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VIE MARK A. VENTURINA, RN

**UTILIZING PENDER’S HEALTH PROMOTION MODEL TO ASSESS HEALTH
RISKS AMONG FIREFIGHTERS IN BULACAN, PHILIPPINES**

Thesis Adviser:

ASST. PROF. RITA C. RAMOS
Faculty of Management and Development Studies

29 March 2025

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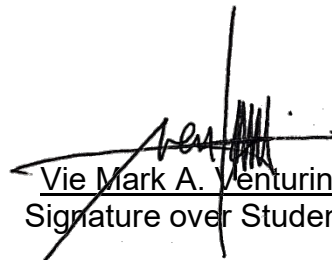
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Acceptance Page


This Thesis/Dissertation of **VIE MARK A. VENTURINA** titled: "**UTILIZING PENDER'S HEALTH PROMOTION MODEL TO ASSESS HEALTH RISKS AMONG FIREFIGHTERS IN BULACAN, PHILIPPINES**" is hereby accepted by the Faculty of Management and Development Studies, U.P. Open University, in partial fulfillment of the requirements for the degree **Master of Arts in Nursing**.


ASST. PROF. RITA C. RAMOS
Chair, Advisory Committee

05/03/2025
Date


ASST. PROF. RIA VALERIE D. CABANES
Critic, Advisory Committee

13 May 2025
Date


ASST. PROF. QUEENIE R. RIDULME
Member, Advisory Committee

13 May 2025
Date


ASST. PROF. ARNOLD B. PERALTA
Member, Advisory Committee

03 May 2025
Date


ASST. PROF. REGINE KARLA P. BAGALANON
Member, Advisory Committee

13 May 2025
Date


FINAFLOR F. TAYLAN, DPROFST
Dean
Faculty of Management and Development Studies

20 May 2025
(Date)

Biographical Sketch

Vie Mark Adriano Venturina, born on September 3, 1988, is a dedicated professional with a diverse background in both public service and academe. He has built a career that reflects his commitment to safety, education, and personal development.

Vie Mark earned a Bachelor of Science in Nursing from STI College – Sta. Maria in April 2009, which has been crucial in shaping his career. He is currently pursuing a Master of Arts in Nursing, Major in Adult Health Nursing, at the University of the Philippines – Open University, demonstrating his commitment to broadening his knowledge and advancing his skills.

Since December 2009, Vie Mark has served the Bureau of Fire Protection (BFP) in Region III and currently with a rank as a Senior Fire Officer 1, specializing in fire safety and education, emergency response, and medical services. He is skilled in both administrative and operational procedures, making him an asset to his department and community. Additionally, from June 2017 to March 2019, he worked part-time as a Senior High School Instructor, teaching Disaster Risk Reduction, Practical Research, and other related subjects, sharing his knowledge and expertise on emergency management with students.

He is not only a dedicated professional but also a licensed nurse and licensed real estate broker under Professional Regulation Commission of the Philippines, further showcasing his versatility and commitment to expanding his skill set. His career reflects a deep-seated desire to help others, whether through life-saving fire safety efforts, medical assistance, academe, or his work in real estate.

Acknowledgement

First and foremost, I would like to express my sincerest gratitude to God Almighty for His unwavering guidance and blessings throughout the entire research process.

I am deeply grateful to the Bureau of Fire Protection (BFP) Bulacan, headed by FSSUPT ERNESTO S PAGDANGANAN and FCINSP MARICHELLE M COLLADO, for their gracious approval and support in conducting this study among the men and women of the BFP Bulacan. My sincere thanks also go to all of the BFP-Bulacan's City/Municipal Fire Marshals, and to the Provincial Chief Emergency Medical Services and all BFP Bulacan Fire Station's Chief Emergency Medical Services for their invaluable assistance and cooperation.

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I would like to express my deepest gratitude to my parents for their unwavering love, support, and encouragement throughout my academic journey. Their sacrifices and belief in me have been the driving force behind all my accomplishments.

Finally, to all of the people surrounding me, to all of my friends, colleagues, and Liam, who continue to motivate and inspire me to do more and be better, thank you very much.

This research would not have been possible without the support and contributions of these individuals and organizations. I am eternally grateful for their kindness and dedication.

Dedication

This thesis is dedicated to the people and institutions that have played an integral role in shaping this research and in making it possible.

First and foremost, to my beloved family and friends, whose love, guidance, and support have been my foundation throughout this academic journey. Your unwavering belief in me has inspired me to strive for excellence and to never give up, even during the most challenging times. You have always been my source of strength, and this accomplishment is as much yours as it is mine.

To the institution of the Bureau of Fire Protection (BFP) Bulacan, I extend my deepest gratitude. The cooperation, insight, and resources you provided have been invaluable to the completion of this study. Your dedication to safeguarding the lives of firefighters and ensuring their well-being has been a motivating factor in conducting this research. It is my hope that the findings of this study will contribute in some way to enhancing the health and safety measures within our esteemed organization.

Lastly, this research is dedicated to the nursing profession, which has inspired me and provided the framework to address health concerns through a holistic and compassionate approach. Nursing practice is at the heart of this study, and it is through the lens of nursing care that this research seeks to identify ways to better serve and protect the health of our firefighters. I dedicate this work to all healthcare professionals who, through their practice, continuously work toward improving the lives of others.

In acknowledging these pivotal influences, I humbly present this thesis as a tribute to all who have supported and guided me throughout this process. Your contributions have been indispensable, and I am deeply grateful for each of you.

Abstract

This study aimed to investigate the health status and health-promoting lifestyle practices of firefighters in Bulacan. Employing a descriptive-correlational design, data were collected from 493 personnel of the Bureau of Fire Protection (BFP) across 24 fire stations within the province. Participants included firefighters from 20 municipalities, 4 cities, and the Provincial Office. Data collection involved the administration of a self-administered questionnaire encompassing demographic information, health-related characteristics, and the Health-Promoting Lifestyle Profile (HPLP).

The results indicated that 69.8% of the respondents were male, 58.0% were married, and 93.9% had attained a college degree. as all participants were degree holders, meeting BFP's qualification requirement. Health assessments revealed a significant proportion of participants with elevated blood pressure (54.0%), and a smaller subset categorized as hypertensive (13.0%). Body Mass Index (BMI) data indicated that 47.5% of respondents were within the normal weight range, while 39.6% were classified as pre-obese. The study also revealed that the majority (77.3%) exhibited a high waist-hip ratio. Despite these health risks, the participants perceived their health as generally good.

Respondents reported a generally positive perception of their health, with 47.5% rating it as very good and 26.8% as good. The study further analyzed the participants' health behaviors, with a moderate average Health-Promoting Lifestyle Profile (HPLP) score of 141.01.

The findings indicate that perceived health status has weak but significant correlations with age, length of fire service, and HPLP II and its subscales. Specifically,

age is weakly correlated with perceived health status, HPLP II, and several subscales, including stress management, nutrition, and physical activity. The strongest relationship was between age and length of fire service ($r = 0.867, p < 0.01$). Length of fire service shows weak significant correlations with perceived health status and HPLP II physical activity. Additionally, the HPLP II itself has a weak but significant correlation with age and perceived health status, while it shows very strong significant correlations with all six of its subscales (stress management, interpersonal relations, nutrition, physical activity, spiritual growth, and health responsibility).

Keywords: Health Risks, Health Promotion, Nursing, Firefighters

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Chapter I

THE RESEARCH PROBLEM

Background of the Study

Firefighters' burning courage endanger their life and health to fulfill their duties and responsibilities (Payne, 2019). Firefighters risk their lives by being exposed to smoke and other pollutants, extreme heat, and stress. They also confront risks related to their use of personal protective equipment, the safety of their vehicles, and their own health. Each time they enter the fire station, firefighters put their health at danger. Although they get extensive training to assist them respond to a variety of events as securely as possible, firemen frequently neglect taking precautions that may help safeguard their own health.

In the United States, firefighters take on the role of first responders during domestic crises, emergencies, and natural disasters, as noted by Kaipust (2018). Studies have indicated that firefighters are susceptible to occupational stress and mental health issues, however, research on the specific organizational hazards they encounter is limited (Muegge, 2020). Identifying the workplace factors that significantly impact their well-being is crucial (Payne & Kinman, 2019; Makara-Studzińska et al., 2019). Firefighters are routinely exposed to carcinogens, toxins, and other risk factors for cancer and heart disease. Research findings suggest a higher prevalence of aero-digestive and genitourinary cancers among firefighters compared to the general population. However, research on increased cardiovascular mortality remains inconclusive (Muegge, 2020; Palmer & Yoos, 2019). At the local level, there's a significant gap in our understanding of the prevalence of chronic diseases, risk factors,

and barriers to healthy lifestyles among firefighters (Muegge, 2020).

In the second semester accomplishment report of the Bureau of Fire Protection (BFP) – Health Service, Hypertension is the leading illness amongst firefighters within the bureau for the second semester year 2022 followed by Diabetes Mellitus and Hypercholesterolemia. According to the Philippine Statistics Authority's preliminary 2022 data on causes of death, ischemic heart diseases, cerebrovascular diseases, and neoplasms emerged as the leading causes of mortality in the Philippines from January to July 2022. As to the fact that they were also the top three causes of death at the same time in 2021. Ischemic heart diseases were the leading cause of death in the Philippines from January to July 2022, accounting for 57,899 fatalities, or 18.6% of all deaths during that period. Hypertensive diseases, the fifth leading cause of death, resulted in 17,999 fatalities (5.8%), while diabetes mellitus, the fourth leading cause, contributed to 20,107 deaths (6.4%).

Among all other professions in the Philippines, who were working under extreme job nature, firefighters were left behind when it comes to research studies as proponents. Further, this study explores the possible improvement of health by developing a specific and definitive fitness program for the firefighters. Firefighting demands both mental and physical strength – sustained focus and significant muscular endurance are critical (Payne, 2019). To support this, well-structured fitness programs are essential. Since 2013, there's only Physical Fitness test for firefighters in which they must comply on doing the exercises such as push-ups, sit-ups, and running. In 2024, the BFP created a bi-annual medical profiling which measures the health of firefighters by doing laboratory tests, ECG, and X-ray and they also started a weight management program wherein overweight personnel are advised to go on

diet and report their progress to the health service. However, there is lack in monitoring and implementation in the personnel level in every stations. Also, these programs must be tailored to the specific physical demands of firefighting, considering the diverse needs of individual firefighters.

Thereby looking into the current health promoting behavior of the firefighters that might be influenced by their present and/or previous life experiences, frequency of similar behavior, and individual traits encompassing psychological, biological, and socio-cultural aspects. As a result, these factors can have significant direct or indirect effects on an individual's engagement in health-promoting activities. These factors can directly influence firefighters' perceptions regarding the benefits and barriers associated with health-promoting behaviors, as well as their perceived self-efficacy. Interpersonal and situational factors also contribute to these perceptions. Based on these perceptions and influences, firefighters may develop a commitment to a plan of action, leading to the implementation of personal health behaviors. Ultimately, this can contribute to positive health outcomes, including productive living, optimal well-being, and personal fulfillment.

In the 2004 film "Ladder 49," Chief Kennedy succinctly describes the essence of a firefighter's role: "People always ask me how it is that firefighters run into a burning building when everyone else is running out. Courage is the answer." (Ladder 49, 2004). This courage, a cornerstone of the firefighting profession, directly impacts public safety and the well-being of firefighters themselves. If health-promoting behaviors negatively affect a firefighter's health, it could potentially compromise their ability to effectively serve the public and ensure their own safety. Thus, in fire service in the Philippines specifically personnel of Bureau of Fire Protection experiences

health related illnesses either in-service or as soon as they retire from service either compulsory at the age of 56 or after optional retirement if may warrant. This study, in connection with the above facts, will explore and identify the health risk amongst firefighters on Bulacan as they perform their mandated duties and responsibilities.

Health promotion has emerged as a critical component in improving overall health outcomes. While numerous studies emphasized its significance, research on factors influencing individuals' engagement in health-promoting activities remains limited. The Health Promotion Model (HPM) developed by Pender offers a thorough framework for comprehending these factors. By applying the HPM to the specific context of firefighters in Bulacan, this study aims to identify key health risks and develop targeted interventions to promote healthy lifestyles among this high-risk population. This research plays a crucial role in advancing our knowledge of health promotion and provides a foundation for developing evidence-based interventions to improve the health and well-being of firefighters.

Existing literature primarily addresses the health challenges faced by firefighters in developed countries, potentially overlooking the unique circumstances and risk factors prevalent in developing nations. Moreover, the specific health risks and influencing factors among Filipino firefighters, especially those in Bulacan, remain under-explored. This study aims to bridge this knowledge gap by investigating the health risks faced by firefighters in Bulacan and identifying the factors contributing to these risks. By applying Pender's Health Promotion Model, this research seeks to understand the health-related behaviors and perceptions of firefighters, providing valuable insights for developing targeted health promotion interventions.

Statement of the Problem

A firefighter must be fit to combat the demands of their jobs and efficiently perform their duties and responsibilities. Lack of health promoting activities and unfavorable health promotion behavior can be detrimental to one's individual health. Health and individual characteristics and experiences may affect decisions and choices in performing health promoting behavior. By this study, applying the Health Promotion Model of Nola Pender will identify the health risks amongst firefighters in Bulacan through self-evaluation. Further, identify the relationship of their individual firefighter characteristics and experiences to the perceived health risks; and to determine its implications to nursing practice and cues to action in attaining wellness.

In the duration of this research study, the researcher seeks answers to the following research questions as it briefly defines and provide solutions to the research problem of this research study:

- 1) What is the demographic profile of firefighters in Bulacan in terms of:
 - i) Age
 - ii) Sex
 - iii) Body Mass Index [BMI]
 - iv) Waist Hip Ratio [WHR]
 - v) Blood Pressure
 - vi) Marital Status
 - vii) Perceived Health Status
 - viii) Educational Attainment
 - ix) Length of Fire Service

- 2) What is the relationship between the Individual Characteristics and Experiences (Perceived Health Status) and health risks (Health Responsibility) of the firefighters in Bulacan?
- 3) What are the health risks level of Filipino firefighters in Bulacan in terms of: Health Responsibility, Physical Activity, Nutrition, Spiritual Growth, Interpersonal Relations, Stress Management?
- 4) What are the health risks level of Filipino firefighters in Bulacan in terms of: Health Responsibility, Physical Activity, Nutrition, Spiritual Growth, Interpersonal Relations, Stress Management?
- 5) What are the implications to nursing practice of the Individual Characteristics and Experiences of the firefighters in Bulacan; their health risks and the Behavior-Specific Cognition and Affect towards Behavioral Outcome in health promotion?

