kahon kun pila ka beses mo ginabuhat ang kada pahayag para sa ika-ayong lawas. Akon pagabasahon sa imo ang tagsa ka pamangkot, lakip na ang mga pilian mo nga mga sabat.

Mga Pamangkot		Sabat			
		1	**2**	**3**	**4**
1	Ginapakigbahin ko ang akon mga problema kag kabalakhan sa mga tawo nga malapit sa akon.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
2	Ginapili ko ang mga pagkaun nga manubo sa tambok ukon kolesterol.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
3	Ginareport ko sa doktor ang mga di-maayo ko nga mga sintomas o senyales nga ginabatyag sang akon lawas.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
4	Ginatuman ko ang planado nga programa para sa pag-ehersisyo.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
5	Nagatulog sing husto.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
6	Nabatyagan ko ang pagtubo kag pagbag-o sa positibo nga pama-agi.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
7	Ginadayaw ko ang mga binuhatan sang iban nga mga tawo.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
8	Gina-limitahan ko ang pag-usar sang kalamay ukon mga kalan-un nga matam-is.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
9	Nagabasa ukon nagatan-aw sing mga programa sa TV para sa pagpasanyug sang ika-ayong lawas.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
10	Naga-ehersisyo sa sulod sang 20 ka minuto kag sobra pa, 3 ka beses sa isa ka semana (paglakat, pagbisikleta, pagsaot, pagsaka sa hagdan).	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
11	Ginahatagan ko sang tinion ang akon kaugalingon sa pag-relaks kada adlaw.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
12	May pagpati nga may tinutuyo ang akon kabuhi.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
13	Ginapadayun ko ang makahulugan kag mapinuslanon nga pagpakig-relasyon sa iban.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
14	Nagakaon ako sing 6-11 ka piraso sang tinapay, butil, kan-on kag pasta kada adlaw.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
15	Nagapamangkot ako sa mga propesyonal para sa ika-ayung lawas agud mahangpan ko ang mga ginatudlo.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
16	Nagapartisipar ako sa mga mamag-an tubtob sa medyo mabug-at nga mga pisikal nga aktibidades (kaangay sang paglakat sa sulod sang 30-40 ka minuto, lima ka beses ukon sobra pa kada semana).	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*

PARTICIPANT ID NO.: _____ INTERVIEWER ID NO. _____ ZONE NO.: _____ 4

Mga Pamangkot		Sabat			
		1	2	3	4
17	Ginabaton ko ang mga pagkahanabu sa kabuhi ko nga indi ko na sarang pa nga mabag-o.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
18	Maayo ang pagtan-aw ko sa palaabuton.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
19	Nagahatag ako sing tinion sa pagpakig-upod sa akon mga abyan.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
20	Nagakaun 2-4 ka klase sang prutas kada adlaw.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
21	Nagakuha ako sing ikaduha nga *opinion* kung nagapangduha-duha ako sa paggiya sang akon doktor ukon iban pa nga mga propesyonal para sa ika-ayong lawas.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
22	Nagapartisipar sa mga kalingawan ukon pisikal nga mga buluhaton (paglangoy, pagsaot, pagbisikleta).	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
23	Nagakonsentrar sa mga maayo nga panumduman bag-o matulog.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
24	Kontento kag may paghidaet sa akon kaugalingon.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
25	Ginapakita ko ang pagkabalaka, kainit, kag paghigugma para sa iban.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
26	Nagakaun 3-5 ka klase sang utan kada adlaw.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
27	Ginapakigbahin ko ang akon mga kabalakhan para sa ika-ayong lawas sa mga doktor kag iban pa nga mga propesyonal sa ika-ayong lawas.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
28	Ginabuhat ko ang pag-ehersisyo para sa pag-unat sing lawas tatlo ka beses sa isa ka semana.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
29	Naga-usar sing mga metodo ukon mga pamaagi para makontrol ang kakapuy.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
30	Naga-obra agud matuman ko ang mga malawig nga tinutuyo sang akon kabuhi.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
31	Nagatandog kag gintandog sang mga tawo nga gina-ulikdan ko.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
32	Nagakaun 2-3 ka baso sang gatas ukon piraso sang keso kada adlaw.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
33	Gina-inspeksyon ko ang akon lawas kada bulan para sa pisikal nga pagbag-o ukon mga delikado nga senyales.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
34	Sa masami nga mga pang-adlaw-adlaw nga mga buluhaton, naga-ehersisyo ako (kaangay sang paglakat tapos kaun, pag-usar sing hagdanan).	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
35	Ginabalanse ang oras sa pag-obra kag paghampang.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
36	Nakit-an ko nga mapanghangkat kag interasado ang kada maabot nga adlaw.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
37	Nagapangita sing paagi agud makuha ang pag-kinahangla-nun ko para sa personal nga relasyon.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*

Mga Pamangkot		Sabat			
		1	2	3	4
38	Nagakaun 2-3 ka piraso sang karne, manok, isda, legumbre, itlog kag mani kada adlaw.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
39	Nagapamangkot sang impormasyon gikan sa mga propesyonal para sa ika-ayung lawas nahanungod sa mga pamaagi sa pag-alaga sang akon kaugalingon.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
40	Gina-tsek ukon gina-isip ko ang akon pulso kun mag-ehersiyo.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
41	Nagapraktis ako sa pagrelaks ukon meditasyon sa sulod sang 15-20 ka minuto kada adlaw.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
42	Nakahibalo ako kun ano ang importante sa akun kabuhi.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
43	Nagakuha ako sing suporta halin sa grupo sang mga naga-alaga nga mga tawo.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
44	Ginabasa ang mga *label* sang pagkaun para mahibaluan ang mga kantidad sang sustansiya, tambok, kag asin.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
45	Naga-tambong sa mga programang pang-edukasyon para sa personal nga ika-ayung lawas.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
46	Ginalab-ot ko ang *target* nga pagpitik sang tagipusuon kun naga-ehersisyo.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
47	Nagahimu ako sing pamaagi para malikawan ang pagkakapoy.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
48	Nagabatyag nga may koneksiyon ako sa puwersa nga mas labaw pa sang sa akun kaugalingon.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
49	Ginahusay ang hindi paghangpanay sa iban paagi sa pag-diskusyon kag kompromiso.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
50	Nagapamahaw sa aga.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
51	Nagapangita sing paggiya ukon “counseling” kun kinahanglan.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*
52	Ginabutang ko ang akon kaugalingon sa mga bag-o nga mga eksperyensya kag paghangkat.	*Wala gid*	*Talagsa*	*Pirmi*	*Pirmi-pirmi gid*

PARTICIPANT ID NO.: _____ INTERVIEWER ID NO. _____ ZONE NO.: _____ 6

IKA-TATLO NGA PARTE (PART 3)

PANUNTUNIN: Ang parte pong ito ang susukat ng inyong health literacy sa pamamagitan ng pagsagot sa 12 katanungan. Maaari lamang po na sagutin nang tapat at totoo ang mga sumusunod na katanungan. Wala pong tama o maling sagot. Sa scale mula sa napakadali hanggang sa napakahirap, gaano kadali para sa iyo na:

Mga Pamangkot		Sabat			
		1	2	3	4
1	...humanap ng impormasyon ukol sa sintomas ng sakit na ikinababahala mo?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
2	...maintindihan ang leaflets na kasama ng inyong gamot?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
3	...husgahan ang mga bentahe at disbentahe ng iba't ibang paraan ng paggagamot?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
4	...tumawag ng ambulansya kapag may emergency?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
5	...humanap ng impormasyon kung paano i-manage ang mga problema sa pag-iisip tulad ng stress at depresyon?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
6	... maintindihan kung bakit ninyo kailangan ng mga health screening (tulad ng breast exam sa mga babae/ prostate exam sa mga lalake, blood sugar test, at blood pressure)?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
7	...husgahan kung anong mga bakuna ang inyong kailangan?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
8	...magdesisyon kung paano ninyo mapoprotektahan ang inyong sarili base sa payo ng inyong mga kamag- anak o mga kaibigan?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
9	...alamin ang tungkol sa mga gawain (tulad ng meditasyon, ehersisyo, paglalakad, pilates, at iba pa) na nakakabuti sa iyong pag-iisip?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
10	...maintindihan ang mga impormasyon na ipinapikita sa media (tulad ng internet, diyaryo, magasin) kung paano maging mas malusog?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
11	...husgahan kung alin sa mga araw-araw ninyong gawain (tulad ng pag-inom, pagkain, ehersisyo, at iba pa ang kaugnay sa iyong kalusugan?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*
12	...sumali sa mga sports club o exercise class kung gugustuhin ninyo?	*Napakahirap*	*Mahirap*	*Madali*	*Napakadali*

APPENDIX C

Simplified FINDRISC Questionnaire

Appendix C. The Simplified Finnish Diabetes Risk Score

		Alternatives		Score	Write score
1.	Age	Under 45 years		0	
		45–54 years		2	
		55–64 years		3	
		Over 64 years		4	
2.	Waist circumference	**Male**	**Female**		
		Less than 90 cm	Less than 80 cm	0	
		90–102 cm	80–88 cm	3	
		More than 102 cm	More than 88 cm	4	
3.	Have you ever been diagnosed or told by your health care provider that you have hypertension?	No		0	
		Yes		2	
4.	Have you ever been found to have high blood sugar?	No		0	
		Yes		5	
5.	Have any of your relatives been diagnosed with diabetes (type 1 or type 2)?	No		0	
		Yes: grandparent, aunt, uncle, or first cousin		3	
		Yes: parent, brother, sister, or own child		5	
	Total score				

APPENDIX D

Health Promoting Lifestyle Profile II Questionnaire

English Version

LIFESTYLE PROFILE II

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling:

N for never, **S** for sometimes, **O** for often, or **R** for routinely

		NEVER	SOMETIMES	OFTEN	ROUTINELY
1.	Discuss my problems and concerns with people close to me.	N	S	O	R
2.	Choose a diet low in fat, saturated fat, and cholesterol.	N	S	O	R
3.	Report any unusual signs or symptoms to a physician or other health professional.	N	S	O	R
4.	Follow a planned exercise program.	N	S	O	R
5.	Get enough sleep.	N	S	O	R
6.	Feel I am growing and changing in positive ways.	N	S	O	R
7.	Praise other people easily for their achievements.	N	S	O	R
8.	Limit use of sugars and food containing sugar (sweets).	N	S	O	R
9.	Read or watch TV programs about improving health.	N	S	O	R
10.	Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).	N	S	O	R
11.	Take some time for relaxation each day.	N	S	O	R
12.	Believe that my life has purpose.	N	S	O	R
13.	Maintain meaningful and fulfilling relationships with others.	N	S	O	R
14.	Eat 6-11 servings of bread, cereal, rice and pasta each day.	N	S	O	R
15.	Question health professionals in order to understand their instructions.	N	S	O	R
16.	Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).	N	S	O	R
17.	Accept those things in my life which I can not change.	N	S	O	R
18.	Look forward to the future.	N	S	O	R
19.	Spend time with close friends.	N	S	O	R
20.	Eat 2-4 servings of fruit each day.	N	S	O	R
21.	Get a second opinion when I question my health care provider's advice.	N	S	O	R
22.	Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).	N	S	O	R
23.	Concentrate on pleasant thoughts at bedtime.	N	S	O	R
24.	Feel content and at peace with myself.	N	S	O	R
25.	Find it easy to show concern, love and warmth to others.	N	S	O	R