Significance of the Study

Firefighting always demands peak performance. Given the nature of the job, transitioning from rest to intense physical exertion can place significant physical and emotional strain on individuals. Thus, understanding the effects to the firefighters of their health promoting behaviors based on their perception of health and individual characteristics and experiences provide relevant information on how to improve the health of fellow firefighters. Taking advantage of the data gathered may influence and contribute to the perceptions of the respondents but also be applicable to other firefighters nationwide.

Identifying, comparing, and correlating the specific firefighter individual

characteristics and experiences to the health promoting behavior will derive relevant information to improve the welfare of the Filipino firefighters not only in Bulacan but also in Philippines per se.

For the Firefighters

This study will generate baseline data on the health and well-being of Filipino firefighters residing in Bulacan. The behavior-specific cognitions, and individual experiences and characteristics will establish a baseline data that can be used as a basis for future health programs including their current health status and presence of chronic illness. Identification of health risk presence will create awareness and health consciousness. Thus, the probability of development of fitness programs will provide benefits for the respondents for them to maximize functional independence by improving health promoting behavior while performing tasks.

For the Nursing Practice

The application of the Pender's Health Promotion Model will generate theoretically bounded conclusions and recommendations for enhancing nursing practice, specifically firefighters including other emergency personnel. The involvement of uniformed personnel nurses in the health promotion and management of the firefighters will be exercised and maximized.

For the Organization

The gathered information from the respondents can be used to establish baseline data about health records of the BFP's personnel. Further, this will serve as a basis in future development of other health programs. This study will offer an initial baseline of the participants' current health conditions. In addition, probable

development of fitness programs will turn out to be beneficial in improving the delivery of fire service within the locality.

For the Students and Researchers

Firefighters in the Philippines are rarely the sole respondents of a certain study. There is a limited or almost no published study pertaining to firefighters specifically health promotion of the Filipino firefighters. This study aims to generate baseline research and encourage future research to tackle the firefighters here in the Philippines. May this research create awareness among students and researchers that formulating specific research per occupation and generate specific programs particular to the constituents of the certain organization. Furthermore, this research can serve as a valuable resource for other professionals in their future endeavors.

Scope and Limitation of the Study

This research study focused on the health conditions and health-promoting behaviors of active firefighters within the province of Bulacan, Philippines. The scope of this investigation encompassed all fire stations and offices within Bulacan, including the provincial headquarters, covering 24 municipalities and cities operated by the Bureau of Fire Protection (BFP). The study specifically targeted the BFP personnel, who are all Filipino professionals, aiming to describe their health status and the influence of their health-promoting behaviors on their overall wellness. The unique context of Bulacan, adjacent to the National Capital Region (NCR) and experiencing rapid urbanization, was considered, as it contributes to the heavy workload and service demands placed on the BFP personnel. Furthermore, the significant contribution of

BFP-Bulacan to the manpower of Central Luzon's fire services underscored the importance of this localized study.

This study is subject to several limitations such as; the findings are geographically limited to the province of Bulacan and may not be representative of firefighters in other regions of the Philippines, including Region 3 (Central Luzon), or the national level. The unique socio-demographic and environmental factors of Bulacan, such as its proximity to NCR and the pressures of urbanization, may influence the health conditions and behaviors of its firefighters in ways that are not applicable elsewhere. Secondly, the study focused exclusively on active BFP personnel, excluding retired firefighters or those from other agencies. Therefore, the results cannot be generalized beyond this specific population.

The study's design and sampling methodology impose further limitations. While a multi-stage sampling technique was utilized to obtain a representative sample of the 542 active BFP personnel in Bulacan, achieving a statistical power of 80% with a 20% margin of error, the inherent limitations of sampling remain. Consequently, the findings of this study should be interpreted within the context of these limitations, recognizing that they specifically describe the health conditions and behaviors of firefighters within the defined geographical and population parameters of Bulacan.

Chapter II

THEORETICAL BACKGROUND

Review of Literature

Scientific evidence indicates that the aging process typically commences around the age of 40. At this stage, both underlying genetic predispositions and external factors stemming from lifestyle and environmental stressors can contribute to the development of various diseases and disorders. Regular health monitoring becomes crucial at this point to prevent, manage, or delay the progression of these conditions. While previous research has primarily focused on the health challenges faced by firefighters in developed countries, it often overlooks the unique conditions and risk factors prevalent in developing nations. This study employs Pender's Health Promotion Model to examine and understand the health-related behaviors and attitudes of firefighters.

Firefighter and Health

Tommasi et al. (2020) cited Carlier et al. (1997) that workplace stress is often higher for emergency personnel than for non-emergency personnel. According to Chae et al. (2012) as cited by Woo-Hyuk et al. (2019), the role of firefighters has evolved significantly. While traditionally focused on fire-related duties such as prevention, precaution, and suppression, their responsibilities have expanded considerably. In contemporary society, firefighters are increasingly involved in a wider range of safety-related incidents nationwide, including rescue and emergency services.

Professional groups that are subject to high levels of stress include firefighters according to Makara-Studzińska (2019); such professional groups may be subjected to traumatic situations as well as long-term stress, according to earlier studies. In rendering their duties, Tommasi et al. (2020) stated that firefighters must deal with several very risky situations. They may suffer burns, carbon monoxide poisoning, car accidents, or being struck by falling down homes. Additionally, they may be exposed to combustible chemicals that have a high risk of exploding and must handle hazardous tools like saws or clippers. For firemen, the danger of fatalities or serious injuries is exceedingly great. Muegge's (2020) research found that cardiovascular risk factors in firefighters began to increase significantly early in their careers. Within five years of service, newly hired firefighters experienced notable elevations in BMI (Body Mass Index), total cholesterol, LDL cholesterol, and triglyceride levels. Concurrently, HDL cholesterol levels decreased considerably. This trend of deteriorating cardiovascular health continued throughout their firefighting careers, with a sustained decline in these crucial health markers observed by the tenth year of employment.

Despite engaging in physically demanding work that occasionally precedes periods of relative inactivity, Palmer & Yoos (2019) cited Banes (2014); and Poston et al. (2011). Studies have shown elevated rates of fatal cardiovascular events among emergency medical technicians (13%), police officers (11%), and construction workers (22%). Similarly, Duran et al. (2018), citing Bos et al. (2004) and Murphy et al. (2002), highlight that firefighters face a unique set of stressors related to their work, including fatigue, sleep deprivation, and time pressure. These stressors can significantly impact their physical and emotional well-being, often requiring them to make critical decisions under immense pressure while potentially facing personal harm or witnessing the

suffering of others. From their interviews, it is evident that the firemen dealt with a variety of pressures both at work and outside of it, which had a detrimental effect on their physical and emotional health.

Firefighter's Morbidity and Comorbidity

Jahnke et al. (2017) identified several significant health concerns among firefighters, including an increased risk of cancer, cardiovascular disease, and injuries. According to data, a variety of occupational risk factors put firemen at higher risk for poor health, various illnesses, and early mortality. Obesity, poor diet, insufficient physical activity, excessive drinking, use of smokeless tobacco, insufficient sleep, and behavioral health issues are among the underlying modifiable risk factors that have emerged as having a critical role in raising chances for ill health. To improve occupational health among this crucial demographic, it is essential to comprehend these hazards and use preventative and intervention strategies.

The fire service faces a significant challenge with overweight and obesity, with prevalence rates exceeding those observed in the general UK population, as highlighted by Lessons & Bhakta (2020). Exposure to intense heat, which can impair vascular function, coupled with an obesogenic environment often prevalent in fire stations, significantly increases the risk of acute myocardial infarction (MI) among firefighters. Palmer & Yoos (2019) identified several contributing factors, including age, gender, and family history of cardiovascular disease. Modifiable risk factors include diabetes, hypertension, high cholesterol, high triglycerides, and obesity. Furthermore, alcohol and tobacco use, as noted by Yang et al. (2013) as cited by Palmer & Yoos (2019), are significant behavioral factors linked to sudden cardiac death and heart disease. This combination of risk factors, coupled with the physical

demands of the job, including handling heavy equipment and wearing heavy personal protective equipment (PPE) weighing between 44 and 50 pounds, significantly increases the risk of sudden cardiac death among firefighters (Banes, 2014; Farioli et al., 2014).

Firefighters may face an increased risk of cardiovascular disease compared to the general population due to the inherent dangers of their profession. These dangers include exposure to burns, physical injuries, air pollution, and significant physical and mental stress, as well as the demands of shift work, as noted by Romanidou et al. (2020). Sudden cardiac death, often attributed to underlying coronary heart disease and cardiomegaly, represents the leading cause of on-duty fatalities among US firefighters, accounting for over 40%. Tommasi et al. (2020) emphasize that the nature of their work, which often involves high-risk situations, can increase the likelihood of heart attacks among firefighters. Furthermore, age plays a significant role, with older firefighters exhibiting a higher risk of experiencing a heart attack. Research, as cited by Tommasi et al. (2020) and supported by Noh et al. (2020), consistently demonstrates that firefighters have a significantly higher risk of cardiac-related mortality compared to individuals in other professions.

Health Perception of Firefighters

Leary et al. (2020) stated that when combined with inadequate fitness, carrying heavy equipment and wearing constricting apparel while working at a high intensity creates considerable physiological stress that can result in on-the-job cardiovascular disease events. Furthermore, due to the benefits given to responders who pass away from cardiovascular illness, become incapacitated as a result of their work-related orthopedic issues, or both, low fitness is linked to socioeconomic implications. The

safety and longevity of firemen and those they protect depend on their ability to maintain and improve their general health and physical fitness. Blaney (2017) added that exercise, emotional expression, self-awareness, and meaning making are a few examples of the coping techniques utilized to deal with the responses to PTEs (Potentially Traumatic Events).

Lan (2021) developed a 7-item healthy lifestyle (HLS) score, to measure recruits' adherence to HLS. An ideal healthy lifestyle (HLS) encompasses several key components, including abstinence from smoking, a healthy body mass index (BMI), and regular physical activity, decreased TV screen time, high quality dietary intake, sufficient sleep time, and a habit of taking naps. In conclusion, a healthy lifestyle score (HLS) intervention on new firefighters may be useful as one primary prevention approaches for firefighters that focus on reducing the risk of chronic diseases and promoting a longer career, even though probationary firefighter status has negative effects on new firefighters' health and fitness and existing academy training increases fire recruits' blood pressure despite other health and fitness gains throughout training.

Given their special nutritional needs to sustain physical performance, maintain a healthy level of recreation fitness, prevent injuries, and enhance their quality of life, it is inappropriate to compare firefighters' nutrient consumption to the DRI (Dietary Reference Intake) of the general population Johnson & Mayer (2020) stated. To effectively enhance the quality of life and work performance of firefighters, research is crucial to identify their specific dietary patterns. This knowledge will inform the development of tailored nutritional interventions. Palmer & Yoos (2019) observed that a significant number of firefighters lacked awareness of their key health indicators, including fasting blood sugar, total cholesterol, triglycerides, HDL, and LDL cholesterol

levels. In their study's key conclusion is that, despite increased cardiovascular disease risks, volunteer firemen appear to have little understanding of the condition. Romanidou et al. (2020) specified that the diet and lifestyle habits of firemen frequently result in obesity, which has a detrimental effect on society by raising the incidence of sick leave and the cost of healthcare. Contrarily, firemen who lead healthy lifestyles and maintain a healthy weight through exercise are more likely to keep their levels of cardiorespiratory fitness high as they age.

Health Promoting Behavior of Firefighters

Although there are health promotion programs within the fire services, they are uncommon, and there is little data on their efficacy as MacMillan et al. (2020) emphasized. Studies looking at health promotion initiatives in the fire services have varying degrees of quality. Although more thorough study is needed, health promotion programs in the fire services did have some positive benefits on health and lifestyle choices. These findings can help academics and health professionals create and carry out health promotion programs for the fire services (MacMillan et al., 2020). Only a small percentage of firemen engaged in the minimal amount of physical exercise advised according to Palmer & Yoos (2019). Chi-Ju's (2020) study revealed that the health promotion lifestyles of participants exhibited a moderate level, with scores ranging from high to low across various dimensions, including spiritual development, interpersonal relationships, stress management, physical exercise, diet, and health responsibility. Occupational health nurses can play a crucial role in promoting healthier lifestyles among firefighters by serving as positive role models. This includes actively engaging in health-promoting activities, maintaining a healthy weight through regular physical activity and a balanced diet, abstaining from smoking, and limiting alcohol

consumption. With varying ages, educational levels, fire credentials, and service units, the respondents' lifestyles for promoting health fluctuate greatly.

Despite the fact that there are health promotion activities within the fire services, they primarily aim to enhance cardiovascular and muscular fitness (MacMillan et al., 2020). However, there is either little information available or it is confined to one sort of health promotion intervention, such as exercise programs. In their study, Won et al. (2020) stated that the participating active Korean firefighters' mental health was enhanced by the mental health promotion program. In the meanwhile, BIC (Brief Intensive Counseling) engagement more significantly reduced several psychopathological symptoms. Consideration should be given to a comprehensive strategy for assisting firefighters with their mental health. In addition, MacMillan et al. (2020) described that the desired health outcomes, the evidence from RCT (Randomised Controlled Trial) interventions is encouraging, but it should be taken with care due to the diversity in research quality and the paucity of data. The long-term assistance for nutrition and physical activity focusing on behavior modification found to be the most promising.

In order to promote health, increase performance, boost recovery and resiliency, and decrease chronic illness for tactical demands, Johnson & Mayer (2020) states that the majority of professional firemen in the USA do not achieve the MDRI (Military Dietary Reference Intake) criteria in a number of important dietary variables. Lessons & Bhakta (2020) demonstrated the effectiveness of a cost-effective, easily implementable, and low-intensity intervention program designed to improve dietary habits, body composition, and mental health among firefighters. This intervention, which incorporates group education sessions, environmental modifications within fire

stations, and personalized nutrition guidance, has shown promising results. Due to its practicality and feasibility, this intervention model presents a viable option for widespread implementation within fire service organizations.

Health Risks of Firefighters

The impact of poor physical health among firefighters can extend beyond the individual, potentially affecting the safety and well-being of the public. The prevalence of illnesses and injuries among firemen is well understood, but little is known about how to improve firefighters' health during a recession. As a result, this study will advance knowledge of this issue and offer recommendations for occupational and environmental health nursing practice.

The literature consistently highlights the significant physical and psychological demands placed upon firefighters, including exposure to extreme temperatures, confined spaces, time constraints, smoke, noise, dust, and hazardous chemicals. These occupational stressors, combined with the heavy demands of the job, can create significant cardiac strain. Furthermore, as noted by Peate et al. (2002), an inaccurate self-assessment of physical fitness can lead to misjudging one's ability to perform under pressure, potentially increasing the risk of adverse outcomes.

Non-modifiable cardiovascular risk factors include age, gender, and family history of cardiovascular disease. Modifiable risk factors, such as diabetes, high cholesterol, high triglycerides, hypertension, and obesity, also significantly contribute to cardiovascular risk. The American Heart Association (AHA, 2000) emphasizes that the presence of multiple risk factors, advancing age, or significant elevations in any individual risk factor can substantially increase the overall risk of cardiovascular disease.

According to the Philippine Statistics Authority's 2022 press release, ischemic heart disease, cerebrovascular disease, and neoplasms (cancer) remained the leading causes of mortality in the Philippines from January to July 2022, mirroring the trends observed in 2021. Ischemic heart disease emerged as the leading cause, accounting for 57,899 deaths (18.6% of all deaths) during this period. Cerebrovascular diseases followed, contributing to 32,354 deaths (10.4%), while neoplasms accounted for 31,487 deaths (10.1%). Diabetes mellitus (6.4%) and hypertensive diseases (5.8%) ranked fourth and fifth, respectively, as leading causes of mortality.

Health Promotion Model by Nola Pender

The improvement of medical outcomes depends heavily on wellness and health promotion according to McPherson et al. (2016), but there is little study on how patients' views of their health may affect their willingness to participate in health improvement programs. McPherson et al. (2016) emphasize the critical need for health promotion strategies that empower patients, foster self-awareness, and address the underlying causes of chronic diseases. These strategies should prioritize patient responsibility while promoting a supportive and non-judgmental environment that motivates individuals to engage in healthy behaviors.

Lassen's (2017) research highlights the need for more effective and impactful health promotion interventions. Future research should focus on developing and implementing interventions with standardized outcome measures and comparable impact assessments. Furthermore, a diverse range of strategies, including personalized programs, supportive environments that encourage healthy eating and physical activity, and participatory approaches that empower individuals, should be explored within this target population.

According to Ripollone (n.d.), Pender's Health Promotion Model (HPM) emphasizes the interconnectedness of various factors. The model posits that personal factors directly influence health-promoting behaviors, while cognitions specific to those behaviors also play a crucial role. Furthermore, self-perceptions and external factors directly impact an individual's commitment to a plan of action, which subsequently drives health-promoting behaviors. Pender (1996) also highlights the influence of competing demands on health-promoting behaviors.

Aqtam & Darawwad (2018) conducted a comprehensive review of 17 studies, the majority of which employed quantitative research methods. These studies utilized instruments based on the HPM to investigate variables relevant to the model. The findings of this review demonstrated that the HPM possesses predictive value in assessing health-promoting behaviors. In conclusion, Aqtam & Darawwad (2018) stated that the HPM was extensively accepted in the nursing community and used in nursing practice, instruction, and research. In several research to forecast health-promoting behaviors in many chronic conditions, the HPM components were also utilized to propose conceptual frameworks.

Health-Promoting Lifestyle Profile II

Walker and Hill-Polerecky (1996) defined health-promoting behavior as a multifaceted pattern of self-initiated actions and attitudes that contribute to an individual's overall well-being, fulfillment, and self-actualization. The Health-Promoting Lifestyle Profile II (HPLP-II) is an established instrument for assessing these behaviors, suitable for research within the framework of Pender's Health Promotion Model (1987). While the dimensions of interpersonal relations and spiritual growth share a sense of connection and belonging, the literature supports their distinction as

separate subscales.

Davis and De Guzman (2022) investigated the validity and reliability of the HPLP-II among nursing students. As future healthcare professionals, nursing students are expected to serve as role models for health promotion. The findings of this study provide strong evidence for the validity and reliability of the HPLP-II in assessing health-promoting behaviors among this population.

Waist-to-Hip Ratio (WHR)

Alternatives to BMI, such as waist circumference and waist-to-hip ratio (WHR), offer more accurate assessments of health risks. As emphasized by Fauziana et al. (2016), organizations like the National Institute for Health and Clinical Excellence (NICE) and the National Institutes of Health (NIH) advocate for these measurements. This is because abdominal fat accumulation, specifically measured by these parameters, is strongly linked to an increased risk of developing chronic diseases such as diabetes and hypertension.

The risk of myocardial infarction was also observed to increase with increasing waist-to-hip ratio according to Murray (2006). In addition, Cao et al. (2018) stated that due to the fact that patients with a high WHR have a much higher risk of Myocardial Infarction (MI), WHR is considered to be a very accurate predictor of MI risk. Waist-to-hip ratio (WHR) exhibits a stronger predictive value for the risk of myocardial infarction (MI) in women compared to men. Singh et al. (2018) emphasizes that WHR, compared to Waist Circumference (WC), serves as a more reliable indicator of cardiovascular disease (CVD) risk. Both WHR and WC are valuable measures of abdominal obesity and should be incorporated into effective weight management strategies.

Body Mass Index (BMI)

Utilizing Pender's Health Promotion Model to Assess Health Risks Among Firefighters in 20
Bulacan, Philippines

The World Health Organization (WHO, 2010) defines Body Mass Index (BMI) as a simple, cost-effective, and non-invasive method for estimating body fat. Calculated as a ratio of weight to height, BMI is a widely used indicator of body fatness. However, it's crucial to note that BMI primarily reflects excess weight rather than directly measuring body fat itself.

BMI, a standardized anthropometric measurement adopted by the WHO, categorizes individuals based on their weight-to-height ratio into categories such as underweight, normal weight, overweight, and obese (Fauziana et al., 2016). While BMI serves as a valuable indicator of nutritional status and is associated with various health risks, including hypertension, diabetes, and heart disease (Fauziana et al., 2016; WHO, 2010; Gutin, 2018; Nuttall, 2015), it's important to recognize its limitations. As noted by Nuttall (2015), BMI is often interpreted as a direct measure of body fat, while in reality, it serves as a proxy for assessing an individual's risk for various health conditions.

Palmer & Yoos (2019) found that many firefighters lacked awareness of their waist circumference, despite the significant role of obesity in their overall health. Cao et al. (2018) emphasize that while Body Mass Index (BMI) provides an overall assessment of obesity, extensive research has demonstrated a strong association between BMI and the risk of myocardial infarction (MI). BMI is a fair way for people to gauge their health since it enables them to do so independently of medical professionals (Gutin, 2018). Further, Gutin (2018) argues that the limitations of BMI, both in terms of its practical application and theoretical underpinnings, raise concerns about its validity and reliability as a measure of "healthy weight." These limitations necessitate a more critical evaluation of BMI and its role in assessing individual health.

Blood Pressure (BP)

Blood pressure readings as to Ramnarine (2018) are taken for any different purposes, such as checking for hypertension, identifying a person's appropriateness for a sport or a certain job, predicting cardiovascular risk, and measuring risk for different medical treatments. In a study conducted by Paler & Yoos (2019), most firemen were conscious of their blood pressure, yet findings support the notion that volunteer firefighters may be more susceptible to cardiovascular disease. A critical vital marker that influences both short-term and long-term therapeutic decisions is blood pressure according to Rehman (2021). It is crucial to monitor blood pressure precisely and consistently because of its significance in guiding care.

Muntner et al. (2019) emphasizes the critical importance of accurate blood pressure (BP) measurements for the diagnosis and management of hypertension. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) are the most reported BP measurements in clinical practice and research due to their recognized association with cardiovascular disease (CVD) risk. Elevated SBP and DBP are independently associated with an increased risk of CVD events. While SBP is consistently linked to CVD events, studies have shown that DBP may not be independently associated with CVD risk, particularly in older populations, after adjusting for SBP (Muntner et al., 2019).

Philippine Setting

Allanic, Cuevas, and Prenala (2019) stated that without a question, fire events are among the most common natural catastrophes in the Philippines, especially in residential areas in both urban and rural locations. According to the study's findings, it is advised to step up the fire prevention effort, especially in residential areas. It is

advantageous to recruit community members to serve as volunteer firefighters who will get ongoing training from the Bureau of Fire Protection Personnel. According to de Leon and Miranda (2022), fire incidents remain a significant concern in the Philippines due to a combination of meteorological factors and the widespread use of flammable materials in residential and commercial structures. The persistently high number of fire incidents underscores the critical need for the Bureau of Fire Protection (BFP) to continue implementing robust strategies for fire prevention and mitigation. Data from the Congressional Policy and Budget Research Department (2020) reveals that between 2013 and 2018, an average of 15,733 fires occurred annually in the Philippines, resulting in an average of 855 injuries and 253 fatalities.

According to the Philippines Ministry of Health (n.d.), non-communicable diseases (NCDs), such as cancer, cardiovascular diseases, diabetes, and chronic respiratory illnesses, have emerged as a major public health challenge. These conditions, along with their associated risk factors, pose a significant threat to public health and development in the country. However, in the Philippines, noncommunicable diseases (NCDs) are now the main source of disease burden. About 70% of the 600,000 deaths countrywide in 2019 were caused by NCDs; in the medium to long term, it is expected that this number would rise (Ulep et al., 2020).

Nursing Implications

Palmer and Yoos (2019) highlight the ongoing significance of cardiovascular disease and sudden cardiac death as major public health concerns among volunteer firefighters. While the study's response rate was limited, participants reported positive outcomes from the health training program. These findings underscore the need for continued education and the development of targeted interventions for firefighters,

with occupational health nurses playing a crucial role.

Occupational health nurses can serve as valuable health promotion advocates, encouraging firefighters to adopt healthy lifestyles, including increased physical activity, a balanced diet, smoking cessation, and moderate alcohol consumption. This study demonstrates the feasibility and effectiveness of a health promotion intervention when integrated with regular health screenings. Furthermore, occupational health nurses can collaborate with other healthcare professionals to develop and implement comprehensive health and fitness policies within fire departments (Byczek et al., 2004).

Palmer and Yoos (2019) emphasize the unique position of occupational health nurses and nurse practitioners in addressing the modifiable risk factors for cardiovascular disease among firefighters. These factors include diet, cardiovascular health, and the ability to maintain a healthy weight. By conducting risk assessments, developing and implementing interventions, evaluating program effectiveness, and communicating the specific health risks associated with firefighting to community providers, occupational health professionals can significantly impact firefighter health. Given the inherent risks associated with firefighting, early identification and ongoing surveillance of firefighters with cardiovascular risk factors are crucial.

Firefighters with higher levels of fitness demonstrate improved on-the-job performance (Williford, 1999 as cited by Palmer & Yoos, 2019), reduced injury rates, and lower healthcare costs for both them and their departments (Cady, 1985 as cited by Palmer & Yoos, 2019). Moreover, enhanced physical fitness can contribute to a reduction in musculoskeletal injuries (Reichelt, 1995 as cited by Palmer & Yoos, 2019). To effectively address the prevalence of overweight, obesity, high cholesterol, and

hypertension among firefighters, workplace fitness programs should incorporate the Healthy People 2010 targets for physical activity.

Synthesis

Firefighters endure significant physical and mental strains as they confront the multifaceted challenges of their profession. Makara-Studzińska (2019) underscores their susceptibility to traumatic situations and chronic stress, exposing them to risks ranging from burns to hazardous chemicals. This occupational stress manifests in escalating cardiovascular risk factors, leading to heightened morbidity and mortality rates among firefighters, as documented by Muegge (2020) and Palmer & Yoos (2019). The cumulative impact of stress, poor diet, and lifestyle habits exacerbates these risks, necessitating urgent interventions to safeguard firefighters' health and well-being.

Lan (2021) emphasizes the importance of implementing lifestyle interventions, such as smoking cessation programs and initiatives promoting adequate physical activity, to effectively mitigate the risk of chronic diseases among firefighters. However, the scarcity of comprehensive health promotion programs within fire services, as highlighted by MacMillan et al. (2020), underscores the need for tailored interventions addressing both physical and mental health concerns. Johnson & Mayer (2020) emphasize the importance of dietary interventions, while Lessons & Bhakta (2020) demonstrate the efficacy of low-cost dietary and lifestyle interventions in improving firefighters' dietary behaviors and mental health indicators.

To ensure the long-term health and resilience of firefighters, it is crucial to implement evidence-based interventions and foster a culture of health consciousness within fire service organizations. Nola Pender's Health Promotion Model (HPM)

provides a valuable framework for understanding and promoting health behaviors by emphasizing individual self-awareness and motivation. Furthermore, the Health-Promoting Lifestyle Profile II offers a practical tool for assessing and enhancing workplace health promotion efforts. By utilizing these frameworks, valuable insights into health risk behaviors can be gained, informing the development of effective intervention strategies.

Comprehensive health assessments, utilizing tools such as Body Mass Index (BMI), health history assessments, Waist-to-Hip Ratio (WHR), and blood pressure measurements, are essential for evaluating an individual's overall health status and identifying potential health risks. These assessments contribute to a holistic approach to well-being and disease prevention, encompassing individual behaviors, environmental influences, and clinical measures. In the Philippine setting, intensified prevention efforts and community involvement in firefighting initiatives are essential to address fire-related challenges, alongside tackling the emerging threat of noncommunicable diseases (NCDs).

Addressing the health needs of volunteer firefighters is crucial for mitigating the risk of cardiovascular disease and sudden cardiac death. Occupational health nurses play a vital role in this endeavor by providing health education, implementing interventions, and promoting healthy lifestyle choices among firefighters. Collaborating with interdisciplinary teams, nurses can enhance firefighters' health outcomes by focusing on fitness, proper nutrition, and cardiovascular health, thereby reducing injury rates and healthcare expenditures.

In conclusion, firefighters face formidable challenges that necessitate

comprehensive interventions to protect their health and well-being. By implementing evidence-based strategies, fostering a culture of health consciousness, and leveraging interdisciplinary collaboration; can ensure the resilience and longevity of these indispensable public servants, ultimately benefiting both firefighters and the communities they serve.