	NEVER	SOMETIMES	OFTEN	ROUTINELY
26. Eat 3-5 servings of vegetables each day.	N	S	O	R
27. Discuss my health concerns with health professionals.	N	S	O	R
28. Do stretching exercises at least 3 times per week.	N	S	O	R
29. Use specific methods to control my stress.	N	S	O	R
30. Work toward long-term goals in my life.	N	S	O	R
31. Touch and am touched by people I care about.	N	S	O	R
32. Eat 2-3 servings of milk, yogurt or cheese each day.	N	S	O	R
33. Inspect my body at least monthly for physical changes/danger signs.	N	S	O	R
34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).	N	S	O	R
35. Balance time between work and play.	N	S	O	R
36. Find each day interesting and challenging.	N	S	O	R
37. Find ways to meet my needs for intimacy.	N	S	O	R
38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	N	S	O	R
39. Ask for information from health professionals about how to take good care of myself.	N	S	O	R
40. Check my pulse rate when exercising.	N	S	O	R
41. Practice relaxation or meditation for 15-20 minutes daily.	N	S	O	R
42. Am aware of what is important to me in life.	N	S	O	R
43. Get support from a network of caring people.	N	S	O	R
44. Read labels to identify nutrients, fats, and sodium content in packaged food.	N	S	O	R
45. Attend educational programs on personal health care.	N	S	O	R
46. Reach my target heart rate when exercising.	N	S	O	R
47. Pace myself to prevent tiredness.	N	S	O	R
48. Feel connected with some force greater than myself.	N	S	O	R
49. Settle conflicts with others through discussion and compromise.	N	S	O	R
50. Eat breakfast.	N	S	O	R
51. Seek guidance or counseling when necessary.	N	S	O	R
52. Expose myself to new experiences and challenges.	N	S	O	R

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APPENDIX E

Health Literacy Survey Short Form 12 Questionnaire

English Version

Health Literacy Survey Short Form 12 © HLS-EU Q47 (Sorensen et al, 2012); HL-SF12 (van Duong et al, 2015)							
HLS-EU-Q Item No.	**HLS-EU Matrix**	**HL-SF 12 Item No.**	On a scale of very easy to difficult, how would you say it is to…	1 very difficult	2 fairly difficult	3 fairly easy	4 very easy
Q1.2	HC-FHI-2	A.2.1	find information on treatments of illnesses that concern you?				
Q1.6	HC-UHI-2	A.2.2	understand the leaflets that come with your medicine?				
Q1.10	HC-JHI-2	A.2.3	judge the advantages and disadvantages of different treatment options?				
Q1.15	HC-AHI-3	A.2.4	call an ambulance in an emergency?				
Q1.18	DP-FHI-2	A.2.5	find information on how to manage mental health problems like stress or depression?				
Q1.23	DP-UHI-3	A.2.6	understand why you need health screenings?				
Q1.26	DP-JHI-3	A.2.7	judge which vaccinations you may need?				
Q1.30	DP-AHI-2	A.2.8	decide how you can protect yourself from illness based on advice from family and friends?				
Q1.33	HP-FHI-2	A.2. 9	find out about activities that are good for your mental well-being?				
Q1.39	HP-UHI-3	A.2.10	understand information in the media on how to get healthier?				
Q1.43	HP-JHI-3	A.2.11	judge which everyday behaviour is related to your health?				
Q1.45	HP=AHI-2	A.2.12	join a sports club or exercise class if you want to?				

Legend for HLS-EU Matrix:

HC= Health care
DP= Disease Prevention
HP= Health Promotion
FHI= Finding Health Information
UHI=Understanding Health Information
JHI= Judging Health Information
AHI= Applying Health Information

Appendix F

Data Collection Protocols

Data Collection Protocols

The author of this research proposal intended to adapt the WHO STEPS Surveillance Manual (2008) as a guide in data collection procedures. This data collection protocol encompasses general guidelines for interviewers, step-by-step guide for eliciting socio-demographic data, physical measurement of waist circumference, responses to diabetes risk score questionnaire, and self-reported measures of health literacy and health promoting behaviors.

Step 1: Approaching Households, Informing Participants, and Obtaining Consent

1. Contact barangay captain to inform about the survey and gain their support and cooperation.

2. Ensure sufficient quantities of printed instrument: "answer" showcards, item for physical measurement of waist circumference e.g. tape measure, and survey instrument forms, available for the interviewer to use.

3. The following parts of the instruments should be completed prior to beginning data collection.
    a. Participant serial ID number.
    b. Interviewer ID number.

4. Obtain household lists with associated address of the participants and map if necessary.

5. Physically knock on the door. Use the following decision pathway to help with different situations after knocking on the door:
    a. Someone is at home: speak to the first adult you encounter in the household.
    b. Nobody answers the door-knock: look around side of the house and see if someone is nearby.
    c. Nobody is at home: leave a notification of the research survey visit and record details in the comment section of the interview form.
    d. Household members are not available at the time of the first visit: make at least 2 different visits to obtain an interview. Choose times that are different—early morning or late afternoon.

6. Record if anyone is home, and date and time of the visit.

7. Introduce yourself and explain the reason for your visit as follows:

    a. My name is _____ and this is _____. I am a masteral student in nursing of University of Philippines Open University and I am working on a research study to conduct a survey on diabetes risk assessment, health literacy and health promoting behaviors. I am hoping that the people in this house will participate in this survey. I would like to find out if (name of participant) is residing in this house. He/She was selected as one of the participant in the study and I would like to take his/her consent to participate.

8. Explain the purpose of the research. Explain that once study data has been collected and analyzed, this will help health services plan and determine public health priorities, that is, to prevent diabetic disease epidemics before it occurs and monitor and evaluate population wide diabetes programs.

9. Inform the participant on the details of the study before he will be asked to sign the consent form.

10. Explain that information will be collected from a number of pre-selected households throughout the barangay. Explain how data will be collected as appropriate through interview questions, and measurement of waist circumference.

11. Run through the whole data collection process with the participant, using the following as a guide:

    a. Stage 1. Asking questions about participant's:
        i. Age
        ii. Sex
        iii. Civil status
        iv. Monthly income
        v. Educational Attainment
        vi. Family structure
        vii. Health Status
        viii. Health insurance
        ix. Number of doctor's visit in the last year
        x. Family history of diabetes
        xi. History of high blood sugar readings.
        xii. History of high blood pressure

    b. Stage 2. Taking the waist circumference measurement.

    c. Stage 3. Self-report of health literacy

    d. Stage 4. Self-report of health promoting behaviors.

12. It is estimated that the total survey will take only 30 minutes approximately, with the following breakdown of time-frames:
    a. Stage 1: 8 minutes
    b. Stage 2: 2 minutes
    c. Stage 3: 10 minutes
    d. Stage 4: 10 minutes

    TOTAL: 30 minutes

13. To help explain to each participants the benefits, their rights and confidentiality, the following items should be utilized as a guide:
    a. Community benefits: The results of this study will be used to assist the government offices to develop public health programs that target efforts to lower the risk factors that lead to diabetes.

b. Individual rights: Participants may decline to take part in the study, withdraw their consent at anytime, and not answer any questions in the interview that they do not wish to answer.
c. Confidentiality: Participants should provide their name and contact information so that they can be contacted if there is any problem following analysis of the information and follow up is necessary.
d. Participation and data provided will be completely confidential.
e. While the data from this study may be sent elsewhere for analysis, no personally identified information will be provided for this analysis.
f. Their name and their household will not be used in any report of the study.

14. Each participant must provide both verbal and written consent before taking part in the survey. For those who will take part in the study, follow the steps to obtain verbal and written consent:
    a. For each participant, use two copies of the consent forms as follows:
        i. One copy for the participant.
        ii. One copy for the interviewer/researcher.

    b. Allow the participant to read the consent form, or in the case of poor eyesight or illiteracy, read it out to them.

    c. Use the guidelines below to help with the following situations:
        i. When the intended participant answers NO to signing the consent form, ask the participant whether he/she understands the questions.
        ii. When the participant does not understand the question, rephrase the question.
        iii. When the participant understands the question and the answer but still do not like to give consent, this means that the individual will not participant in the survey.

    d. Get the participant to sign both copies if consented.
    e. As the interviewer, sign as a witness.
    f. Thank him/her for agreeing to take part in the survey.

Step 2: Socio-Demographics

1. Age. Ask date of birth and compute for the age accordingly. If the age is unknown, help participant estimate their age by interviewing them about their recollection of widely known major events.

2. Sex. Record male or female as observed.

3. Civil status. Select the most appropriate response listed in the questionnaire.

4. Level of education. Enter the number of years of education excluding pre-school and kindergarten. If a person attended a few months of the first year of secondary school but did not complete the year, select “elementary school”. If

a person only attended a few years of elementary school select “no schooling”. Select appropriate responses.

5. Employment status. Select the most appropriate response listed in the questionnaire.

6. Family structure. Select the most appropriate response listed in the questionnaire.

7. Health status. Select the most appropriate response listed in the questionnaire.

8. Health insurance. Select the most appropriate response listed in the questionnaire.

9. Monthly income. Record the average earnings of the household by month in Philippine Pesos. If participant does not know the amount, give an estimate of the annual household income by reading options to him. Is it (insert quintile values in Philippine pesos)? If the participant refused, record as refused (RF). If the participant does not know, record as don’t know (DK).

10. Number of doctor’s visit in the last year. Select the most appropriate response listed in the questionnaire.

Step 3: Physical Measurement

1. Measuring WAIST CIRCUMFERENCE:
    a. Waist circumference measurements are taken to provide answer to classify the waist circumference of participants according to weighted scores (See simplified FINDRISC tool).

    b. To take waist circumference, the following equipment are needed: constant tension tape, e.g. *ELENXS 1.5M*, pen and chair or coat stand to place participant’s clothes.

    c. Private area is needed for this measurement. This could be a separate room or an area that has been screened off from other people within the household.

    d. This measurement should be taken without clothing, that is, directly over the skin. If this is not possible, the measurement may be taken over light clothing. It must not be taken over thick or bulky clothing. This type of clothing must be removed.

    e. The measurement should be taken at the end of a normal expiration, with the arms relaxed at sides, and at the midpoint between the lower margin of the last palpable rib, and the top of the iliac crest (hip bone).
        1) Standing to the side of the participant, locate the last palpable rib and the top of the hipbone. The participant may be asked to assist in locating these points on their body.

2) Ask the participant to wrap the tension tape around themselves and then position the tape at the midpoint of the last palpable rib and the top of the hip bone, making sure to wrap the tape over the same spot on the opposite side. Check that the tape is horizontal across the back and front of the participant and as parallel with the floor as possible.
3) Ask the participant to stand with feet together, with weight evenly distributed across both feet, hold the arms in a relaxed position at the sides; and breathe normally for a few breaths and then make a normal expiration.
4) Measure waist circumference and read the measurement at the level of the tape to the nearest 0.1 cm, making sure to keep the measuring tape snug but not tight to cause compression of the skin.
5) Record the measurement on the participant's instrument. Measure only once and record.

Step 3: Diabetes Risk Score Assessment

1. The Simplified Finnish Diabetes Risk Score (FINDRISC) Tool will be utilized to calculate for risk of developing Type 2 Diabetes Mellitus within 10 years.

2. There will be 8 items in the FINDRISC Tool. The following responses are indicated with their corresponding weight of scores:

    a. Item 1: Age
        i. Under 45 years: 0
        ii. 45-54 years: 2
        iii. 55-64 years: 3
        iv. Over 64 years: 4

    b. Item 2: Waist Circumference (modified based on WHO as per South Asian Standards e.g. Filipinos)

        i. Men
            1. Less than 90 cm: 0
            2. 90-102 cm: 3
            3. More than 102 cm: 4

        ii. Women
            1. Less than 80 cm: 0
            2. 80-88 cm: 3
            3. More than 88 cm: 4

    c. Item 3: Positive Hypertension History
        i. No: 0
        ii. Yes: 1

    d. Item 7: Positive Blood Sugar History
        i. No: 0
        ii. Yes: 1

e. Item 8: Family History of Diabetes
    i. No: 0
    ii. Yes: grandparents, aunt, uncle, first cousin: 3
    iii. Yes: parent, brother, sister, own child: 5

3. The total risk score will range from a minimum of 0 to a maximum of 20. A cut off score greater than or equal to seven (7), will be the decisional score for the participants to be considered at risk for diabetes.