Theoretical Framework

The U.S. Department of Health and Human Services (n.d.) recognizes that successful health promotion programs can contribute to an increase in an individual's overall well-being. The success of health promotion requires many degrees of behavior modification. Different health promotion initiatives and practices don't necessarily provide the same results. The degree to which health promotion is successful depends on the individual's understanding, willingness, and relationship to the immediate environment.

The U.S. Department of Health and Human Services (n.d.) emphasizes the importance of strategic planning models in the development, implementation, and continuous improvement of health promotion programs. These programs are enhanced through rigorous evaluation and informed by relevant health behavior theories.

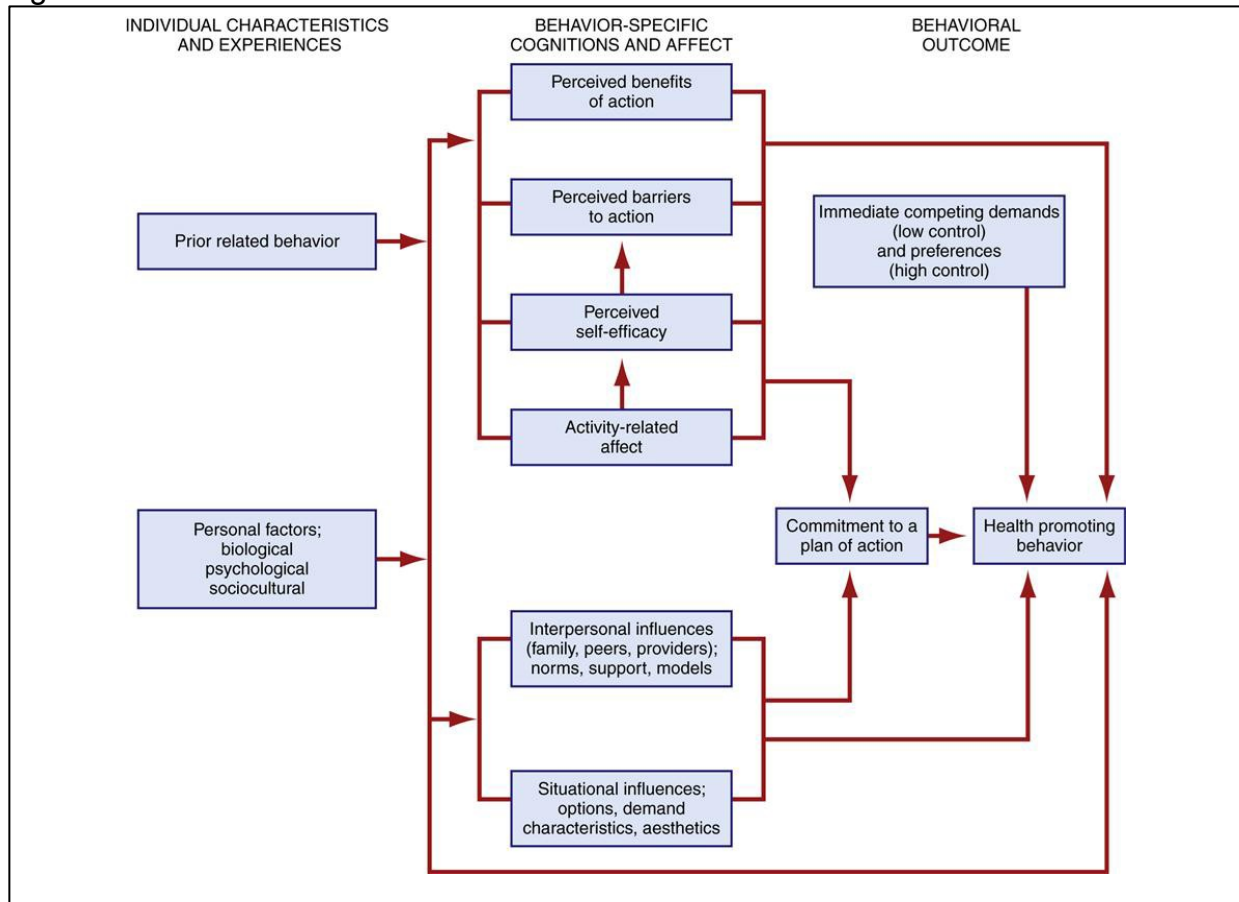
Pender's Health Promotion Model (HPM) provides a holistic framework for understanding individual health behaviors, emphasizing the importance of considering personal background and self-perceptions when developing interventions (Ripollone, n.d.). This model is particularly relevant for individuals at critical junctures in their lives, such as those making independent healthcare decisions.

The HPM posits that individual characteristics and experiences, prior behaviors, and the frequency of past health-promoting behaviors significantly influence an individual's likelihood of engaging in future health-promoting actions. The model acknowledges that personal factors, including knowledge and beliefs, play a crucial role in motivating health-promoting behaviors. These factors can be influenced by nursing interventions. Ultimately, the HPM emphasizes that the desired outcome of health-promoting behaviors is improved health, well-being, and overall quality of life.

As conceptualized by Petiprin (2016), Pender's HPM was developed as a complementary framework to existing models of health protection. Unlike models that primarily focus on disease prevention, the HPM defines health as a positive and dynamic state of well-being. It emphasizes that health promotion is directed towards enhancing an individual's overall well-being by considering the multidimensional nature of individuals within their unique environmental contexts (see Figure 1).

The goal of health-promoting behaviors is to achieve positive health outcomes, including optimal well-being, personal fulfillment, and productive living. While Pender's Health Promotion Model offers a valuable framework for understanding health behaviors among firefighters, further research is needed to assess its applicability and determine the necessary adaptations for this specific population. It can also be concluded that firefighters as a respondent of several studies is necessary to expand the availability of related literature.

Figure 1. The Health Promotion Model of Nola Pender.



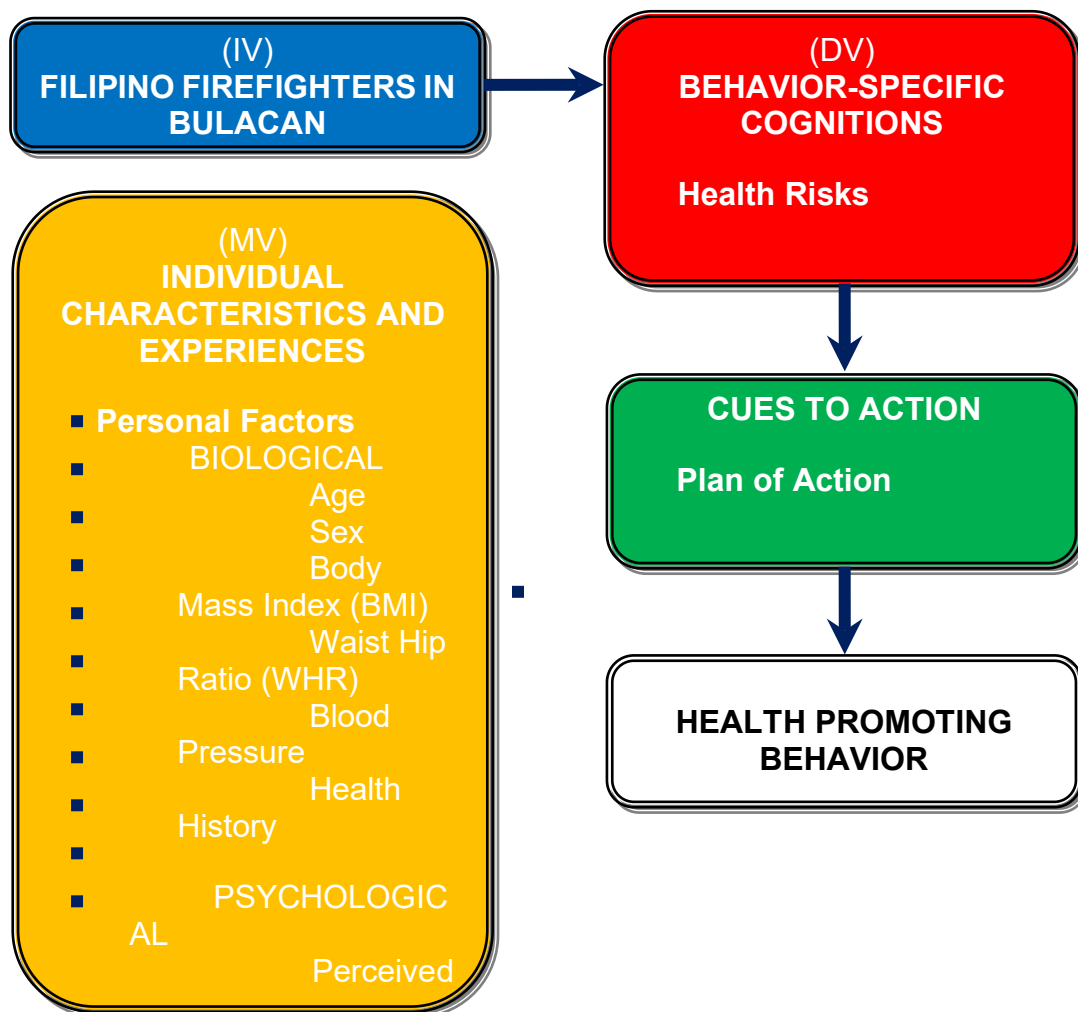
(SOURCE: Image retrieved dated 25 August 2017 at <https://nursekey.com/health-promotion- and-risk-reduction-in-the-community/>)

Conceptual Framework

The firefighters in Bulacan as the respondents as being fathomed by this study are the Independent Variables (IV) that directly affected by their individual Behavior-Specific Cognition serves as the Dependent Variable (DV). Figure 2 represents the conceptual framework of this study wherein a direct connection between the variables where the DV can be significantly affected by the IV. This study utilizes Nola Pender's Health Promotion Theory as its framework. Within this framework, "Individual Characteristics and Experiences" serve as a modifying variable, directly influencing the relationship between independent and dependent variables. Pender's theory emphasizes that individual characteristics and experiences, such as prior behaviors

and personal factors, can significantly shape an individual's understanding of wellness and physical fitness, ultimately impacting their health-promoting behaviors.

Figure 2. This Study's Conceptual Framework: Application of Pender's Health Promotion Model to Identify Health Risks of Firefighters in Bulacan: Implications to Nursing Practice.



This study will examine individual characteristics and experiences through a multi-faceted lens, encompassing biological, psychological, and socio-cultural aspects. Specifically, the study will investigate the following personal factors:

1. Age
2. Sex
3. Body Mass Index (BMI)
4. Waist-Hip Ratio (WHR)

5. Blood Pressure
6. Health History
7. Perceived Health Status
8. Marital Status
9. Educational Attainment
10. Length of Fire Service

These factors will provide valuable insights into the unique circumstances and experiences of each firefighter participant. These factors are considered in identifying the health promoting behavior of the respondents in such a way it directly contributes to their perceptions towards activities leading to health promotion.

The Behavior-Specific Cognitions of firefighters in Bulacan are the health risks of the firefighters in Bulacan. These perceptions of the respondents are directly contributing to their health promoting behavior as a result of their plan of action.

Firefighters in Bulacan health promoting behavior and wellness attainment are interconnected depending on the perceptions of an individual and continually affects one another. Individual perceptions and experiences may affect the health promoting activities that may lead to either positive or negative effects on wellness. An individual's perceived risk of disease and the perceived benefits of physical activity are key motivators for adopting recommended exercise regimens. In adopting appropriate healthy behaviors and/or avoidance and eliminating unhealthy ones, people progress related to their readiness to adopt and adapt.

Operational Definition of Terms

Demographic Profile of Firefighters (Individual Characteristics and Experiences):

The demographic profile of firefighters encompasses various personal and professional attributes that can influence their health and job performance. The study will examine individual characteristics and experiences such as age, sex, body mass index (BMI), waist-hip ratio (WHR), blood pressure, health history, perceived health status, marital status, educational attainment, and years of service in the fire bureau.

- *Age*: The number of complete years since the firefighter's birth.
- *Sex*: Biological distinction (Male/Female).
- *Body Mass Index (BMI)*: A mathematical calculation representing the ratio of an individual's weight in kilograms to their height in meters squared.
- *Waist-Hip Ratio (WHR)*: The ratio determined by dividing the measurement of the waist by the measurement of the hips.
- *Blood Pressure*: Measurements of systolic and diastolic blood pressure taken with a standard blood pressure cuff (sphygmomanometer). Measured in mmHg using a sphygmomanometer, categorized into normal, prehypertension, or hypertension.
- *Perceived Health Status*: Self-assessment of overall health, typically rated on a scale.
- *Marital Status*: The current legal relationship status of the firefighter (Single, Married, Divorced, Widowed).
- *Educational Attainment*: Highest educational attainment achieved by the firefighter, including High School, bachelor's degree, and Master's Degree.
- *Length of Service*: The total number of years the firefighter has served in the Fire Bureau.

Health Risks: Health risks refer to the self-identified threats to health and well-being of the firefighters. These risks can be related to various physical, mental, and behavioral health aspects. The health risks faced by Filipino firefighters in Bulacan can be evaluated by examining several key dimensions, including Health Responsibility, Physical Activity, Nutrition, Spiritual Growth, Interpersonal Relations, and Stress Management.

- *Health Responsibility:* The level of proactive health management demonstrated by firefighters, encompassing regular health check-ups, adherence to medical advice, and the practice of preventive health behaviors.
- *Physical Activity:* The extent and intensity of physical activities that firefighters engage in, both on duty and off duty, which contribute to overall physical fitness and health.
- *Nutrition:* The quality and balance of dietary intake, including the consumption of essential nutrients and adherence to healthy eating guidelines.
- *Spiritual Growth:* The personal and communal practices that contribute to a sense of purpose, inner peace, and connection to a higher power or meaning in life.
- *Interpersonal Relations:* The quality and strength of relationships with family, friends, colleagues, and the broader community, which contribute to emotional and social well-being.
- *Stress Management:* The strategies and techniques used to cope with and mitigate stress, including both proactive and reactive measures.

Implications to Nursing Practice: Implications to nursing practice involve

understanding how the health risks and individual characteristics of firefighters can influence nursing strategies and interventions. This includes identifying specific areas where nursing practices can be improved to promote wellness and reduce health risks among firefighters.