Step 4: Health Promoting Behaviors Questionnaire

For those participants who are able to read and understand *Hiligaynon,* the HPLP II Hiligaynon version will be administered. However, for those who are not able to read, an item by item, word by word reading of the instrument by the researcher will be employed, and choices for the answers such as "never", "sometimes", "often, and "routinely" after each item of the questionnaire will be repeatedly provided. All the responses will be recorded thereafter.

Step 5: Health Literacy Questionnaire

For those participants who are able to read and understand *Tagalog,* the HL-SF12 *Tagalog* version will be administered. However, for those who are not able to read, an item-by-item, word-by-word reading of the instrument by the researcher will be employed, and choices for the answers such as "very easy", "easy", "difficult", and "very difficult" after each item of the questionnaire will be repeatedly provided. All the responses will be recorded thereafter.

Step 6: Data Entry

1. All results that are recorded on the instrument must be encoded clearly as possible to avoid ambiguity and confusion when checking and entering the results. This survey intends to conduct a paperless survey using digital electronic formats, excluding the informed consent.

2. Some general requirements for recording survey information are as follows:
    a. Record the participant serial number on each instrument and each page.
    b. If a question has been skipped by mistake, correct it.
    c. If a participant changes his/her mind on one option, record the new answer.
    d. Record only those answers that are relevant to the survey.
    e. Record comments or explanations in brackets in the instrument next to the corresponding question.
    f. Do not get too absorbed recording, keep the participant's interest by saying the participant's response aloud as you encode it.

3. Use the following guidelines to help with some common issues that might be encountered:
    a. Uncertain about a response: Repeat question and record the answer exactly. Do not paraphrase response.
    b. If the participant does not know the answer to a question: Record as DK.
    c. You have missed a question: Go back and ask the question, making a noted that the question was asked out of sequence.
    d. Missing data is not discovered until after interview. If possible, re-contact participant and ask question. Note that the question was asked out of sequence. If not possible to go back to the participant, note that the question was skipped due to interviewer error, IE.
    e. The participant refuses to answer question: Record RF. Before accepting refusal, explain the objective of the question to the participant.

4. Before leaving the household, check the instrument and make sure that:
    a. All questions have been answered and all the measurements have been taken as applicable.
    b. The information recorded is clear and legible.
    c. Probing comments are indicated.
    d. All the information has been completed including the participant's serial number on every page.

Appendix G

Request Letter for Permission to Use an Existing Survey

November 08, 2017

Dr. Jaana Lindström.
Department of Chronic Disease Prevention
National Public Health Institute
Helsinki, Finland

and

Dr. Jaako Tuomilehto
Professor Emeritus Public Health
University of Helsinki
Helsinki, Finland

Dear Dr. Lindström and Dr. Tuomilehto:

Greetings! I hope this email finds you well.

I am a nursing masteral student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis tentatively titled, "*Health Promoting Behaviors of Adults At Risk for Diabetes in a Rural Low Income Setting,"* under the direction of my thesis committee, chaired by Dr. Araceli O. Balabagno.

I would like your permission to reproduce, translate in *Filipino* language and use the survey instrument, FINDRISC Tool (https://www.diabetes.fi/files/502/eRiskitestilomake.pdf), for my research study. I would like to use and print your survey under the following conditions:

- I will use this survey only for my research study and will not sell or use it with any compensated or curriculum development activities.
- I will include the copyright statement on all copies of the instrument.
- I will send my research study and one copy of reports, articles, and the like that make use of these survey data promptly to your attention.

Attached in this email are my university ID and the pdf file of this request letter. If these are acceptable terms and conditions, please indicate so by replying your positive response to this email address, christiansandor.ydirin@upou.edu.ph.

Sincerely yours,

Christian Sandor B. Ydirin, BSN, RN
Master of Arts in Nursing Candidate

November 08, 2017

Dr. Susan Noble Walker
Professor Emeritus
University of Nebraska Medical Center
Omaha, Nebraska

Dear Dr. Walker:

Greetings! I hope this emails finds you well.

I am a nursing masteral student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis tentatively titled, "*Health Promoting Behaviors of Adults At Risk for Diabetes in a Rural Setting,"* under the direction of my thesis committee, chaired by Dr. Araceli O. Balabagno.

I would like your permission to reproduce, translate in *Filipino* language and use the survey instrument, Health Promoting Lifestyle Profile II (HPLP II), for my research study. I would like to use and print your survey under the following conditions

- I will use this survey only for my research study and will not sell or use it with any compensated or curriculum development activities.
- I will include the copyright statement on all copies of the instrument.
- I will send my research study and one copy of reports, articles, and the like that make use of these survey data promptly to your attention.

Attached in this email are my University ID and the pdf file of this letter. If these are acceptable terms and conditions, please indicate so by replying your positive response to this email address christiansandor.ydirin@upou.edu.ph.

Sincerely yours,

Christian Sandor B. Ydirin, BSN, RN
Master of Arts in Nursing Candidate

November 15, 2017

Mr. Marky Legaspi
Faculty, College of Nursing
West Visayas State University
La Paz, Iloilo City, Philippines

Dear Mr. Legaspi:

Greetings! I hope this email finds you well.

I am a nursing masteral student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis tentatively titled, "*Health Promoting Behaviors of Adults At Risk for Diabetes in a Rural Low Income Setting,"* under the direction of my thesis committee, chaired by Dr. Araceli O. Balabagno.

I would like your permission to acquire and reproduce the HPLP II tool in *Hiligaynon* version, utilized in your previous study. Rest assured, that Dr. Susan Noble Walker, also granted me permission, as reflected in the forwarded email, to use the original HPLP II tool in English version. I would like to use and print your survey under the following conditions

- I will use this tool only for my research study and will not sell or use it with any compensated or curriculum development activities.
- I will include the copyright statement on all copies of the instrument.
- I will send my research study and one copy of reports, articles, and the like that make use of these survey data promptly to your attention.

Attached in this email are my university ID and the pdf file of this request letter. If these are acceptable terms and conditions, please indicate so by replying your positive response and the copy of the said instrument to this email address, christiansandor.ydirin@upou.edu.ph.

Sincerely yours,

Mr. Christian Sandor B. Ydirin
Master of Arts in Nursing Candidate

August 14, 2018

Dr. Kristine Sorensen
Project Coordinator
EU Health Literacy Project
HLS-EU Consortium

Dear Kristine Sorensen,

I am a Master of Arts in Nursing candidate of University of the Philippines Open University, currently working on my thesis, which aims to determine the relationship of health literacy and health promoting behaviors among adults at risk for diabetes in a low income setting.

I would appreciate if you could grant me permission to utilize the HLS-EU- Q16 Survey Tool (see attached pdf) and reproduce it for my study. Rest assured that the following conditions will be observed during the conduct of the survey:

1. I will use this survey only for my research study and will not sell or use it with any compensated or curriculum development activities.
2. I will include the copyright statement on all copies of the instrument.
3. I will send my research and one copy of reports, articles, and the like that make use of these survey data pro to your attention.

Attached herewith are my identification and resume for your perusal.

Sincerely yours,

Christian Sandor B. Ydirin, BSN, RN
Master of Arts in Nursing Candidate
University of the Philippines Open University
Los Banos, Laguna, Philippines

August 24, 2018

Dr. Tuyen Van Duong
Asia Health Literacy Association
11, Nant d'Avril Road CH
1214 Geneva, Switzerland

Dear Dr. Tuyen Van Duong:

I am a Master of Arts in Nursing candidate of University of the Philippines Open University, currently working on my thesis, which aims to determine the relationship between health literacy and health promoting behaviors among adults at risk for diabetes in a low-income setting.

I would appreciate if you could grant me permission to utilize the HLS-EU-AQ Tool and reproduce it for my thesis.

Attached herewith is a .pdf file of my identification, formal letter of request and resume for your perusal.

Respectfully yours,

Christian Sandor Badana Ydirin, BSN, US RN
ID No. 2014-92394
UPOU-MAN AHN Offshore Student
Mobile:
Email: christiansandor.ydirin@upou.edu.ph

July 30, 2018

Ms. Marla Briones

Thru:

Hygeia Grace C. Agosto, BSPH, MPH
Department of Epidemiology and Biostatistics
College of Public Health UP Manila
625 Pedro Gil St, Ermita Manila 1000 Philippines

Madam:

I am a Master of Arts in Nursing candidate of University of the Philippines Open University, currently working on my thesis, which aims to determine the relationship between health literacy and health promoting behaviors among adults at risk for diabetes in a low-income setting.

I would appreciate if you could **grant me permission to utilize the HLS-EU-AQ Tool** and reproduce it for my thesis. Rest assured that the following conditions would be observed during the conduct of the survey:

1. I will use this survey only for my research study and will not sell or use it with any compensated or curriculum development activities.

2. I will include the copyright statement on all copies of the instrument.

3. I will send my research study and one copy of reports, articles, and the like that make use of these survey data promptly to your attention.

Attached herewith is my identification and resume for your perusal.

Respectfully yours,

Christian Sandor B. Ydirin
Researcher
Master of Arts in Nursing Candidate
UP Open University
Los Banos, Philippines

Appendix H

Granted Permission to Use the Instruments

November 08, 2017 06:06 PM
Lindstrom, Jaana <jaana.lindstrom@thl.fi>
To: <christiansandor.ydirin@upou.edu.ph>
Cc: Tuomilehto, Jaakko <jaakko.tuomilehto@thl.fi>
Re: Requesting permission to use FINDRISC tool

Dear Christian,
Thank you for your message. I hereby grant you my permission to use the FINDRISC tool in our research, under the terms you have described.
Best regards,
Jaana

****

Adjunct Professor Jaana Lindström
Research Manager
Chronic Disease Prevention Unit (KEKA)
Department of Health Solutions (KETO)
National Institute for Health and Welfare (THL)
mobile: +358 29 524 8635
email: jaana.lindstrom@thl.fi

P.O. Box 30, 00271 Helsinki
Finland
Visiting address: Mannerheimintie 168b, 4th floor
****

From: Grace Marie Ku <gracemariekumd@yahoo.com>
Subject: Re: Requesting permission to use FINDRISC TOOL
Date: November 11, 2017 at 7:13:38 AM CST
To: Christian Sandor Ydirin <christiansandor.ydirin@upou.edu.ph>
Reply-To: Grace Marie Ku <gracemariekumd@yahoo.com>

Dear Christian,

Thank you for your email.

Yes indeed, as Jaako has informed you, I adapted the Finnish Diabetes Risk Score based on findings of my diabetes screening activities in Northern Philippines (the First Line Diabetes Care or FiLDCare Project). The results of the screening activity were published in Primary Care Diabetes in 2013 http://www.primary-care-diabetes.com/article/S1751-9918(13)00084-3/fulltext

I collected data on the full FINDRISC during our community-based screening activities and came up with the modified and simplified risk scores, which performed slightly better (though not statistically significant) than the original score. The modified and simplified versions were rendered based on Asian standards (cut-offs for BMI, waist circumference) and the Philippine context. .The simplified risk score (which had the highest ROC AUC) would be the easiest to implement - it does away with the BMI (no need for taking the weight and height and the computations) and the question on antihypertensive medication (which is tricky because more than 50% of Filipinos with hypertension do not take any meds) was modified. The simplified risk score questionnaire asks on (1) age, (2) waist circumference, (3) past medical history of hyperglycemia, (4) past medical history of high blood pressure and (5) family history of diabetes.

It would be nice if you could validate the score, and maybe this will help push for its use in community-based health promotion activities throughout the Philippines.

Do not hesitate to get in touch should you need further advice or guidance.

Best regards,

GRACE MARIE V. KU, MD, MPH, FPAFP, PhD
Master in Public Health - Health Systems Management & Policy
Fellow, Philippine Academy of Family Physicians
Doctorate in Medical Sciences (Public Health)

Executive Officer
Ethics Review Board
Medecins Sans Frontieres (Doctors Without Borders)
International Office, Brussels, Belgium

November 10, 2017 10:34PM
Walker, Susan Noble <swalker@unmc.edu>
To: <christiansandor.ydirin@upou.edu.ph>
Re: Requesting permission to use HPLP II tool

Dear Christian,

You have my permission.

Best wishes,
Susan

Dr. Susan Noble Walker
Professor Emeritus
University of Nebraska Medical Center
Omaha, Nebraska

The information in this e-mail may be privileged and confidential, intended only for the use of the addressee(s) above. Any unauthorized use or disclosure of this information is prohibited. If you have received this e-mail by mistake, please delete it and immediately contact the sender.

From: Marky Legaspi <marky.legaspi@wvsu.edu.ph>
Subject: Re: Requesting permission to use HPLP II Hiligaynon version
Date: November 20, 2017 at 1:27:51 AM CST
To: UPOU email <christiansandorydirin@gmail.com>

Pls pm me if you received my email Christian.

On Mon, Nov 20, 2017 at 3:25 PM, Marky Legaspi <marky.legaspi@wvsu.edu.ph> wrote:

Attachment: HEALTH PROMOTING LIFESTYLE PROFILE II (HPLP II).docx

On Wed, Nov 15, 2017 at 5:57 PM, UPOU email <christiansandorydirin@gmail.com> wrote:
November 15, 2017

Mr. Marky Legaspi
Faculty, College of Nursing
West Visayas State University
La Paz, Iloilo City, Philippines

Dear Mr. Legaspi:

Greetings! I hope this email finds you well. I am a nursing masteral student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis tentatively titled, "*Health Promoting Behaviors of Adults At Risk for Diabetes in a Rural Low Income Setting,"* under the direction of my thesis committee, chaired by Dr. Araceli O. Balabagno.

I would like your permission to acquire and reproduce the HPLP II tool in *Hiligaynon* version, utilized in your previous study. Rest assured, that Dr. Susan Noble Walker, also granted me permission, as reflected in the forwarded email, to use the original HPLP II tool in English version.

Attached in this email are my university ID and the pdf file of this request letter. If these are acceptable terms and conditions, please indicate so by replying your positive response and attaching a copy of the said instrument to this email address, christiansandor.ydirin@upou.edu.ph.

Sincerely yours,

Christian Sandor B. Ydirin
Master of Arts in Nursing Candidate

and resume for your perusal.
Sincerely yours,
Christian YdirinChristian Sandor B. Ydirin, BSN, RN
Master of Arts in Nursing Candidate
University of the Philippines Open University
Los Banos, Laguna, Philippines

3848C4AA-363D-481C-ABCE-861C7DEFA3CD.png

RESUME.pdf



Kristine Sorensen to you 4 hours ago

Dear Christian Ydirin
You are very welcome to use the HLS-EU-Q for your research.
Please share your results with us so we can learn from you.
Kind regards
Kristine Sørenseb

Reply | Mark as unread | Archive conversation

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From: Duong Van Tuyen <duongtuyenvna@gmail.com>
Subject: Re: Requesting permission to use HLS-EU-AQ (AHLA) Tool for Master's Thesis
Date: August 25, 2018 at 4:50:48 AM CDT
To: christiansandor.ydirin@upou.edu.ph
Cc: "Prof. Peter Chang" <peter.chang3@gmail.com>

Dear Christian Sandor Badana Ydirin,

It is great to learn from your interest in health literacy research. We have had permission to use the questionnaire in Asian countries from HLS-EU society (Represented by Dr. Kristine Sorensen and her colleague). You can find the publication via https://doi.org/10.1016/j.je.2016.09.005

The HLS-EU consortium has also developed the short forms including HLS-EU-Q16 and HLS-EU-Q6 for the quick assessment. You may ask the permission to use these questionnaires from Dr. Kristine Sorensen.

In the Asia context, the short-form health literacy questionnaire (HL-SF12) was validated in different patient groups in Taiwan, which you can refer to the publication at http://dx.doi.org/10.1016/j.anr.2017.02.001

You are suggested to use the new comprehensive health literacy short form (HL-SF12), and your application to use the HL-SF12 is granted. It is suggested to have further validation in the new study populations. If you have any modification in the questionnaire, you are suggested to let us know before conducting the survey.

Please let us know if you have any question regarding health literacy study.

Have a novel idea for your study.

Best regards,

Tuyen V Duong,

From: Hygeia Grace Agosto <hcagosto@up.edu.ph>
Date: 30 July 2018 at 3:26:29 AM GMT-5
To: UPOU email <christiansandorydirin@gmail.com>
Subject: Re: Requesting permission to use HLS-EU-A-Q Tool

Dear Mr. Ydirin,

Regarding utilization of the Tagalog version of the HLS-EU-A-Q tool, it will be best if you inquire from Ms. Marla Briones (**marlabriones@yahoo.com**) since she was the one who translated the questionnaire. In addition, you will need to get permission from the Asia Health Literacy Association (**ahla.secretariat@gmail.com**) since they hold ownership of the original version of the said instrument.

Hope this helps, kindly message me if you have other concerns.

Thank you.

Sincerely,

Hygeia Agosto

From: "Marla Vina A. Briones" <marlabriones@yahoo.com>
Subject: Re: Requesting permission to use HLS-EU-A-Q Tool Tagalog Version
Date: July 30, 2018 at 6:17:48 PM CDT
To: Christian Sandor Ydirin <christiansandor.ydirin@upou.edu.ph>
Reply-To: "Marla Vina A. Briones" <marlabriones@yahoo.com>

Good day Mr. Ydirin,

Yes, I'd gladly share it with you.
However, please make sure that appropriate citations are included in your paper.
I haven't had the time to submit it for publication; thus, it is still an unpublished master's thesis.

Also, please contact the AHLA secretariat and ask their permission to use the translated version of the HLS-EU-A-Q.
I asked for their permission to translate last 2014 using my maiden name: Marla Vina G. Austria
I also presented the partial results of my paper during the 2015 conference in Tainan.

Please see attached file for the copy of the questionnaire (Part 2).

Let me know if there are questions

Marla Vina A. Briones, RMT, MSc. Epidemiology (Public Health)
Owner, Marla Vina Technical Consultancy

Appendix I

Individual Informed Consent

PARTICIPANT ID NO.: _____ INTERVIEWER ID NO. _____ ZONE NO.: _____ 1

ABISAR SA PAGPAHANUGOT

Ako si, **Christian Sandor B. Ydirin**, isa ka masteral nga estudyante sa narsing sang University of the Philippines—Open University, Los Banos, Laguna, Philippines, nagahikot sang isa ka pagtul-id (*survey*) nga ginatiguluhan, "*Health Promoting Behaviors and Health Literacy Among Adults at Risk for Diabetes in a Rural Setting*." (Mga Binatasan kag Ihibalo Tuhoy sa Pagtib-ong sang Ika-ayong Lawas sang mga Tawo nga may Risgo nga Magka-Dyabetes).

Nagapangayo ako sang inyo nga hungod nga pagpakid-upod sa ini nga pagtukib (*research)*. Ang katuyu-an sini amo ang pag-ihibalo sang mga tawo nga may dako nga risgo nga magka-dyabetes, kag kung ano ang ila mga pamatasan kag nahibaluan tuhoy sa pagtib-ong sang ila kaugalingon nga ika-ayong lawas. Kung ikaw magapa-ambit, pagapamangkuton ikaw nahanungod sa imo nga impormasyon, kaabi sang imo edad, trabaho, sunson nga pagbisita sa doktor kag iban pa. Sa imo nga pagpasugot, paga-takson ang imo nga hawak (*waist circumference)* kag may paga-sabton ikaw nga mga pamangkutanon nahanungod sa imo pag-halong kag mga nahibaluan tuhoy sang imo nga ikaayong-lawas.

Ang pagtukib sang mga risgo nga posible maging rason nga ikaw magka-dyabetes, kag ang mga paagi para malikawan ini nga mga katalagman, amo ang mga benepisyo nga makuha mo sa pag-intra sa ini nga pagtul-id. Para sa imo seguridad, huput nga pagahimuon konpidensyal ang imo pangalan kag pagataguon sang maayo ang mga impormasyon nga imo ginhatag. Ang pagpakid-upod mo sa ini nga pagtul-id bug-os nga boluntaryo. Kung ginapakamaayo mo nga indi magpa-ambit, makasalig ikaw nga wala ini malain nga bunga. Pwede ka nga mag-untat sa pagpakid-upod sa ini nga *survey* sa ano man nga tyempo nga imo madesisyunan. Sa imo pagpirma sa ini nga papel, nagapamatood ikaw nga naintindihan mo ang mga impormasyon nga namitlang kag hilway mo nga ginahatag ang imo pagsugot sa pagpa-ambit sa sini nga *survey*.

Pangalan (*optional*)**: _____**
Pirma: _____
Petsa: _____
Witness: _____

Madamo gid nga salamat,

Christian Sandor B. Ydirin, BSN, RN
Contact No.: +639397366596
Principal Researcher, Master of Arts in Nursing Candidate
University of the Philppines Open University
Los Banos, Philippines

Asst. Prof. Queenie Ridulme, BSN, RN, MAN
Adviser & Program Chair, MAN FMDS
University of the Philppines Open University
Los Banos, Philippines

Melinda F. Lumanta
Vice Chancellor & Chair, Research & Publications Committee
University of the Philppines Open University
Los Banos, Philippines

Appendix J

Barangay Captain Permission Letter

October 28, 2019

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mr. Melchor Obal:

Greetings! I am a nursing masters student from **University of the Philippines Open University,** Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Low Income Setting,*" under the direction of my thesis adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

In line with this, I would like to request from your good office to allow me to conduct a survey among adult participants, age 18 to 59 years old, about the following:

a. Questions about age, sex, civil status, monthly income, educational attainment, family structure, health status, health insurance, number of annual doctor's visit, family hisory of diabetes, history of high blood sugar and history of high blood pressure.
b. Measurement of waist circumference.
c. Questions about health literacy.
d. Questions about health promoting behaviors.

Since the study involves random selection of participants, a copy of the residents in the barangay will be needed. Rest assured that individual consent to participate will be asked among the residents who will be chosen. May I request a copy from your office the lists of the residents in Brgy. Vizcaya. Attached herewith is the copy of survey questionnaire, my university and professional license IDs for your reference. I am looking forward for your favorable response regarding this matter.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Approved by:

Hon. Melchor Obal
Brgy. Captain

Appendix K

Barangay Health Workers Offer Letter

October 28, 2019

To: **Mrs. Leny Billones**
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mrs. Lenny Billones:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

In linc with this, I would like to request your assistance in conducting a survey among adults, age 18 to 59 years old, about the following:

a. Questions about their age, sex, civil status, monthly income, educational attainment, family structure, health status, health insurance, number of annual doctor's visit, family hisory of diabetes, history of high blood sugar and history of high blood pressure.
b. Measurement of waist circumference.
c. Questions about health literacy.
d. Questions about health promoting behaviors.

The study involves random selection of participants, and individual consent to participate will be asked among the residents who will be chosen. Attached herewith is the copy of survey questionnaire, the list of residents that you will survey, my university and professional license IDs for your reference. Hoping for your positive response in this matter and rest assured that you will be compensated for your efforts in cash and kind.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizcaya

October 28, 2019

To: **Mrs. Analie de Asis**
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mrs. Analie de Asis:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

In line with this, I would like to request your assistance in conducting a survey among adults, age 18 to 59 years old, about the following:

a. Questions about their age, sex, civil status, monthly income, educational attainment, family structure, health status, health insurance, number of annual doctor's visit, family hisory of diabetes, history of high blood sugar and history of high blood pressure.
b. Measurement of waist circumference.
c. Questions about health literacy.
d. Questions about health promoting behaviors.