- *Behavior-Specific Cognition and Affect*: Assessed through questionnaires on firefighters' perceptions and attitudes towards health-promoting behaviors.
- *Participation in Action Plans*: Measured by the likelihood and willingness of firefighters to engage in proposed health interventions and action plans.
- *Health Promoting Lifestyle*: A comprehensive pattern of self-initiated actions and perceptions that promote and support an individual's level of wellness, self-actualization, and fulfillment.
- *Health Responsibility*: This dimension assesses the extent to which firefighters engage in proactive health management behaviors, including regular health check-ups, adherence to medical advice, and the practice of preventive health measures.

Chapter III

RESEARCH METHODOLOGY

Research Design

A quantitative research design was employed to comprehensively analyze the health risks of firefighters in Bulacan and their potential engagement in health promotion. Pender's Health Promotion Model was utilized to assess health risks and determine the likelihood that individuals engaged in health-promoting behaviors. A correlational approach examined the relationship between firefighters' demographic profiles and their health risks. Descriptive statistics provided a summary of the respondents' demographics and health-related behaviors. Data was collected through structured surveys and analyzed according to the study's objectives.

Research Setting

This research study was conducted in the fire stations/offices within the province of Bulacan. Comprises one (1) provincial headquarters/office and 24 towns (20 municipalities and four cities) which have established 'fire stations' operated and manned by the Bureau of Fire Protection (BFP). Such personnel of the BFP are all professional and Filipino native. Considering that the province of Bulacan is adjacent to the National Capital Region (NCR) and catering numerous constituents and tedious work loads arises from urbanization of the province. In addition, BFP-Bulacan contributes to the larger portion of manpower of Central Luzon in connection to fire service.

Sampling Technique

This study sought to describe the health conditions of firefighters in Bulacan as well as their health promoting behavior as predictors of attaining wellness. Firefighters were the study population as this study focused on the province of Bulacan. The Bureau of Fire Protection is an agency of the Philippine Government, and all its personnel are Filipino people, relatively uniformed personnel and at professional level as regulated by the Civil Service Commission.

Firefighters in Bulacan, as per research nature, may or may not generally represent the whole population of the firefighters neither in Region 3 (Central Luzon) nor in the Philippine setting. Description, comparison, and correlation findings represented only the specific target population under study which is the firefighters' in Bulacan. The study was limited to active firefighters in service (BFP) within the province of Bulacan and which are currently assigned in fire stations within 24 cities and municipalities province-wide; and assigned in the provincial headquarters and auxiliary offices.

The Bureau of Fire Protection – Bulacan, with total active personnel of 542 as of September 2024 (as provided by the Provincial Personnel Section Chief), were the target population for this study. Given the varying population sizes across different fire stations (clusters), a multi-stage sampling technique will be employed. Power analysis determined a required sample size (approximately 80% of the total population) to achieve a statistical power of 80%, ensuring a 20% margin of error. A multi-stage sampling process was used as follows:

1st Stage (Cluster of Fire Station): a Cluster of 'station assignment' was used in order to group all personnel/firefighters in Bulacan per locality.

2nd Stage (Strata of Personnel): BFP personnel that are categorized as Uniformed Personnel that are not in mandatory training are included and will be covered by the data gathering procedure. Non-Uniformed Personnel were excluded in this study and also those on official leave.

3rd Stage (Simple Random Sampling): a simple random sample of approximately 80% of uniformed personnel from each cluster was selected using a draw-lot method.

Data Collection

Initial approval for this research was sought from the Office of the Regional Director of the Bureau of Fire Protection (BFP)-Region 3 and from the Office of the Provincial Fire Marshal (OPFM) BFP-Bulacan on behalf of the Fire Marshals of every fire station. Personnel of the BFP have undergone orientation training prior to deployment at the Fire Station/Offices; therefore, a Medical First Responder course was part of the orientation training in which getting blood pressure, heart rate, height, weight, and alike were taught to every trainee fire officer. Further, each probable respondent is trained and expected to get the precise measurements for the height, weight, hip and waist measurement, and blood pressure.

Deeply as part of the ethical considerations, approval from the Ethics Review Board/Committee will be obtained. An approval will be obtained from the Senior Officers from regional and provincial offices followed by the fire stations' Fire Marshals. Requesting consent from the respondents is one of the basic ethics and legal requirements that must be always observed. The copies of the informed consent form, questionnaire and written proposal or protocol would be provided to the office and will be handed to all respondents (see Appendix D). Due to the existing threat of COVID-

19 Pandemic and efficiency of the data collection and acknowledgement of the accomplished forms, data gathering will be performed with the use of Google Forms. A link will be sent to the registered e-mail address of each fire station accompanied with a letter-of-approval/memorandum from the OPFM-Bulacan. The research respondent will be selected randomly by draw-lot as described in Section 3.b Participants from a roster of personnel per station provided by the Office of the Provincial Fire Marshal.

During the data collection process, all participants will receive detailed information about the study and will be required to sign an informed consent form (see Appendix C). Respondents will receive a copy of the informed consent form with the contact information of the researcher. Each respondent will have to answer a two-part survey tool/questionnaire that includes the research-made questionnaire covering the individual characteristics and experiences and health risks.

This study involves no known risks and/or discomforts on the part of the firefighters. There is no known risk in any form to anybody, yet a normal discomfort of uneasiness will be encountered while answering the questionnaire due to prolonged sitting and being conscious as the interview takes place. Potential benefits might include that of identifying such health promoting activities in relation to further development of uniformed fitness programs. It will take 20 to 30 minutes to complete the two-part questionnaire including measurement of height, weight, hip and waist measurement, and blood pressure. Participation in this study is entirely voluntary. Participants have the right to decline participation and withdraw from the study at any time without any negative consequences. The participation in this study is merely voluntary and not entitled for any rewards and compensation nor reimbursements of

expenses incurred because of your participation. There are no anticipated expenses the participants will inflict as the survey will take place on their convenience time and place at work. There will be neither insurance nor compensation in any form for any cause of injury inflicted during the duration of the survey. There will be no biological specimens collected from the participants and no products will be developed by this study. The participants are not entitled to any income derived from the results of the study. The study is self-funded research, and the researcher is also the primary investigator. There is neither sponsor nor finance support from any entities to support the nature and source of funds.

Data gathered will be treated and stored confidentially and electronically by the researcher thru personal computers drive and external digital hard drive. Only the researcher and the UPOU has the access of the data and will be accessed only if warranted in respect to the results of study. There will be no biological specimens collected from the participants and no products will be developed by this study. The respondents are not entitled to any income derived from the results of this study. Respondents may access only their individual results and/or the generalized results of the survey as soon as it becomes available as per request in writing or any legal representative on their behalf.

The responses/data gathered will be analyzed and further be reported and publicized. The research findings will be shared broadly later through publications and conferences if permitted by the organizers. The Institutional of Research Ethics Committee (IREC) of the University of the Philippines-Open University (UPOU), National Ethics Committee (NEC) and or other ethics board/committee that has accountability with this study may access of the data gathered as part of the ethical

consideration and academic purposes of verification of procedures. The results generalization might be published to the extent permitted by the law and your identity will be protected, hence the ability of other entity/ies in mastery of identifying your identity is beyond the capability of the researcher.

Research Instrument

Health Risks/Behavior-Specific Cognition and Affect

Health-Promoting Lifestyle Profile II. The Health-Promoting Lifestyle Profile II (HPLP-II), revised in 1995, is a self-report instrument designed to assess an individual's engagement in health-promoting behaviors. This instrument measures a multidimensional construct encompassing self-initiated behaviors and attitudes that contribute to enhanced well-being, self-actualization, and overall fulfillment. The HPLP-II utilizes a 52-item scale to assess the frequency of self-reported health-promoting behaviors across five key areas: physical activity, nutrition, spiritual growth, interpersonal relationships, and stress management. A 4-point Likert scale (Never, Sometimes, Often, Routinely) is used for responses, with scores ranging from 1 to 4, resulting in a maximum possible score of 208.

Individual Characteristics and Experiences

Waist-to-Hip Ratio. WHR was computed by the researcher based on the detail that the respondents provided on the circumference measurement (in centimeter, cm) of their waist and hip. Detailed instruction was provided and executed to attain the precise measurements (see Appendix C). Waist circumference was measured by standing upright and exhaling, then wrapping a measuring tape around the waist just above the belly button. The tape was snug but not overly tight. The researcher recorded the measurement where the tape ends overlap. To measure hip

circumference, the personnel stood upright, and the measuring tape was wrapped around the widest part of the hips.

Waist-to-Hip Ratio (WHR) was calculated by dividing waist circumference by hip circumference. Measurements was recorded in either centimeters (cm) or inches (in) as the ratio remains unaffected. According to the World Health Organization (WHO, 2008), a healthy WHR is generally considered to be 0.85 or less for women and 0.9 or less for men (see Table 1).

Table 1

WHO Risk Classification by Weight Related Health Conditions According to WHR

Health risk	Men	Women
Low	0.95 or lower	0.80 or lower
Moderate	0.96-1.0	0.81-0.85
High	1.0 or higher	0.86 or higher

(SOURCE: Retrieved dated 01 June 2022 at www.MedicalNewsToday.com)

Body Mass Index. BMI was computed by the researcher based on the detail that the respondents provided on the measurement of their weight (kilogram, kg) and height (centimeter, cm). Body Mass Index (BMI), previously known as the Quetelet index (World Health Organization, 2010), is a widely used measure for assessing nutritional status in adults. Detailed instruction will be provided and must be executed in order to attain the precise measurements (see Appendix C). The respondent's weight needs to be measured using a weighing scale and standing up straight and breathing out. The height will be measured by standing up straight, shoeless with heels against a wall and arms hanging relaxed at their sides. A measuring tape was secured to the wall and height obtained by placing a level lightly on the crown of the head.

BMI, an index originally termed the Quetelet index by the World Health Organization (2010), is calculated by dividing an individual's weight in kilograms by the square of their height in meters (see Table 2).

Table 2

Nutritional Status

BMI	Nutritional Status
Below 18.5	Underweight
18.5–24.9	Normal weight
25.0–29.9	Pre-obesity
30.0–34.9	Obesity class I
35.0–39.9	Obesity class II
Above 40	Obesity class III

(SOURCE: Retrieved dated 01 June 2022 at www.WHO.int)

Blood Pressure. Blood pressure consists of two measurements: systolic and diastolic. Systolic pressure measures the force exerted by the heart as it contracts, while diastolic pressure measures the force exerted between heartbeats. These measurements will be taken using a sphygmomanometer, with detailed instructions provided in Appendix C of the questionnaire. Two readings will be taken with a minimum of 30 seconds between each, and the average will be recorded in millimeters of mercury (mmHg). According to the American Heart Association (AHA), elevated blood pressure is defined as a systolic reading greater than 120 mmHg or a diastolic.

Figure 3. Blood Pressure Category

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)	and/or	DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

(SOURCE: Retrieved dated 01 June 2022 at www.heart.org)

Demographic Profile. Demographic information, including age, sex, educational background, marital status, and length of service in the fire service, will be collected using a brief questionnaire developed specifically for this study (see Appendix C). The questionnaire will also assess the respondents' perceived current health status using a 5-point Likert scale ranging from "Excellent" to "Poor."

Behavioral Outcome

Health-Promoting Lifestyle Profile II. The average of a person's answers to all 52 questions is used to get their overall health-promoting lifestyle score. In a similar manner, the means of the answers to the subscale items are used to determine the scores for six subscales. To facilitate comparisons of scores across subscales and maintain the 1-4 response scale, mean scores will be utilized instead of raw sums of item scores.

Pilot study

The respondents, firefighters in Bulacan, of this activity shall be duly informed. Pre- testing of the questionnaire will be the strategy to obtain feedback on the draft questionnaire. It generally comprises the same tools for the actual data gathering but

includes a feedback portion where the pre-test participants can place their reactions to item form, wording, and order as well as the general structure or format. The feedback will help provide an overview of how the tool would be convenient before the actual respondents will be asked. Translation of the tool would no longer be needed since the respondents are all professional and expected to be at least aware of different health related terminologies.

In the conduct of the pilot study, a sample of 4 to 5 respondents from a government office will be selected to be part of the pre-testing of the designed tool. The intended sample represents the various subgroups within. Pilot testing is a crucial step in the research process. It involves administering the survey, guide, or observation form to a small group of individuals before full data collection begins. This allows researchers to assess the clarity and comprehensibility of the instruments, ensuring that all participants interpret the questions consistently. Additionally, pilot testing helps to identify any questions that may cause discomfort among respondents and determine the approximate time required to complete the instruments.

Plan for Data Analysis

Quantitative research methods will be used to analyze the relationship between demographic factors and health risks among firefighters in Bulacan. Data collected through a structured questionnaire will be analyzed using Microsoft Excel. Descriptive analysis, including frequency distributions, percentages, ranks, and means, will be employed to characterize the sample and study variables. Further analysis will explore the association between demographic and health risks and assess firefighters' perceived health risks and potential engagement in health promotion activities.

Pearson correlation coefficients will be utilized to assess the linear relationships

between Perceived Health Status and Health Responsibility, and between Health-Promoting Lifestyle and Health Responsibility. Both variables are measured on a Likert scale, making Pearson correlation with 0.05 level of significance level appropriate for this analysis. This statistical method will determine if there are significant differences in health risks across different demographic groups.