The study involves random selection of participants, and individual consent to participate will be asked among the residents who will be chosen. Attached herewith is the copy of survey questionnaire, the list of residents that you will survey, my university and professional license IDs for your reference. Hoping for your positive response in this matter and rest assured that you will be compensated for your efforts in cash and kind.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizcaya

October 28, 2019

To: **Mrs. Annie Villanueva**
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mrs. Annie Villanueva:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

In linc with this, I would like to request your assistance in conducting a survey among adults, age 18 to 59 years old, about the following:

a. Questions about their age, sex, civil status, monthly income, educational attainment, family structure, health status, health insurance, number of annual doctor's visit, family hisory of diabetes, history of high blood sugar and history of high blood pressure.
b. Measurement of waist circumference.
c. Questions about health literacy.
d. Questions about health promoting behaviors.

The study involves random selection of participants, and individual consent to participate will be asked among the residents who will be chosen. Attached herewith is the copy of survey questionnaire, the list of residents that you will survey, my university and professional license IDs for your reference. Hoping for your positive response in this matter and rest assured that you will be compensated for your efforts in cash and kind.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizcaya

October 28, 2019

To: Mrs. Bevelyn Golingay Camacho
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mrs. Bevelyn Camacho:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

In line with this, I would like to request your assistance in conducting a survey among adults, age 18 to 59 years old, about the following:

a. Questions about their age, sex, civil status, monthly income, educational attainment, family structure, health status, health insurance, number of annual doctor's visit, family hisory of diabetes, history of high blood sugar and history of high blood pressure.
b. Measurement of waist circumference.
c. Questions about health literacy.
d. Questions about health promoting behaviors.

The study involves random selection of participants, and individual consent to participate will be asked among the residents who will be chosen. Attached herewith is the copy of survey questionnaire, the list of residents that you will survey, my university and professional license IDs for your reference. Hoping for your positive response in this matter and rest assured that you will be compensated for your efforts in cash and kind.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN Researcher
Master of Arts in Nursing Candidate

Noted

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizcaya

October 28, 2019

To: **Mrs. Brenda Denolo**
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mrs. Brenda Denolo:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

In linc with this, I would like to request your assistance in conducting a survey among adults, age 18 to 59 years old, about the following:

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b. Measurement of waist circumference.
c. Questions about health literacy.
d. Questions about health promoting behaviors.

The study involves random selection of participants, and individual consent to participate will be asked among the residents who will be chosen. Attached herewith is the copy of survey questionnaire, the list of residents that you will survey, my university and professional license IDs for your reference. Hoping for your positive response in this matter and rest assured that you will be compensated for your efforts in cash and kind.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizcaya

October 28, 2019

To: **Mrs. Edina Belonio**
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas Province
of Capiz, Philippines

Dear Mrs. Edina Belonio:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

In line with this, I would like to request your assistance in conducting a survey among adults, age 18 to 59 years old, about the following:

a. Questions about their age, sex, civil status, monthly income, educational attainment, family structure, health status, health insurance, number of annual doctor's visit, family hisory of diabetes, history of high blood sugar and history of high blood pressure.
b. Measurement of waist circumference.
c. Questions about health literacy.
d. Questions about health promoting behaviors.

The study involves random selection of participants, and individual consent to participate will be asked among the residents who will be chosen. Attached herewith is the copy of survey questionnaire, the list of residents that you will survey, my university and professional license IDs for your reference. Hoping for your positive response in this matter and rest assured that you will be compensated for your efforts in cash and kind.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizcaya

October 28, 2019

To: **Mrs. Geraldine Glendro**
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mrs. Geraldine Glendro:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

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b. Measurement of waist circumference.
c. Questions about health literacy.
d. Questions about health promoting behaviors.

The study involves random selection of participants, and individual consent to participate will be asked among the residents who will be chosen. Attached herewith is the copy of survey questionnaire, the list of residents that you will survey, my university and professional license IDs for your reference. Hoping for your positive response in this matter and rest assured that you will be compensated for your efforts in cash and kind.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizacaya

October 28, 2019

To: **Mrs. Lota Cabales**
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mrs. Lota Cabales:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

In line with this, I would like to request your assistance in conducting a survey among adults, age 18 to 59 years old, about the following:

a. Questions about their age, sex, civil status, monthly income, educational attainment, family structure, health status, health insurance, number of annual doctor's visit, family hisory of diabetes, history of high blood sugar and history of high blood pressure.
b. Measurement of waist circumference.
c. Questions about health literacy.
d. Questions about health promoting behaviors.

The study involves random selection of participants, and individual consent to participate will be asked among the residents who will be chosen. Attached herewith is the copy of survey questionnaire, the list of residents that you will survey, my university and professional license IDs for your reference. Hoping for your positive response in this matter and rest assured that you will be compensated for your efforts in cash and kind.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizcaya

October 28, 2019

To: **Mrs. Lyn Delmo Fernando**
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mrs. Lyn Delmo: Fernando:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

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Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy, Vizacaya

October 28, 2019

To: **Mrs. Melinde Bangud**
Brgy. Health Worker

Through: **Hon. Melchor Obal**
Brgy. Captain, Brgy. Vizcaya
Municipality of President Roxas
Province of Capiz, Philippines

Dear Mrs. Melinde Bangud:

Greetings! I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting,*" under the direction of my adviser, Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting; and to determine their health literacy and health promoting behaviors.

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The study involves random selection of participants, and individual consent to participate will be asked among the residents who will be chosen. Attached herewith is the copy of survey questionnaire, the list of residents that you will survey, my university and professional license IDs for your reference. Hoping for your positive response in this matter and rest assured that you will be compensated for your efforts in cash and kind.

Respectfully yours,

Christian Sandor B. Ydirin, BSN, RN
Researcher
Master of Arts in Nursing Candidate

Noted by:

Prof. Queenie R. Ridulme, BSN, RN, MAN
Thesis Adviser

Hon. Melchor Obal
Brgy. Captain, Brgy. Vizcaya

Appendix L

Request letter for Acquiring Data from Municipal Rural Health Unit

From: Christian Ydirin <christiansandor.ydirin@upou.edu.ph>
To: Pilar Posadas <posadaspilar@yahoo.com>
Sent: Sunday, August 25, 2018, 8:36:31 AM GMT+8
Subject: 2017 Health Situation of the Municipality of Pres Roxas

Dr. Pilar A. Posadas
Municipal Health Officer
Municipality of President Roxas
Province of Capiz, Philippines

Dear Dr. Posadas:

Greetings!

I am a nursing masters student from **University of the Philippines Open University**, Los Banos, Philippines, writing my thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Low Income Setting,"* under the direction of my thesis committee, chaired by Prof. Queenie R. Ridulme. The research aims to assess the risk of diabetes among adults in a rural setting and to determine their level of health promoting behaviors and health literacy.

In line with this, I would like to request from your good office any related literature of the *epidemiology e.g. prevalence rate of diabetes* among adults in the municipality of President Roxas (especially Brgy. Vizcaya), where the survey is to be conducted. This would give the baseline data for my research and help strengthened its purpose and review of related literature.

Attached herewith are identification and resume for your reference. I am looking forward for your favorable response regarding this matter.

Respectfully yours,
Christian Sandor Badana Ydirin
Researcher Master of Arts in Nursing Candidate

From: **Pilar Posadas** posadaspilar@yahoo.com
Subject: Fw: 2017 Health Situation of the Municipality of Pres Roxas
Date: October 1, 2018 at 7:42 PM
To: csandory@gmail.com

----- Forwarded Message -----
From: Pilar Posadas <posadaspilar@yahoo.com>
To: cssandory@gmail.com <cssandory@gmail.com>
Sent: Tuesday, October 2, 2018, 8:36:31 AM GMT+8
Subject: 2017 Health Situation of the Municipality of Pres Roxas

Dear Christian,

Good morning!

Attached is the 2017 Health Situation of the Municipality of Pres. Roxas.

The prevalence of of Diabetes Mellitus in the municipality is 1.4%. Out of 6, 132 patients screened for lifestyle related diseases,

88 patients were diagnosed with Diabetes Mellitus and are undergoing treatment at the Rural health Unit.

I hope this could help in your thesis proposal defense.



Health Situation.doc

2017 HEALTH SITUATION OF THE MUNICIPALITY OF PRES. ROXAS

A non-profit health institution owned by the Municipality of President Roxas, Capiz, the President Roxas Rural Health Unit is a 4-n-1 PhilHealth Accredited RHU. It is under the Bailan Interlocal Health Zone.

The Rural Health Unit directly provides basic health services to the people covering primary care such as maternal and child care, family planning, nutrition, immunization program, micronutrient supplementation, communicable and non-communicable disease control services, dental care services, environmental sanitation , and health education. It has a Birthing Facility with LTO from the Department of Health and a PhilHealth MCP accredited. It also has a Secondary Clinical Laboratory but it has no license from the Department of Health because the municipality could not afford to hire two Medical Technologists, which is one of the requirements of the of Clinical Laboratory.

Health Human Resources of the RHU are composed of one Municipal Health Officer, one Medical Health Officer III, three Public Health Nurses, six Rural Health Midwives, one Medical Technologist, two Rural Sanitation Inspectors, and one Laboratory Technician. One dentist and one dental aide from the provincial government were assigned at the Rural Health Unit to provide dental services to the poor 3x a week. The pool of volunteers composed of 142 Barangay Health Workers, 82 Community Health Team partners, 22 Barangay Nutrition Scholars assist the RHU staff in the delivery of community health services

Based on the records of the Civil Registrar, Pneumonia ranked 1st in the 10 leading cause of deaths in 2017. Non-communicable diseases such as cardiovascular diseases, cancer, chronic obstructive pulmonary disease (COPD), Liver Cirrhosis, Chronic Renal Failure, Upper GI Bleeding, Status Asthmaticus and Diabetes mellitus ranked 2nd -10th in the leading cause of death in 2017.

Based on the 2017 FHSIS, six of the ten leading cause of morbidity of all ages in 2017 are infectious diseases and four are non-communicable diseases. Hypertension, Post-traumatic wound infection, Genito-urinary tract infection and fever of unknown origin are the leading non-communicable diseases. Infectious diseases like acute respiratory infection, pneumonia, acute bronchitis, cough and colds and pulmonary tuberculosis ranked 1st, 2nd, 3rd, 5th, 8th, and 10th respectively. Hypertension ranked number 4 in the leading cause of morbidity.

The rise in non-communicable diseases along with existing prevalence of infectious diseases indicates that President Roxas has a double burden of disease. This disease pattern indicates that even as lifestyle-related illnesses are increasing, communicable diseases are still widely prevalent.

Crude Birth Rate decreased from 13.15 in 2016 to 8.06 per 1,000 populations in 2017. This may be attributed to the increasing Contraceptive Prevalence Rate of the municipality. Crude Death Rate decreased from 4.15 in 2016 to 3.16 per 1,000 populations in 2017. Infant Mortality Rate decreased also from 3.01/1000 live birth to 2.48 per 1,000 live birth. For the past 10 years, President Roxas has zero maternal death and this is attributed to quality maternal care.

SERVICE DELIVERY

Communicable Diseases

The municipality has only two reported cases of Sexually Transmitted Infection but there are already four recorded cases of HIV positive in 2017 based on the DOH 6 data on HIV/AIDS.

For TB, the case detection rate decreased from 90% in 2016 to 52% in 2017 but Treatment Success Rate increased from 91% in 2016 to 99 % in 2017.

In Rabies Prevention Program, one of the identified problems is the increasing cases of animal bites wherein we have 62 recorded animal bite cases and this was due to poor implementation of the Ordinance on Responsible Pet Ownership. However, there was no reported rabies case in this municipality for 2017.