Table 3

Plan for Data Analysis

Research Objective	Research Question	Study Variable	Data Analysis
Describe and examine the Individual Characteristics and Experiences of firefighters in Bulacan and its relationship with their Behavior-Specific Cognitions and Affect in relation to the Health Promotion Model of Nola Pender.	What is the demographic profile of firefighters in Bulacan in terms of the Individual Characteristics and Experiences such as: Age, Sex, Body Mass Index [BMI], Waist Hip Ratio [WHR], Blood Pressure, Marital Status, Health History, Perceived Health Status, Educational Attainment, and Length of Fire Service?	<i>Individual Characteristics and Experiences</i> <ul style="list-style-type: none"> ● Age ● Sex ● Body Mass Index ● Waist Hip Ratio ● Blood Pressure ● Marital Status ● Educational Attainment, ● Perceived Health Status ● Length of Fire Service ● Health History 	Descriptive Analysis (Frequency Distribution, Percentage, Mean)
	What is the relationship between the Individual Characteristics and Experiences (Perceived Health Status) and health risks (Health Responsibility) of the firefighters in Bulacan?	<i>Individual Characteristics and Experiences</i> <ul style="list-style-type: none"> ● Perceived Health Status <i>Health Risks</i> <ul style="list-style-type: none"> ● Health Responsibility 	Inferential Analysis (Pearson-r Correlation Coefficient)
Investigate the health risks faced	What are the health risks level of Filipino	<i>Health Risks</i> <ul style="list-style-type: none"> ● Health 	Descriptive

<p>by firefighters in Bulacan and analyze how these health risks correlate with their Individual Characteristics and Experiences that influence their health promotion;</p>	<p>firefighters in Bulacan in terms of: Health Responsibility, Physical Activity, Nutrition, Spiritual Growth, Interpersonal Relations, Stress Management</p>	<ul style="list-style-type: none"> ● Responsibility ● Physical Activity ● Nutrition ● Spiritual Growth ● Interpersonal Relations ● Stress Management 	<p>Analysis (Frequency Distribution, Percentage, Mean, Rank)</p>
	<p>Is there a significant difference between the Behavior-Specific Cognitions and Affect (health risks) of firefighters in Bulacan with their Individual Characteristics and Experiences (demographic profile)?</p>	<p><i>Individual Characteristics and Experiences</i></p> <ul style="list-style-type: none"> ● Age ● Sex ● Body Mass Index ● Waist Hip Ratio ● Blood Pressure ● Marital Status ● Educational Attainment, ● Length of Fire Service ● Health History 	<p>Inferential Analysis (ANOVA)</p>
<p>Apply the 'Pender's Health Promotion Model' to assess the likelihood of firefighters in Bulacan based on their Behavioral Outcome to participate in proposed action plans and explore the implications for nursing practice arising from these findings.</p>	<p>Based on the application of Pender's Health Promotion Model, what is the probability of participating in a plan of action for firefighters in Bulacan based on their Health Promoting Lifestyle? What are the implications to nursing practice of the Individual Characteristics and</p>	<p><i>Health Risks</i></p> <ul style="list-style-type: none"> ● Health Responsibility ● Physical Activity ● Nutrition ● Spiritual Growth ● Interpersonal Relations ● Stress Management <ul style="list-style-type: none"> ● Health-Promoting Lifestyle ● Health Responsibility 	<p>Descriptive Analysis (Frequency Distribution, Percentage) Inferential Analysis (Pearson-r Correlation)</p>

Experiences of the firefighters in Bulacan; their health risks and the Behavior-Specific Cognition and Affect towards Behavioral Outcome in health promotion?

Coefficient)

Ethical Considerations

The researcher upholds a strict regard on ethical issues posed by this research. Thus, permission to conduct the study has been applied from Institutional Review Board. A request letter was sent to the appropriate coordinators and offices for review and approval. Participants were informed that the study was for academic research and data were to be used to any purpose aside from stated. They were also advised that they are free to withdraw in any case they found the study inconvenient to them. All documents and information used in the study were kept in a password-protected laptop, that only the researcher has access. All data gathered, in form of physical and electronic records will be properly disposed after the completion of research study.

Chapter IV

RESULTS AND DISCUSSIONS

Results

The results of the study are presented and discussed in this chapter, starting with an analysis of the research group based on selected demographic factors. The analysis is then organized and presented in accordance with the study's objective.

Table 4

Respondent's Unit Assignment (n=493)

Station	Frequency	Percentage
Angat Fire Station	15	3.0
Balagtas Fire Station	19	3.9
Baliwag Fire Station	22	4.5
Bocaue Fire Station	20	4.1
Bulacan Provincial Office - Region III	16	3.2
Bulakan Fire Station	15	3.0
Bustos Fire Station	22	4.5
Calumpit Fire Station	16	3.2
Doña Remedios Trinidad Fire Station	14	2.8
Guiguinto Fire Station	19	3.9
Hagonoy Fire Station	14	2.8
Malolos Fire Station	30	6.1
Marilao Fire Station	24	4.9
Meycauayan Fire Station	29	5.9
Norzagaray Fire Station	15	3.0
Obando Fire Station	14	2.8
Pandi Fire Station	16	3.2
Paombong Fire Station	14	2.8
Plaridel Fire Station	21	4.3
Pulilan Fire Station	20	4.1
San Ildefonso Fire Station	20	4.1
San Jose Del Monte Fire Station	32	6.5
San Miguel Fire Station	24	4.9
San Rafael Fire Station	19	3.9
Santa Maria Fire Station	23	4.7
Total	493	100.0

The 493 respondents of Bureau of Fire Protection (BFP) - Bulacan were drawn from 24 fire stations across the 20 municipalities and 4 cities, and a Provincial Office with 16 total number of respondents. The City of San Jose Del Monte Fire Station had the largest number of respondents (32, 6.5% of the total sample), followed by Malolos City Fire Station with 30 respondents (6.1%). Doña Remedios Trinidad Fire Station, Hagonoy Fire Station, Obando Fire Station, and Paombong Fire Station have the least number of respondents with 14 (2.8%) respondents each. The remaining fire stations as reflected on Table 1 have a range of 15 to 29 respondents respectively.

Table 5

Frequency and Percentage of the Demographic Profile of Respondents

Sex	Frequency	Percent
Male	344	69.8
Female	149	30.2
Total	493	100.0
Marital Status		
Single	201	40.8
Separated	2	0.4
Widowed	4	0.8
Married (legal or consensual)	286	58.0
Total	493	100.0
Educational Status		
	Frequency	Percent
College Degree	463	93.9
Post-Grad Undergrad	8	1.6
Master's Degree	19	3.9
Doctoral Undergrad	2	0.4
Doctoral Degree	1	0.2
Total	493	100.0
Blood Pressure Category		
	Frequency	Percent
Normal	163	33.1
Elevated	266	54.0
Hypertension Stage 1	58	11.8
Hypertension Stage 2	6	1.2
Total	493	100.0
BMI Category		
	Frequency	Percent
Underweight	4	0.8
Normal weight	234	47.5
Pre-obesity	195	39.6

Obesity class I	54	11.0
Obesity class II	4	0.8
Obesity class III	2	0.4
Total	493	100.0
Waist-Hip Ratio Category	Frequency	Percent
Low	92	18.7
Moderate	20	4.1
High	381	77.3
Total	493	100.0
Perceived Health Status	Frequency	Percent
Poor	1	0.2
Fair	12	2.4
Good	132	26.8
Very Good	234	47.5
Excellent	114	23.1
Total	493	100.0

This research builds upon previous findings from studies conducted by Callaghan (2005), Arras, Ogletree, and Welshimer (2006), Waite, Hawks, and Gast (1999), and Larouche (2003). These studies have shown that various factors, including education, income, health insurance coverage, race, social support networks, religious practices, medical history, marital status, gender, age, and number of children, significantly influence health-promoting behaviors. Thus, the researcher sought the demographics of the respondents and Table 5 presents the frequency and percentage of the demographic profile of the respondents.

For the sex, results indicate that 344 respondents (69.8%) were male, while 149 respondents (30.2%) were female. Given that firefighters provide a vital service to our communities while being subjected to high levels of physical and psychological occupational variables, these results made sense. In this male-dominated field, female firefighters are a minority as they appear to be less willing to take risks than men (Cuesta et al., 2022). According to a study, women's opinions are likely to enhance firefighting safety practices (Rosca et al., 2021). According to a different research, men

firefighters were more likely than female firefighters to take risks (Bel-Latour & Graine, 2022).

For the breakdown of the participants' marital status, it was categorized into four distinct groups: single (40.8%), separated (0.4%), widowed (0.8%), and married legally or consensually (58.0%). Majority of the respondents were married, either consensually or legally, followed by respondents who are single as their marital status.

In terms of educational status, most participants (93.9%) hold a college degree, followed by those with a master's degree (3.9%). A small percentage of participants have completed post-graduate undergraduate studies (1.6%), doctoral undergraduate studies (0.4%), or a doctoral degree (0.2%). All the respondents are degree holders, as it is a minimum qualification requirement to be a member of the BFP that should be at least a bachelor's degree holder.

The distribution of blood pressure levels among the participants, were categorized as follows: normal (33.1%), elevated (54.0%), stage 1 hypertension (11.8%), and stage 2 hypertension (1.2%). The majority of respondents exhibited elevated blood pressure, with a significant proportion also classified as stage 1 or stage 2 hypertension. Cross-sectional studies have reported that firefighters have higher levels of BP and higher rates of hypertension compared to civilians. Interestingly, there is a limited amount of research that reports BP values before and after firefighting-related activities, and very few studies on interventional changes in BP (McMorrow & Fearheller, 2022).

For the respondents' BMI category, majority (47.5%) falling within the normal weight range. A significant proportion, 39.6%, are classified as pre-obese, followed by 11.0% as obese class I. A smaller percentage, 0.8%, are categorized as obese class

II, and only 0.4% are obese class III. While for the waist-hip ratio (WHR) category, the majority (77.3%) have a high waist-hip ratio, while 18.7% have a low waist-hip ratio, and only 4.1% have a moderate waist-hip ratio.

For the perceived health status, results show that a majority of participants (47.5%) rated their health as "very good," while 26.8% rated their health as "good," indicating a positive overall perception of health. Only a small minority, 2.4%, rated their health as fair, and an even smaller proportion, 0.2%, rated it as poor.

Table 6

Descriptive Statistics of Age, Length of Fire Service, Perceived Health Status, and Health Promoting Lifestyle Profile II and Subscales (n=493)

	Minimum	Maximum	Mean	Std. Deviation
Age	22	55	32.98	6.886
Length Of Fire Service	0.0	30.0	7.710	6.5717
Perceived Health Status	1	5	3.91	0.779
HPLP II Total Scores	52	208	141.01	27.956
HPLP II Stress Management	8	32	21.56	4.721
HPLP II Interpersonal Relations	9	36	25.48	5.165
HPLP II Nutrition	9	36	23.41	4.763
HPLP II Physical Activity	8	32	20.87	5.140
HPLP II Spiritual Growth	9	36	26.88	5.533
HPLP II Health Responsibility	9	36	22.82	5.469

Demographics play an important role in determining an individual's potential health problems. Table 6 summarizes the demographic and health-related characteristics of the study participants. The mean age of participants was 32.98 years (standard deviation [SD] = 6.886), with an age range of 22 to 55 years. The mean length of fire service was 7.710 years (SD = 6.5717), ranging from 0 to 30 years. The mean perceived health status is 3.91 (SD = 0.779), indicating a generally good perceived health. The HPLP total score averages 141.01 (SD = 27.956).

Table 7

Correlation between Age, Length of Fire Service, Perceived Health Status, and Health Promoting Lifestyle Profile II and Subscales

		Age	Length Of Fire Service	Perceived Health Status	HPL P II Total Scores	HPL P II Stress Management	HPL P II Interpersonal Relations	HPL P II Nutrition	HPL P II Physical Activity	HPL P II Spiritual Growth	HPL P II Health Responsibility
Age	Pearson Correlation	1	.867*	-.261**	-.114*	-.124**	-.056	-.105*	-.188**	-.085	-.070
	Sig. (2-tailed)		0.000	0.000	0.011	0.006	0.215	0.020	0.000	0.058	0.120
	N	493	493	493	493	493	493	493	493	493	493
Length Of Fire Service	Pearson Correlation	.867*	1	-.266**	-.062	-.068	-.021	-.051	-.148**	-.063	0.007
	Sig. (2-tailed)	0.000		0.000	0.168	0.134	0.640	0.262	0.001	0.165	0.877
	N	493	493	493	493	493	493	493	493	493	493
Perceived Health Status	Pearson Correlation	-.261**	-.266**	1	.217*	.242*	.185*	.182*	.235*	.218*	.124*
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.006
	N	493	493	493	493	493	493	493	493	493	493
HPLP II Total Scores	Pearson Correlation	-.114*	-.062	.217*	1	.946*	.924*	.909*	.886*	.890*	.896*
	Sig. (2-tailed)	0.011	0.168	0.000		0.000	0.000	0.000	0.000	0.000	0.000
	N	493	493	493	493	493	493	493	493	493	493
HPLP II Stress	Pearson Correlation	-.124**	-.068	.242*	.946*	1	.857*	.834*	.827*	.839*	.811*
	Sig. (2-tailed)	0.006	0.168	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	N	493	493	493	493	493	493	493	493	493	493

Management	Correlation										
	Sig. (2-tailed)	0.006	0.134	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	N	493	493	493	493	493	493	493	493	493	493
HPLP II Interpersonal Relations	Pearson Correlation	-.056	-.021	.185*	.924*	.857*	.1	.781*	.717*	.900*	.773*
	Sig. (2-tailed)	0.215	0.640	0.000	0.000	0.000		0.000	0.000	0.000	0.000
	N	493	493	493	493	493	493	493	493	493	493
HPLP II Nutrition	Pearson Correlation	-.105*	-.051	.182*	.909*	.834*	.781*	.1	.806*	.724*	.830*
	Sig. (2-tailed)	0.020	0.262	0.000	0.000	0.000	0.000		0.000	0.000	0.000
	N	493	493	493	493	493	493	493	493	493	493
HPLP II Physical Activity	Pearson Correlation	-.188**	-.148**	.235*	.886*	.827*	.717*	.806*	.1	.698*	.791*
	Sig. (2-tailed)	0.000	0.001	0.000	0.000	0.000	0.000	0.000		0.000	0.000
	N	493	493	493	493	493	493	493	493	493	493
HPLP II Spiritual Growth	Pearson Correlation	-.085	-.063	.218*	.890*	.839*	.900*	.724*	.698*	.1	.678*
	Sig. (2-tailed)	0.058	0.165	0.000	0.000	0.000	0.000	0.000	0.000		0.000
	N	493	493	493	493	493	493	493	493	493	493
HPLP II Health Responsibility	Pearson Correlation	-.070	0.007	.124*	.896*	.811*	.773*	.830*	.791*	.678*	.1
	Sig. (2-tailed)	0.120	0.877	0.006	0.000	0.000	0.000	0.000	0.000	0.000	
	N	493	493	493	493	493	493	493	493	493	493

** . Correlation is significant at the 0.01 level (2-tailed).

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

Table 7 shows the relationship between Age, Length of Fire Service, Perceived Health Status, and Health Promoting Lifestyle Profile II and Subscales of the Filipino firefighters in Bulacan. The results in the table revealed that amongst the demographic profile of the respondents, Perceived Health Status has significant correlation although weak correlation to Age, Length of Fire Service, and Health Promoting Lifestyle Profile II and Subscales. The Age of the respondents has significant correlation with Perceived Health Status ($r = -0.261, p < 0.01$); Health Promoting Lifestyle Profile II ($r = -0.114, p < 0.05$); HPLP II Stress Management ($r = -0.124, p < 0.01$); HPLP II Nutrition ($r = -0.105, p < 0.05$); and HPLP II Physical Activity ($r = -0.188, p < 0.01$) although weak correlation. But the Age of the firefighters has a very strong significant correlation with their Length of Fire Service ($r = 0.867, p < 0.01$). On the other hand, Length of Fire Service of the respondents has weak significant correlation with Perceived Health Status ($r = -0.266, p < 0.01$) and HPLP II Physical Activity ($r = -0.148, p < 0.01$).

The Health Promoting Lifestyle Profile II has weak significant correlation with Age ($r = -0.114, p < 0.05$) and Perceived Health Status ($r = 0.217, p < 0.01$). The relationship of Health Promoting Lifestyle Profile II to all of its six subscales (Stress Management $r = 0.946$, Interpersonal Relations $r = 0.924$, Nutrition $r = 0.909$, Physical Activity $r = 0.886$, Spiritual Growth $r = 0.890$, and Health Responsibility $r = 0.896$) has very strong significant correlation ($p < 0.01$).

Waite, Hawks, and Gast (1999) conducted a study utilizing the Health-Promoting Lifestyle Profile II (HPLP-II), which is grounded in Pender's Health Promotion Model, to examine the association between reported health status, sex, grade point average, and academic major with health-promoting lifestyles among a

sample of college students. Larouche (2003) conducted descriptive research to investigate the relationship between reported health status, sex, grade point average, and academic major with health-promoting lifestyles among college students.

Several studies show that perceived health status (PHS) is weakly correlated with demographic variables such as socioeconomic status and age. For example, Kraja et al. (2016) found that individuals in low socioeconomic groups in Albania reported poorer PHS, with smoking also identified as a significant determinant of poor health perception. Similarly, Noguchi et al. (2015) demonstrated a relationship between perceived health and factors such as age, employment, depression, life satisfaction, and social networks, suggesting that demographic and lifestyle factors collectively influence health perceptions.

In their study, Sarker et al. (2003) found that while age did not significantly influence job satisfaction, length of service (tenure) had a significant impact. They found that job satisfaction, including satisfaction with pay and benefits, was significantly influenced by tenure, but age moderated the effect of tenure on satisfaction. Silva et al. (2020) observed a weak negative correlation between length of service and physical activity levels among health professionals in Brazil. They found that professionals with longer tenure exhibited higher physical activity levels in both work and leisure contexts, suggesting that experience may promote greater physical engagement, potentially benefiting overall health.

Several studies highlight weak correlations between health-promoting lifestyles (HPLP) and age or perceived health status. Zheng et al. (2022) observed moderate levels of health-promoting behaviors among older adults in China. In another study, Zhou et al. (2022) found that factors such as age, education, and gender had a weak

association with health-promoting lifestyles. Additionally, Amiri et al. (2019) found that self-efficacy and well-being significantly influenced students' health-promoting lifestyles, while demographic factors like age, gender, and educational level were also correlated.

Meihan et al. (2011) observed significant positive correlations between the overall health-promoting lifestyle profile and perceived health, as well as quality of life. Similarly, Cheng et al. (2015) found that all subscales of the HPLP-II, including diet, physical activity, and stress management, exhibited positive correlations with self-rated health, ranging from moderate to strong.

Chapter V

CONCLUSION AND RECOMMENDATIONS

The study's relevant findings are presented in this chapter, along with their potential impact on the fields of nursing science, research, administration, and education. A collection of insightful findings and suggestions for more study are offered.

Summary

In the BFP Memorandum Circular No. 2024-023 dated 27 September 2024, 535 employees were profiled or assessed by the medical officers and staff of the Office of the Health Service during the Annual Medical Profiling of the BFP NHQ officers and personnel that was done in December 2022. Out of all the employees who were assessed, 151, or 28.2%, had a BMI that was within the normal range, 179, or 33.5%, were overweight, 79, or 14.8%, were obese, and 4 (or 0.75%) were extremely obese. Subsequent analysis revealed that the laboratory results exceeded the typical range typically found in each employee. The findings only indicated that malnutrition, particularly overnutrition, which includes overweight and obesity, is very prevalent in the BFP.

1. The study surveyed 493 respondents from the Bureau of Fire Protection (BFP) in Bulacan, representing 24 fire stations across 20 municipalities and 4 cities. The majority of respondents were from the City of San Jose Del Monte Fire Station ($n=32$, 6.5%), followed by Malolos City Fire Station ($n=30$, 6.1%). Demographically, the respondents were predominantly male

($n=344$, 69.8%) and married ($n=286$, 58.0%), with most holding a college degree ($n=463$, 93.9%). Personal health, a significant number of participants had elevated blood pressure ($n=266$, 54%), with some categorized as hypertensive ($n=58$, 11.8% stage-1; $n=6$, 1.2% stage-2). Regarding body mass index (BMI), $n=234$, 47.5% were in the normal weight range, while $n=195$, 39.6% were pre-obese, and $n=54$, 11.0% were classified as obese class I; 4 and 2 categorized as obese class II and III respectively. Majority of the WHR of the respondents was categorized as High ($n=381$, 77.3%) followed by Low ($n=92$, 18.7%) and Moderate ($n=20$, 4.1%).

2. The participants' average age is 32.98 years (SD = 6.886), with a range of 22 to 55 years. The average length of fire service is 7.710 years (SD = 6.5717), ranging from 0 to 30 years. The mean perceived health status is 3.91 (SD = 0.779), indicating a generally good perceived health status. Health-promoting behaviors, measured by the Health-Promoting Lifestyle Profile (HPLP), averaged 141.01 (SD = 27.956), indicating moderate levels of engagement in healthy behaviors.
3. This study explores the relationships between age, length of fire service, perceived health status, and the Health Promoting Lifestyle Profile II (HPLP II) among Filipino firefighters in Bulacan. The results show weak but significant correlations between perceived health status and age, length of service, and various subscales of HPLP II. Specifically, age correlates with perceived health status and several HPLP II subscales such as Stress Management, Nutrition, and Physical Activity, though these are weak

correlations. Age also strongly correlates with length of fire service. Additionally, length of fire service is correlated with perceived health status and physical activity. The HPLP II itself shows a weak significant correlation with both age and perceived health status, while its subscales have strong significant correlations with each other. This study's findings reinforce the significance of demographic factors as predictors of health-promoting behaviors, aligning with previous research. This emphasizes the importance of developing holistic health interventions that consider individual differences.

Conclusion

As an occupational group, uniformed people frequently encounter hazardous and stressful situations that increase the risk of disordered eating, which can have serious negative effects on someone's physical and emotional self. Furthermore, the psychological and physiological effects on obese military personnel include issues with neuromuscular and cardiorespiratory fitness, heat stress, sleep apnea, an increased risk of load carrying and musculoskeletal injuries, and mental health issues like depression symptoms.

In conclusion, the findings from this study highlight significant health concerns among firefighters in Bulacan, particularly regarding malnutrition, overnutrition, and elevated blood pressure, which are common among the Bureau of Fire Protection (BFP) personnel. The data indicates a concerning prevalence of overweight, obesity, and high waist-to-hip ratios, which, combined with weak but significant correlations between age, length of service, perceived health status, and health-promoting behaviors, underscore the need for targeted health interventions. The study's results,

showing moderate levels of activities in health-promoting behaviors, suggest the potential for improvement through tailored interventions focusing on how to manage stress, nutrition, and physical activity. The present findings underscore the necessity for nursing interventions that emphasize self-care and a holistic approach to health, particularly among middle-aged and older adults, as previously reported research has demonstrated the influence of demographic factors on health behaviors. It is recommended that community health nurses use these insights to guide programs that enhance self-efficacy and improve overall health outcomes for firefighters, ensuring that their physical and mental well-being is adequately supported.

Recommendations

For the Organization, the Bureau of Fire Protection (BFP):

Several health and wellness initiatives should be implemented to support the overall well-being of personnel. First, the organization should introduce comprehensive health screening programs that regularly assess key health indicators such as BMI, blood pressure, and blood tests. Establishing a baseline health profile for each individual and tracking changes over time would help monitor the health status of personnel and identify any emerging health concerns. Alongside this, healthy lifestyle programs should be promoted, including wellness initiatives focusing on nutrition, physical activity, stress management, and sleep hygiene. Educational materials and workshops can be provided to encourage healthy eating, regular exercise, and stress reduction, while also fostering participation in physical fitness activities and team sports.

Addressing nutritional concerns is also critical, so offering healthier food options in BFP cafeterias and canteens is essential. Additionally, providing nutrition

counseling for personnel with unhealthy eating habits and promoting mindful eating practices, including portion control, will help improve dietary choices. The organization should also prioritize mental health by offering counseling and support services to address stress, anxiety, and depression, creating a supportive work environment that encourages work-life balance and helps prevent burnout. Furthermore, BFP should implement policies to provide adequate rest and recovery for personnel, encouraging the use of vacation and sick leave to reduce the risk of burnout and ensure employees are well-rested.

In accordance with occupational health and safety regulations, the BFP must allocate resources for the procurement of personal protective equipment (PPE) and provide comprehensive training to its personnel to reduce exposure to hazardous substances and conditions. Ergonomic measures should also be put in place to reduce the risk of musculoskeletal injuries among personnel.

For future researchers:

There are several important areas to explore. Longitudinal studies should be conducted to track the long-term health outcomes of BFP personnel and assess the effectiveness of the implemented health interventions over time. Qualitative research could provide valuable insights into the underlying factors that contribute to unhealthy behaviors and barriers to adopting healthy lifestyles within the BFP, helping to refine future health programs. Finally, targeted interventions should be developed for specific subgroups, such as shift workers and those in high-stress roles, to address the unique challenges they face in maintaining their health.

For the nursing practice:

Nursing implications for the health and well-being of firefighters focus on a comprehensive approach that includes health screening, nutrition, physical activity, stress management, and occupational health. Health screening and assessment should be prioritized through regular health check-ups, including assessments of BMI, blood pressure, and laboratory tests to monitor firefighters' overall health. Identifying risk factors such as obesity, hypertension, and mental health concerns early allows for timely intervention and prevention of complications. In terms of nutrition and weight management, nurses can educate firefighters about the importance of a balanced diet, portion control, and limiting unhealthy food choices. Additionally, providing guidance on weight management strategies—such as calorie restriction and increasing physical activity—along with promoting adequate hydration, particularly during shifts or physical exertion, is essential.

To support physical activity and exercise, nurses should encourage regular exercise, including both strength training and cardiovascular activities. Special consideration should be given to developing exercise programs that accommodate shift work schedules, and education on injury prevention and proper exercise techniques should be provided. To enhance stress management and mental health, nurses can educate on stress reduction techniques, including mindfulness, meditation, and yoga. Additionally, they can assist in accessing vital mental health services, such as counseling and therapy. Peer support should be encouraged to foster camaraderie and create a positive work environment.

Occupational health and safety practices are significantly influenced by nurses. Their contributions include conducting ergonomic evaluations to pinpoint and rectify workplace dangers, guaranteeing the correct utilization of personal protective

equipment (PPE) to minimize exposure to harmful substances, and implementing strategies to alleviate the adverse health impacts of shift work. Finally, health education and promotion are critical components of nursing care. Nurses should provide tailored health education programs that meet the unique needs and literacy levels of firefighters. Health promotion campaigns and workplace wellness programs are crucial for improving the well-being of firefighters by increasing health awareness and promoting healthy habits.

Implementing these recommendations, the BFP can improve the holistic well-being of its personnel, leading to increased productivity, reduced absenteeism, and a healthier workforce. Through a collaborative effort that addresses these nursing implications, healthcare providers can contribute to improved overall health and well-being for firefighters, reducing their susceptibility to chronic diseases and occupational injuries.

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Appendices

APPENDIX A

Request Letter for BFP – Bulacan



UNIVERSITY OF THE PHILIPPINES
OPEN UNIVERSITY

30 September 2024

FSSUPT ERNESTO S PAGDANGANAN, DSC
Provincial Fire Marshal
Bureau of Fire Protection-Bulacan

Thru: **FCINSP MARICHELLE M COLLADO**
Deputy Provincial Fire Marshal
Provincial Chief Administrative Branch

Subject: Request for Approval and Support for Research Study Data Gathering

Dear **FSSUPT PAGDANGANAN**,

I am writing to formally request your approval and support for the conduct of a research study entitled "*Application of Pender's Health Promotion Model to Identify Health Risks of Firefighters in Bulacan: Implications to Nursing Practice.*" This research will be conducted by the University of the Philippines-Open University.

The purpose of this study is to identify the health risks faced by firefighters in Bulacan and to explore the implications of these findings for nursing practice. By understanding the health challenges of firefighters, we aim to develop targeted interventions and support services to improve their overall well-being. Among all other professions in the Philippines, who were working under extreme job nature, firefighters were left behind when it comes to research studies as proponents.

The research will involve gathering data using Health-Promoting Lifestyle Profile II thru Google Forms and actual measurement of their blood pressure and anthropometric measurements (weight, height, waist and hip circumference) of all uniformed personnel in Bulacan including the Provincial Office. The data collection process will be conducted in a manner that minimizes disruption to the daily operations of the BFP-Bulacan.

We believe that this research will contribute to a better understanding of the health needs of firefighters in Bulacan and will provide valuable insights for the development of evidence-based interventions. We are grateful for your consideration of this request and look forward to your positive response.

Thank you for your time and attention to this matter.