In Dengue Prevention Control Program, dengue case reported was 90 cases due to functional CESRU/MESRU in which the disease is recorded and reported promptly both from the public and private health sectors.

Environmental Sustainability

Households with access to safe drinking water with bacteriological analysis were sustained to 100% due to regular water analysis and monitoring. However, households with access to sanitary toilet increased from 90% in 2016 to 90.20% in 2017, wherein 8 barangays were declared ZOD G1 and 3 barangays were declared ZOD G2. The Sangguniang Bayan of President Roxas has passed a ZOD Ordinance in 3rd Q of 2017.

Non-Communicable Diseases

For Lifestyle-related Diseases, there was an increasing case of hypertension and diabetes. In 2016, Hypertensive patients recorded was 359 but increased to 544 from January 2017 to June 2017. For Diabetes in 2016, recorded cases were only 40 but increased to 47 new cases in 2017, with a total of 88 diabetic patients that were treated and provided with medicines at the RHU in 2017. So for 2017, the prevalence of Diabetes Mellitus was increased to 1.4%. This is attributed to the unhealthy lifestyle of the community and screening of all 25 years old patients that seek treatment to the RHU, and regular TSeKaP services by the RHU staff in the barangay two times a year.

For Mental Health Program, only the MHO, one nurse, and one midwife were trained on MHGAP. Two nurses and one midwife were also trained on Mental Health in Crisis Situation. At present, 11 psychiatric patients were recorded at the RHU. However, RHU lack medicines for psychiatric problems.

For Substance Abuse Program, surrenderers were assessed but facility based rehabilitation program was not implemented due to lack of budget. Only the MHO, two nurses, MSWDO, and representative from the PNP were trained in Substance Abuse and Community-Based Rehabilitation Program.

For National Voluntary Blood Donation Program, the municipality reached the target of 1.12% in 2017 because RHU team conducts IEC and advocacy on the benefits of blood donation during Family Development Sessions in the barangay.

Family Health and Nutrition Program

For the National Immunization Program, the municipality of President Roxas has never reached the national benchmark of 95 percent for the immunization services of children. The performance coverage on immunization services has decreased from 66.94% in 2016 to 59% in 2017. This may be attributed to the increasing contraceptive prevalence rate, presence of geographically isolated and disadvantage area both in coastal and upland barangay and irregular visits of midwives to their catchment areas.

In 2016, 90% of Grade 1 pupils were vaccinated and for Grade 7 students, 87% were vaccinated during the School-based Immunization while in 2017, 94% were vaccinated for Grade 1 pupils while 88% were vaccinated for Grade 7 students.

For Nutrition Program, the nutritional status of children in President Roxas has been improving for the year 2016-2018 because of common strategic focus. The prevalence of wasting for children 0-71 months old has decreased from 4% in 2016, to 1.8% in 2017, to 1.2% in 2018. For stunting, the prevalence also decreased from 24% in 2016 to 11.8% in 2017 to 4.7% in 2018. For wasting, the prevalence was 3.5% in 2016, 4% in 2017 and decreased to 1.3 in 2018. Causes of malnutrition that were identified are parents' lack of appropriate knowledge on food preparation and selection, poor eating habits with wrong kind and amount of food, and poverty bringing about the lack of food on the table.

For maternal Health, President Roxas had prenatal accomplishment of only 59.56% in 2016 which is lower than the national target of 80%. This is due to increasing number of transferred in patients for delivery with incomplete prenatal visits. All pregnant mothers in President Roxas delivered at the Birthing Facility by a skilled attendant. Essential Intrapartum and Newborn Care (EINC) are practiced in the Birthing Facility. Breastfeeding was initiated within one hour in all deliveries at the facility. Postpartum visits were also conducted to all postpartum mothers and which includes counseling on breastfeeding, family planning, personal hygiene, and newborn care. All newborns undergo Newborn Screening Test since the RHU was certified by the DOH as a Newborn Screening Facility.

For Family Planning, Contraceptive Prevalence Rate in 2016 was 91.58% but decreased to 90.67% in 2017 due to exclusion of FP clients who are not a resident of President Roxas. Moreover, there was also an increasing number of defaulters and frequent changing of method of DMPA CU due to painful DMPA of the DOH. And to sustain 90% CPR for 2017, the RHU service provider and NDPs trained in Family Planning conducted a series of Usapan Sessions to couples with unmet need for Family Planning for demand generation.

For Adolescent Health and Development Program, there was an increasing rate of teenage pregnancy in 2017 due to lack of awareness on the risk of early pregnancy.

Disaster Preparedness and Response

The municipality had already developed a comprehensive Disaster Risk Reduction Management Plan for Health which is integrated into the DRRM plan of the municipality. All activities in the DRRMP for Health are coordinated with the MDRRMO.

Oral Health Services

Essential Health Care Program has helped curb dental problems among preschoolers and elementary school children. The EHCP in partnership with the Department of Education provides dental services along with deworming and proper hand washing component. Pregnant mothers are also one of the regular clientele of this program. The municipality allocated budget for the travelling allowance of the Provincial Dentist and Dental Aid for regular dental services in the municipality.

Emerging & Re-emerging Diseases

While continuous surveillance and monitoring as well as safety precautionary measures are being observed at the RHU, the facility lacks holding area to triage suspected cases of emerging & re-emerging diseases and appropriate PPEs are not sufficient.

Health and Wellness for Senior Citizens and Persons with Disability

Priority lanes are provided for the SCs and PWDs. Ramps in the Rural Health Unit and restroom that fits the needs of SCs and PWDs were provided. Comfort Rooms in the labor room and postpartum room were also provided with grab bars for the safety of pregnant, prepartum and postpartum women. The Federation of Senior Citizens in cooperation with the RHU staff conducted medical mission twice a year. All registered PWDS were examined by the municipal health officer at least once a year.

Health Care Financing

To improve financial risk protection, in 2017 the municipality had enrolled a total of 1,000 families while the National Government enrolled 6,204 NHTS families to PHIC. Pregnant women without Phil Health were also enrolled to Phil Health within 24 hours after delivery. Since the RHU is 4-in-1 Phil Health accredited, the reimbursement that we received from the MCP, NCP, and TB DOTS Package helped a lot for the operationalization of the Rural Health Unit especially for procurement of medicines and supplies of the Birthing Facility. However, for the Per Family Payment Reimbursement, the RHU only received P 256,000.00 for 2017.

The municipality has very low budget for health for the past several years (6%) due to partial implementation of Magna Carta for PHWs. The percentage of MOOE allocated to health is 45% which is higher than the national average of 27.25%. However, the percentage of municipal health expenditure in 2017 is 100%.

Health Governance

In 2017, LHB meetings were conducted every quarter only. Program Implementation Review was conducted at the municipality semi-annually.The municipality had allocated budget for the training and incentives of BHWs. The Referral System Manual and the Standard Operating Procedures of the Birthing Facility were used as basis for referral of patients. The RHU staff has a good working relationship with other RHUs and referral hospital.

SDN (Service Delivery Network) in the Province of Capiz or in the ILHZ is not yet established. Although we had our Referral Manual but it is not well implemented.

Health Regulation

Some of the National Health Laws had been adopted by the municipality such as Milk Code, ASIN Law, Smoke-free Ordinance, and Ordinance on Responsible Pet Ownership. But the enforcement and implementations faced the real challenge to the policy and law makers.

To improve access to quality health care facility, the municipality conducted a regular assessment of the facility and complied with Phil Health requirements in order to sustain accreditation to PHIC for PCB1 Package, TB DOTS Package, Maternity Care Package and Newborn Care Package for the past three years.

The RHU has two transport vehicles which are not licensed by the Department of Health.

Health Information System

The municipality has been implementing EMR - iClinicSys, iTIS, and NOSIRS. These helps improve the quality of data. The data generated is timely and reliable and can be used in decision making and development of health. However, internet connectivity is very slow so there is a need to upgrade the internet connection into a Fiber Plan.

Health Human Resource

The municipality has complied with the human resource to population ratio except for the Rural Health Midwives. But some provisions of Magna Carta and Salary Standardization Law (Annex A1) were not implemented. Health care providers experience work overload resulting to conflicting priorities. Seminars and trainings for health care providers were conducted to enhance their knowledge and skills.

The Department of Health deployed six Nurses, three Midwives, one Dentist, one Med. Tech., one Family Health Associate, one Public Health Assistant, and one Universal Health Care Implementor. This DOH-HRH helped a lot in the delivery of health services in the municipality.

Prepared by:

PILAR A. POSADAS, MD
Municipal Health Officer

Appendix M

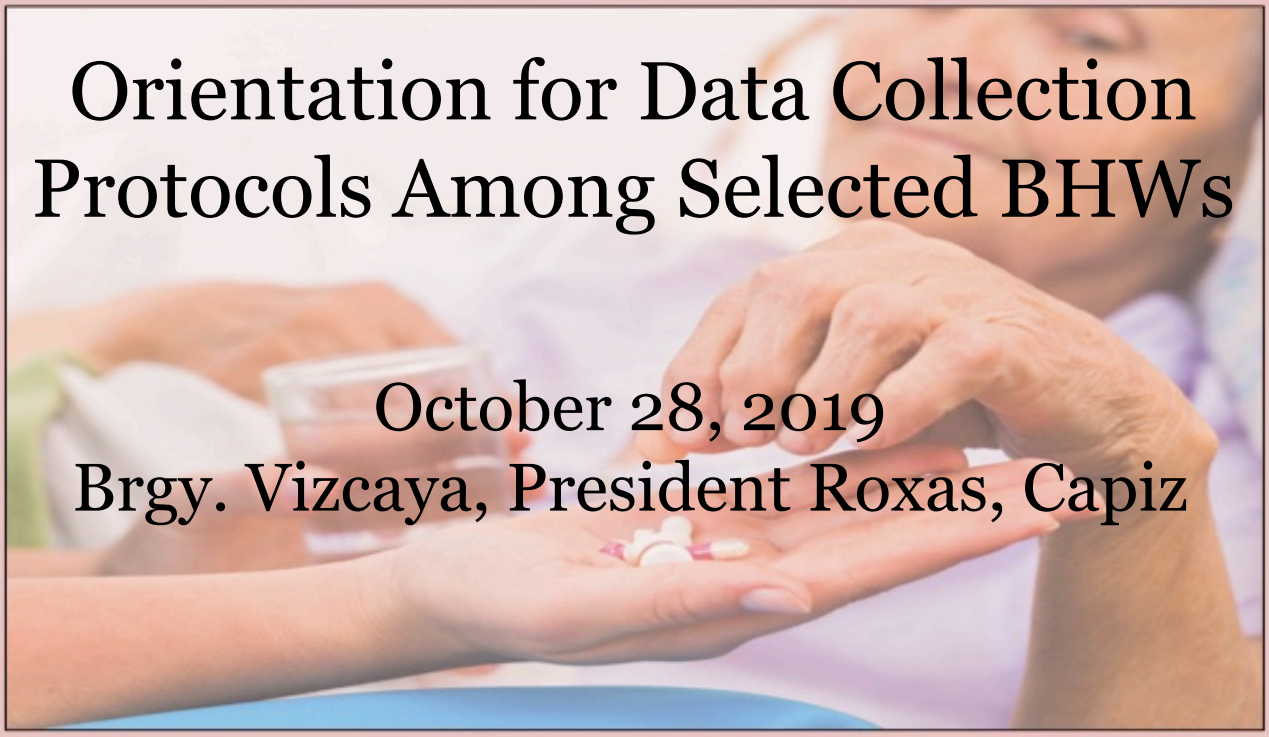
Barangay Health Workers Orientation

ATTENDANCE SHEET

NO.	INTERVIEWEE	LAST NAME, FIRST NAME	TIME	POLE OUT	SCREEN 500 PHP	SIGNATURE
1	1	BALGUD, Melinde	1-40	✓		
2	2	BELONIO, Edina	41-80	✓		
3	3	BILLONES, Leny	81-120	✓		
4	4	CANACHO, Bevelyn	121-160	✓		
5	5	" -lie de Asis	161-200	✓		
6	6	DENOLO, Brenda	201-240	✓		
7	7	I[illegible]DO, Lyn D.	241-280	✓		
8	8	GLENDRO, Geraldine	281-320	✓		
9	9	CABALES, Lota	321-360	✓		
10	10	VILLANUEVA, Annie.	361-400	✓		
11						
12						
13						
14						
15	1	BANGUD, MELINDE		11/3/19	1-40	
16	2	BELONIO, EDENA		11/3/19	41-80	
17	(3)	BILLONES, LENY		11/6/19	081-120	
18	(4)	CANACHO, BEVELYN		11/9/19	121-160	
19	5	DE ASIS, ANALY		11/3/19	161-200	
20	6	DENOLO, BRENDA		11/3/19	201-240	
21	7	FERNANDO, MARILYN D.		11/3/19	241-280	
22	(8)	GLENDRO, GERRYLINE		11/9/19	281-320	
23	9	CABALES, LOTA		11/3/19	321-360	
24	10	VILLANUEVA, ANNIE		11/3/19	361-400	
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University of the Philippines – Open University
Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Orientation for Data Collection Protocols Among Selected BHWs



October 28, 2019
Brgy. Vizcaya, President Roxas, Capiz

University of the Philippines – Open University
Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Ano ang aton mga tinutuyo?

1. Mahibaluan ang mga legalidad sang *survey*.
2. Mahibaluan kung nahanungod sa ano ang *survey*.
3. Maisa-isa ang mga batayan sang pagpili sang mga partisipante nga pwede ilakip kag indi pwede malakip sa *survey*.
4. Mahibaluan ang mga parte sang *survey questionnaire*.
5. Mapraktis ang mga proseso sang paghiwat sang *survey*.
6. Mapraktis ang pag *fill out* sang questionnaire kag lista sang mga partisipante.

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Master of Arts in Nursing Graduate Students

Sin-o ang researcher?



Christian Sandor Badana Ydirin

University of the Philippines – Open University
Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

CHRISTIAN SANDOR BADANA YDIRIN, BSN, R.N., USRN
Home: 800 N Oklahoma Ave, Apt 1331, Oklahoma City OK., USA 73104
Work: Oklahoma University Medical Center 700 NE 13th St., Oklahoma City
Contact No.: +639397366596/+14058378722
E-mail: christiansandor.ydirin@upou.edu.ph



BACKGROUND

A Philippine, Oman and United States of America Registered Nurse, who is currently working as a critical care nurse in an adult intensive care unit utilizing his competent theoretical background in nursing process for managing clients with altered health patterns in emergency and critical situations and his practical experiences as a staff nurse in the post anesthetic care, medical-surgical intensive care, and medical ward units. A research enthusiast, who had an early beginning theoretical foundation in experimental research as a graduate of a DOST accredited Science high school. He also had a background on the basics of nursing research as a BSN degree graduate. Currently, he is an active participant in hospital-based research and working on his nursing masteral thesis entitled, "*Health Promoting Behaviors and Health Literacy of Adults at Risk for Diabetes in a Rural Setting*."

University of the Philippines – Open University
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May pahanugot bala ini?

Oo, may pahanugot halin sa Brgy. Vizcaya, Brgy Captain, Ethics Review Board sang University of the Philippines Open University, abiso sa President Roxas, Municipal Health Officer, *offer letter* para sa napilian nga mga BHWs, kag *consent* sa pag-paambit sang mga partisipante bago magsugod ang survey.

UNIVERSITY OF THE PHILIPPINES
OPEN UNIVERSITY

Office of the Vice Chancellor for Academic Affairs

11 March 2019

ASST. PROF. QUEENIE RIDULME
Program Chair
Master of Arts in Nursing
Faculty of Management and Development Studies
UP Open University
Los Baños, Laguna

Dear Asst. Prof. Ridulme:

The UPOU Research and Publications Committee as per the endorsement of Ms. Ma. Cecilia Punzalan and Dr. Josephine Agapito who served as Ethical Reviewers for the thesis proposal of one UPOU Master of Arts in Nursing student whose name is indicated below is recommending the following action:

Christian Sandor Badana Ydirin: "Health Promoting Behaviors and Health Literacy among Adults at Risk for Diabetes in a Rural Setting"

ACTION: Passed the ethical review and can proceed with her research but have to revise according to the comments made by the reviewers

May we request you to disseminate the said information to the concerned student.

Thank you.

Truly yours,

MELINDA F. LUMANTA
Vice Chancellor and
Chair, Research and Publications Committee

University of the Philippines – Open University
Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Nahanungod sa ano ang survey?

"Mga Binatasan kag Ihibalo Tuhoy sa Pagtib-ong sang Ika-ayong Lawas sang mga Tawo nga may Risgo nga Magka-Dyabetes"

University of the Philippines – Open University
Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Sin-o ang PWEDE malakip sa survey?

- Adults, edad 18-59 años, pumuluyo sang Brgy. Vizcaya.
- Makaintindi sang *Hiligaynon* nga dayalekto.
- Nakapirma sang abiso sa pag-paambit sa *survey* ukon *consent*. Kung indi makasulat, makahatag sang *verbal* na pagpasugot, kag na-*witness* sang BHW.

University of the Philippines – Open University
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Sin-o ang HINDI pwede malakip sa survey?

- Mga nagabusong, gapasuso, kag bag-o bata.
- May malala nga balatian kapareho sang kanser, kag iban pa nga mga may masakit nga nahambalan sang doktor nga indi na magadugay sobra isa ka tuig.
- Mga na-diagnosed na sang doktor nga diabetic kag gatumar bulong para sa diabetes ukon gagamit insulin.
- May sakit sa panghuna-huna ukon paminsaron.

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May apat (4) ka parte ang survey:

1. Consent Form (page 1)
2. Demographics Survey (page 2)
3. Health Behavior Survey (page 3-5)
4. Health Literacy Survey (page 6).

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Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Ano ang consent form?

- Pagapirmahan sang partisipante simbolo sang pagpasugot nga mag pa-survey.
- Pagpasalig nga konpidensyal kag pagatuguon ang ila impormasyon.

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Part 1: Ano ang Demographic Survey?

1. Edad
2. Sex
3. Civil status
4. Level sang edukasyon
5. Employment
6. Health status
7. Health insurance
8. Family structure
9. Monthly income
10. Beses sang pagbisita sa doktor sa 1 ka tuig
11. High BP History
12. Diabetes Family History
13. High Blood Sugar History
14. Waist circumference

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Part 2: Ano ang Health Behavior Survey?

- 52 ka mga pamangkutanon.
- Tuhoy sa mga binatasan sa pagtib-ong sang ika-ayong lawas.
- Pwede masabat pamaagi sang apat ka mga paga-pilian: *Wala gid, Talagsa, Pirmi,* ukon *Pirmi-pirmi gid*.

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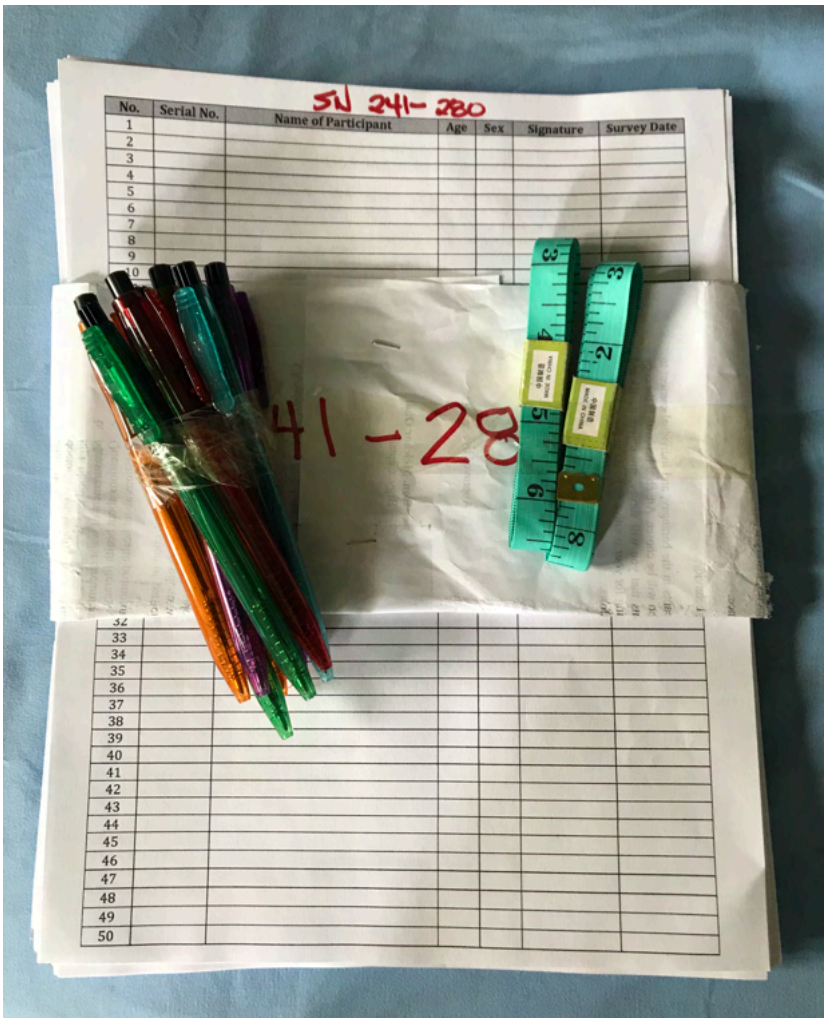
Part 3: Ano ang Health Literacy Survey?

- 12 ka mga pamangkutanon.
- Tuhoy sa mga ihibalo nahanungod sa ika-ayong lawas.
- Pwede masabat sa pamaagi sang apat ka mga pagapilian: *Sobra kabudlay, Mabudlay, Mahapos*, ukon *Sobra Kahapos*.

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Ano ang mga kinahanglan sa pag survey?

- Survey questionnaires (40).
- Ballpens (9).
- Tape measure (2).
- *Dole out* nga inughatag sa mga partisipante (40 pcs).



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Ano ang (8) ka proseso sang pag-survey?

1. READY. Siguraduhon nga kumpleto ang mga gamit bag-o magsugod bisita tagsa ka balay.

2. ID. Ang participant ID number, interviewer ID number, kag zone number dapat paga-kumpletuhon bago suguran ang survey.

   A. Participant ID number: 1, 2, 3, 4... 400.
   B. Interviewer ID number: 1, 2, 3, 4, ... 10
   C. Zone number: 1, 2, 3, 4, 5, 6, 7

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Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Ano ang participant ID no?

1. 001, 002, 003, 004, 005... to 040
2. 041, 042, 043, 044, 045... to 080
3. 081, 082, 083, 084, 085... to 120
4. 121, 122, 123, 124, 125.... to 160
5. 161, 162, 163, 164, 165... to 200
6. 201, 202, 203, 204, 205... to 240
7. 241, 242, 243, 244, 245... to 280
8. 281, 282, 283, 284, 285.. to 320
9. 321, 322, 323, 324, 325... to 360
10. 361, 362, 363, 364, 365... to 400

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Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Ano ang Interviewer ID No?

1. Melinde Bangud (**ID No. 1**)
2. Edina Belonio (**ID No. 2**)
3. Leny Billones (**ID No. 3**)
4. Bevelyn G. Camacho (**ID No. 4**)
5. Analie de Asis (**ID No. 5**)
6. Brenda Denolo (**ID No. 6**)
7. Lyn D. Fernando (**ID No. 7**)
8. Geraldine Glendro (**ID No. 8**)
9. Lota Cabales (**ID No. 9**)
10. Annie Villanueva (**ID No. 10**)

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Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Ano ang ZONE number?

1. Bungyod (Zone 1) (1 BHW)
2. Catipayan (Zone 2) (1 BHW)
3. Hanglid (Zone 3) (1 BHW)
4. Liboo (Zone 4) (1 BHW)
5. Lunok (Zone 5) (1 BHW)
6. Pantalan (Zone 6) (2 BHWs)
7. Viz. Proper (Zone 7) (3 BHWs)

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Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Ano ang (8) proseso sang pag-survey?

3. KNOCK. Magpanuktok, magpanagbalay, kag maghalong sa mga ido. Kung wala tawo ang tag-balay, mahimo nga ubrahon magbalik duwa ka beses sa nalain nga tyempo, kapareho sang timprano sa aga, ukon sa *late* sa hapon.

4. CONSENT. Magpakilala, ipakita ang abiso halin sa Brgy. Captain kag magpangayu sang *consent* sa pagsurvey.

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Faculty of Management and Development Studies
Master of Arts in Nursing Graduate Students

Ano ang (8) proseso sang pag-survey?

5. CONFIDENTIAL. Magpasalig sa mga partisipante nga ang mga impormasyon nga ila igahatag pagataguon kag konpidensyal.

6. READ & CHECK. Pagabasahon ang tagsa ka pamangkot, kag ang mga pagapilian nga sabat. Ang tanan nga sabat mahimo nga markahan sang dako nga tsek (✔) ang ***box*** sang sabat sang partisipante, maliban sa edad nga dapat isulat, sa gilid sang edad: _____.

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Master of Arts in Nursing Graduate Students

Ano ang (8) proseso sang pag-survey?

6. WAIST CIRCUMFERENCE. Ang tama nga pagsukat sang hawak. (video).

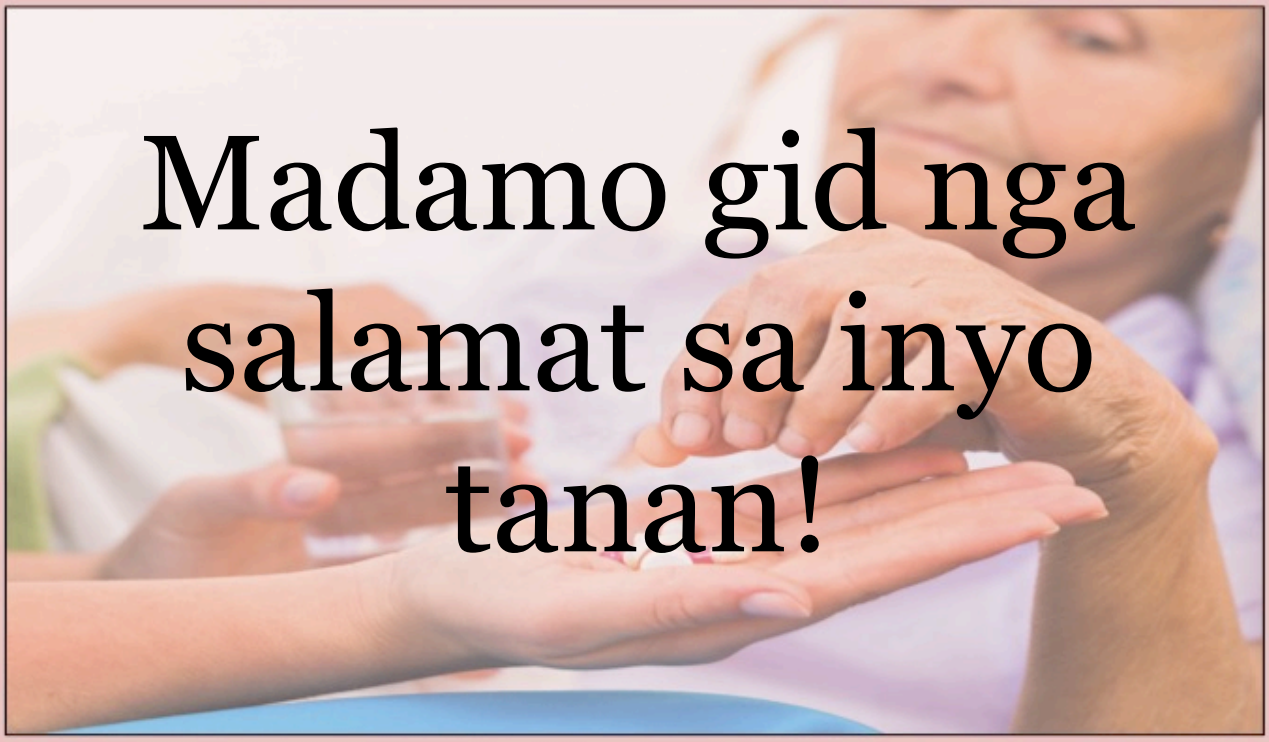
7. RECHECK. Pagasiguraduhon nga tanan nga palamangkutanon na sabat sang kumpleto pagkatapos sang survey.

8. THANK YOU. Magpasalamat kag ihatag ang gamay nga *dole out* para sa tyempo nga gin-hatag sang partisipante.

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May mga pamangkot bala kamo?

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Appendix N

Documentation Photos



Image 1. THE RESEARCHER. All set for the venue of BHW data collection protocol orientation last October 28, 2019.



Image 2. THE VENUE. The place for BHWs orientation at the researcher's residence in Brgy. Vizcaya, President Roxas, Capiz.



Image 3. LECTURE PROPER. In-depth orientation about the data collection procedures to be carried out during the survey.


Image 4. SKILLS TRAINING. The BHWs during the demonstration and return demonstration of the proper way of measuring waist circumference.



Image 5. INTERVIEWING SKILLS. The BHWs practicing the use of data collection tool among themselves.



Image 6. POST ORIENTATION. The researcher with all the 10 BHWs recruited for the data collection after the orientation and skills training.



Image 7. ON SITE EVALUATION. The researcher on site, evaluating and monitoring how BHWs conduct the data collection procedures.



Image 8. UPHILL TREK. The researcher together with the BHWs trekking the upslope of one of the Sitios in Brgy. Vizcaya, President Roxas, Capiz.



Image 9. ZONES. Sitio Hanglid, one of the zone of Brgy Vizcaya, where the research was conducted.



Image 10. ZONES. Road going to the three zones included in the conduct of the survey, Sitios Bungyod, Libo-o and Katipayan.



Image 11. ZONES. Sitio Pantalan, one of the zone of Brgy. Vizcaya, where the research was conducted.


Image 12. ZONES. Sitio Lunok, one of the farthest and most upland zone of Brgy. Vizcaya, where the research was conducted.



Image 13. TURNING OVER. Return of survey questionnaires. The researcher checking the completeness of the questionnaires upon being turned over by some BHWs on November 3, 2019.



Image 14. DOLE OUTS. Several packs of goods in kind to be given to respondents who were randomly selected as participants in the study.

Appendix O

Curriculum Vitae



CHRISTIAN SANDOR BADANA YDIRIN, BSN, R.N., US RN
Home: 800 N Oklahoma Ave, Oklahoma City, OK, 73104
Work: OU Medical Center, 700 NE 13th St., Oklahoma City, OK, USA
Contact No.:
E-mail: christiansandor.ydirin@upou.edu.ph

BACKGROUND

A Philippines and United States of America Registered Nurse, who is currently working as a critical care nurse in an adult intensive care unit utilizing his competent theoretical background in nursing process for managing clients with altered health patterns in emergency and critical situations and his practical experiences as a staff nurse in the post anesthetic care, medical-surgical intensive care, and medical ward units. A research enthusiast, who had an early beginning theoretical foundation in experimental research as a graduate of a DOST accredited Science high school. He also had a background on the basics of nursing research as a BSN degree graduate. Currently, he had his successful final oral thesis defense entitled, "*Health Literacy and Health Promoting Behaviors of Adults at Risk for Diabetes in a Rural Barangay in Capiz*."

RESEARCH RELATED EXPERIENCE

November 2011	**Presentor;** presented abstract poster presentation during the First Sultan Qaboos University International Nursing Conference entitled, "*The Impact of Red &Yellow Infection Control Guidelines on the CLABSI Rates of an ICU in a Tertiary Hospital in Oman*."
June 2006-April 2007	**Co-researcher**; conducted a qualitative descriptive research, entitled, "*Perceived Personal and Social Relevance of Adult & Sexual Health Education Among Adolescents in a Barangay in Concepcion, Iloilo*."
June 2002-April 2003	**Principal researcher**; conducted an experimental study that was nominated as one of the three best researches for Regional INTEL Philippine Science Fair in Region VI, entitled, "*Extraction of Chitosan from Crabshells and its Effect on Developing Tomato Plant's Resistance (Lycopersicon esculentum) Against Root-Knot Nematodes (Meloidogyne spp.) Infestation*.
June 2001-April 2002	**Principal researcher**; led a group of high school students who worked on an experimental research, entitled, "*The Effects of Castor Seeds (Ricinus Communis) on the Mortality of Black Rats (Rattus rattus)*.

PROFESSIONAL NURSING EXPERIENCE

March 2018- Present **Cardiac Intensive Care Unit Registered Nurse**
Oklahoma University Medical Center
700 NE 13th St., Oklahoma City, OK, USA

- Currently working as a USA Registered Nurse in cardiac intensive surgical unit of a Joint Commission International (JCI) accredited, 350+ plus bed capacity tertiary teaching hospital.

August 2010- January 2018 **Adult Health Critical Care Nurse**
Sultan Qaboos University Hospital
Alkhod St., Muscat, Sultanate of Oman

- Worked as a bedside staff nurse in an adult intensive care unit of a British Standards Institution (BSI) International Standard Organization (ISO) 9001 and Accreditation Canada International (ACI) certified, 480 plus bed capacity tertiary hospital.
- Rated as proficient to expert in overall annual performance grading through the hospital's competency based performance appraisal from August 2010 to present.
- Participates in the conduct of research and key processes interventions of the unit.
- Assigned as an infection control link nurse from 2010 to 2013 of the intensive care unit.
- Contributes to the unit level management processes like supporting JCI and/or ACI accreditation.
- Initiated the production of instructional posters depicting taking and transporting samples for cases of suspected Novel Corona Virus (MERS-COV) in July 2013.
- Contributed to designing the new blood stream infection data collection tool in 2011.
- Designed the patient and family education brochure for preventing falls in the hospital in 2014.
- Delivered lecture discussion about head trauma injury, permissive hypercapnea in 2013 and multi-drug resistant organisms & infection control in 2012.

January 2008- July 2010 **Surgical Intensive/Post Anesthetic Care Nurse**
Iloilo Doctors' Hospital, Inc.
West Avenue, Molo, Iloilo City, Philippines

- Worked as a staff nurse and team leader in a Surgical Intensive Care Unit/Post Anesthetic Care Unit of an ISO 9001:2000 certified 300-bed capacity tertiary hospital.

PERSONAL INFORMATION

Age: 33 years old
Civil Status: Single
Citizenship: Filipino
Sex: Male
Weight: 69 kg
Height: 5'6"

EDUCATION

2014-Present **Master of Arts in Nursing,** candidate
Major in Adult Health Nursing
University of the Philippines Open University
Los Banos, Philippines

2003-2007 **Bachelor of Science in Nursing**
West Visayas State University, La Paz, Iloilo City, Philippines
Cumlaude

CERTIFICATIONS & MEMBERSHIP

April 2011 **US Registered Nurse**, National Council Licensure Examination for Registered Nurses, National Council of State Boards of Nursing

June 2007 **Registered Nurse**, 83.4% General Average
Philippine Nurse Licensure Examination,
Professional Regulations Commission, Board of Nursing, Philippines

CHARACTER REFERENCES

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Oklahoma University Medical Center
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