Sincerely,

(SFO1) Vie Mark A Venturina, RN
University of the Philippines-Open University

Enclosures:

- *Informed Consent*
- *Questionnaire*

APPENDIX B

Ethical Clearance



NATIONAL ETHICS COMMITTEE

Philippine National Health Research System
c/o Philippine Council for Health Research and Development
Department of Science and Technology

12 September 2024

VIE MARK A. VENTURINA, RN

Proponent
University of the Philippines – Open University
UPOU HQ National Highway, Brgy. Maahas,
Los Banos, Laguna

Study Title: **Application of Nola Pender's Health Promotion Model to Identify Health Risks of Firefighters in Bulacan: Implications to Nursing Practice**

NEC code: **2023-007-Venturina-Firefighters**

Subject: **Ethical Clearance Approval**

Dear **Mr. Venturina**:

This is to acknowledge receipt of the following documents on 05 August 2024:

1. Cover Letter (dated 05 August 2024)
2. Full Protocol (version received 05 August 2024)
3. Informed Consent Form, English version (version received 05 August 2024)

The National Ethics Committee conducted expedited review of the abovementioned documents and found that the recommendations have been adequately addressed. Hence, ethical clearance is granted, effective

12 September 2024 to 11 September 2025

If the study has not been completed within the effectivity of the clearance, you are required to apply for renewal of ethical clearance at least one month before its expiry, on or before **12 July 2025**. As a reminder, once the original ethical clearance has expired, data collection should be discontinued until extension of the clearance is given. As part of its monitoring function, the NEC requires submission of a midterm Progress Report after 6 months, specifically on 12 February 2025. Amendments to the protocol, informed consent form or questionnaires need to be submitted to the NEC for approval, while other concerns like protocol deviations shall be communicated to the NEC for information and guidance.

Finally, the NEC requires the proponent to submit a Final Report one month upon project completion. This report shall contain a summary of findings and other issues encountered during study implementation. All NEC forms are downloadable from the NEC website: nec.pchrd.dost.gov.ph.

Please be guided accordingly.

Very truly yours,

RICARDO M. MANALASTAS, JR., M.D.

Chair

APPENDIX C

Informed Consent Form



University of the Philippines Open University
INSTITUTIONAL RESEARCH ETHICS COMMITTEE

INFORMED CONSENT FORM

For: **Firefighters in Bulacan**

VIE MARK A. VENTURINA, RN (Researcher)
University of the Philippines-Open University
“Application of Pender’s Health Promotion Model to Identify Health Risks of Firefighters in Bulacan: Implications to Nursing Practice”

PART I: INFORMATION SHEET

INTRODUCTION

The firefighters/uniformed personnel of Bureau of Fire Protection (BFP) assigned in the province of Bulacan are the respondents of this study. As this research explores the respondents, it will gather information related to the objectives of the study from the respondents who will voluntarily participate. If any questions or needs for clarification about the study or the questionnaire/survey tool arise, the researcher is glad to accommodate and provide clarifications at any time.

PURPOSE OF THE RESEARCH

This study aims to apply the Health Promotion Model of Nola Pender (behavior and cognition towards health promotion) that will identify the health risks amongst firefighters in Bulacan through self-evaluation by answering the survey tool provided. Further, this study will identify the relationship of the firefighter’s characteristics and experiences, such as their demographic profile, to their perceived health risks. This will also determine the implications of the data gathered from the respondents to the nursing practice and cues to action in attaining wellness.

TYPE OF RESEARCH INTERVENTION

This is quantitative research that gathers qualitative data to generate comprehensive analysis of the research problem. Only a survey tool will be provided to the respondents of this study and there will be no intervention or experimentation to be conducted amongst them. A two-part questionnaire needs to be answered by the respondents that is composed of series of questions about the firefighter’s characteristics and experiences, health risks, and health promotion activities.

PARTICIPANT SELECTION

This study includes about 483 active firefighters from the Bureau of Fire Protection in Bulacan, currently stationed at fire stations across 24 cities and municipalities, as well as at provincial headquarters and auxiliary offices. A multi-stage sampling method will be used, including all personnel not in mandatory training and Non-Uniformed Personnel are excluded. A sample of 80% will be randomly drawn from each cluster (clusters are determined per station) using a draw-lot method.

VOLUNTARY PARTICIPATION

Participation in this research is voluntary and without any constraints. Respondents are to be chosen through clustered sampling to ensure randomization and unbiased selection. Whether



respondents choose to participate or not will never affect their job-related evaluations. Respondents are free to withdraw at any time without facing penalties or loss of benefits.

PROCEDURES

Data will be collected through a two-part questionnaire administered to respondents. The first part will gather demographic and experiential information, while the second will utilize the Health-Promoting Lifestyle Profile (HPLP) II. Additionally, participants will undergo physical measurements including blood pressure, height, weight, waist, and hip circumference. All questionnaires will be self-administered, with participants returning completed forms after a specified period. To ensure participant privacy, data collected will be strictly confidential and accessible only to the researcher. While respondents may opt to skip questions, complete responses are encouraged.

DURATION

Completing the three-part questionnaire, along with measurements of height, weight, hip and waist, and blood pressure, will take approximately 20 to 30 minutes. Following this, a ten-minute interview will be conducted. Participation will start upon signing the consent form and answering the questionnaire and will be marked as done once interview ends.

RISKS

This study involves no risks and/or discomforts on the part of the respondents, relatives, colleagues, and/or researcher since the data gathering procedures are in form of questionnaire and interview and free from any experimentation and intervention activities. There is no known risk in any form to anybody, yet a normal discomfort of uneasiness will encounter while answering the questionnaire due to prolonged sitting and being conscious as the interview takes place.

BENEFITS

The findings of this study can help identify areas where the health program for the agency needs improvement or where new programs are needed. The probability of developing fitness program could help firefighters improve their health habits and stay independent while doing their job. The study will provide clear conclusions and recommendations for improving nursing practices, especially for firefighters and emergency personnel. It will also encourage uniformed personnel nurses to get more involved in promoting and managing the health of firefighters.

REIMBURSEMENTS

Participation in this study is entirely voluntary and does not entitle respondents to receive rewards, compensation, or reimbursement for any expenses incurred. Since the survey will be conducted at the respondents' convenience during work hours and location, there are no anticipated expenses. Additionally, there is no provision for insurance or compensation of any kind for injuries that may arise during the survey period.

CONFIDENTIALITY

Privacy is important in this study. Respondents' identity and personal information won't be shared in any published materials. Since this research might make respondents stand out in the community, leading to potential stigma, in due respect, the researcher will take extra steps to keep everyone safe and anonymous. Respondents' consent and responses won't impact their job performance evaluations.



**University of the Philippines Open University
INSTITUTIONAL RESEARCH ETHICS COMMITTEE**

SHARING RESULTS

Upon data collection, the responses will undergo rigorous analysis. Findings may be disseminated through academic publications and conferences, subject to organizer approval. The research protocol has been reviewed and approved by the Institutional Research Ethics Committee (IREC) of the University of the Philippines Open University (UPOU) and the National Ethics Committee (NEC) to ensure ethical and academic integrity. To safeguard respondent anonymity, all identifying information will be strictly confidential.

RIGHT TO REFUSE OR WITHDRAW

Participation in this research is voluntary. Respondents have the option to decline participation or withdraw their consent at any time without facing consequences. However, participation and completing the survey are encouraged and will be greatly appreciated. Certain predictable circumstances, such as scheduled mandatory or specialized training, health leave, or other reasonable causes, may lead to termination of participation in the study.

DATA MANAGEMENT

All data collected for this study will be handled with strict confidentiality and securely stored electronically on the researcher's personal computer and an external hard drive. Access to the data will be limited to the researcher and the University of the Philippines Open University (UPOU), and only for research purposes. No biological samples will be collected, and no commercial products will be developed from this study. Participants will not receive any financial compensation. However, upon written request, participants or their authorized representatives may access individual or general study results once they become available.

WHO TO CONTACT

This study is self-funded research and the researcher is also the primary investigator. There is neither sponsor nor finance support from any entities to support the nature and source of funds.

Should you have any questions or concerns about this research survey/questionnaire, do not hesitate to approach or contact the researcher, **Vie Mark A. Venturina**, through this email address: <vim.venturina@gmail.com>, contact number 09166282008 or at Pandi Fire Station, Pandi, Bulacan.

This study has been approved by the University of the Philippines-Open University, any questions, and clarifications regarding this study, you may reach the UPOU thru:

UPOU Program Chair: **ASST. PROF. RIA VALERIE D. CABANES**
Address: UPOU Headquarters, Los Baños, Laguna
E-mail: riavalerie.cabanes@upou.edu.ph

In addition, this study has been reviewed by the National Ethics Committee, any questions, and clarifications regarding this study, you may also reach the NEC thru:

National Ethics Committee Chair: **DR. RICARDO M. MANALASTAS, JR.**
Address: DOST-PCHRD, Saliksik Bldg., DOST Complex,
Gen. Santos Ave., Bicutan, 1631 Taguig City
E-mail: nec@pchrd.dost.gov.ph



PART II: CERTIFICATE OF CONSENT

This section is mandatory

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked to have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

Print Name of Participant: _____

Signature of Participant: _____

Date [MM/DD/YYYY]: _____

If Illiterate

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Print name of Witness: _____

Signature of Witness: _____

Date [MM/DD/YYYY]: _____

Thumb print of
participant:

Statement by the researcher or person taking consent

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:

1. _____
2. _____
3. _____

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

Print Name of Researcher/Person taking the consent: _____

Signature of Researcher/person taking the consent: _____

Date [MM/DD/YYYY]: _____

Thank you for your support in this study. May God Bless You and have a nice day!

APPENDIX D

Research Tool



University of the Philippines Open University
INSTITUTIONAL RESEARCH ETHICS COMMITTEE

APPLICATION OF PENDER'S HEALTH PROMOTION MODEL TO IDENTIFY HEALTH RISKS OF FIREFIGHTERS IN BULACAN: IMPLICATIONS TO NURSING PRACTICE

Vie Mark A. Venturina, R.N.

INSTRUCTIONS:

- Please read and follow the instructions carefully.
- Do tick only one box that corresponds to your answer.
- **Blood Pressure:** A sphygmomanometer will be used along with stethoscope in order to get the blood pressure. Two readings will be taken with at least 30 seconds interval and provided in millimeter of Mercury (mmHg) unit and will record the average blood pressure. Observe the following before taking your blood pressure readings: (1) Don't eat or drink anything 30 minutes before you take your blood pressure; (2) Empty your bladder before your reading; (3) Sit in a comfortable chair with your back supported for at least 5 minutes before your reading; (4) Put both feet flat on the ground and keep your legs uncrossed; (5) Rest your arm with the cuff on a table at chest height; (6) Make sure the blood pressure cuff is snug but not too tight. The cuff should be against your bare skin, not over clothing, (7) Do not talk while your blood pressure is being measured.
- **Height:** The height (centimeter, cm) will be measured by standing up straight, shoeless with heels against a wall and arms hanging relaxed at their sides. A measuring tape was secured to the wall and height obtained by placing a level lightly on the crown of the head.
- **Weight:** The weight (kilogram, kg) will be measure using a weighing scale and standing up straight, breathe out, shoeless without any gadgets/accessories and arms hanging relaxed at their sides.
- **Waist Circumference:** the circumference (means the distance around) of the waist using a tape measure; measured by standing up straight and breathe out, measure the waist just above the belly button with a tape measure. The tape measure should not to pull too tight, take the measurement (centimeter, cm) where the ends of the tape measure overlap and record the waist measurement before moving on to the hips.
- **Hip Circumference:** the circumference (means the distance around) of the hips using a tape measure; measured by stand up straight and wrap a tape measure around the widest part of the hips. The tape measure should not to pull too tight, take the measurement (centimeter, cm) where the ends of the tape measure overlap.
- **Length in Fire Service:** the length of fire service will be the total years in the BFP from the date entered the fire service (BFP).
- **Familial History of Illnesses:** the respondent will tick the corresponding box for every illness if he/she has one or more than one family member that previously or currently diagnosed with that certain illness. The family members to be considered are mother, father, siblings, spouse, and children.

Participant's Name: _____ Unit Assignment: _____

I. INDIVIDUAL CHARACTERISTICS AND EXPERIENCES

Age: (in years, since last birthday) _____ Sex: Male Female

Marital Status: Single Divorced Separated Widowed Married (legal or consensual)

Blood Pressure: _____ Height in cm: _____ Weight in kg: _____

Waist in cm: _____ Hip in cm: _____
 (circumference above belly button) (circumference of the widest part of the hip)

Length of Fire Service:
 less than 5 years 5+ to 10 years 10+ to 15 years 15+ to 20 years more than 20 years

Educational Attainment:
 College Degree Post-Grad Undergrad Master's Degree Doctoral Undergrad Doctoral Degree

In general, would you say your health is:
1 Excellent 2 Very Good 3 Good 4 Fair 5 Poor

Presence or absence of illness:
 Where you ever diagnosed/hospitalized or have complaints due to following: (if Yes, answer if Present or Past Illness; Please check if there is any family history [mother, father, siblings, spouse, children])

	CURRENT	PAST	FAMILY HISTORY
Alcoholism/Drug Abuse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arthritis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asthma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blood Disorders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bone Diseases	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cancer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Depression/Anxiety/Bipolar/Suicidal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diabetes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emphysema (COPD)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heart Disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High Blood Pressure (Hypertension)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High Cholesterol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Migraine Headaches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pneumonia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Renal (kidney) Disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stroke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thyroid Disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

II. HEALTH-PROMOTING 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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That's conclude the questionnaire. Thank you for your participation. Have a nice day!

APPENDIX E

Curriculum Vitae



VIE MARK A. VENTURINA

Registered Nurse | Fire Officer | Educator

ABOUT ME

A professional equipped with excellent skills and comprehensive experience in hospital-based, community-based and organization setting with adept skills in emergency rescue, medical services and fire suppression, prevention, and investigation; with notable skills in arts, writing, graphic designs, and research."

EDUCATIONAL BACKGROUND

University of the Philippines - Open University

UPOU Headquarters, Los Baños, Laguna 4031, Philippines
Master of Arts in Nursing - Major in Adult Health
2013 - Present

STI College – Sta. Maria

Triple A Bldg. Poblacion, Sta. Maria, Bulacan 3022, Philippines
Bachelor of Science in Nursing
Graduate
2005 - 2009

Colegio de Sta. Monica de Angat

Poblacion, Angat, Bulacan 3012, Philippines
High School
2001 - 2005

Colegio de Sta. Monica de Angat

Poblacion, Angat, Bulacan 3012, Philippines
Elementary
1995 - 2001

LICENSURE

Philippine Nursing Licensure Examination

Professional Regulatory Commission, Philippines
June 6-7, 2009

Real Estate Brokers Examination

Professional Regulatory Commission, Philippines
March 17, 2013

ORGANIZATIONS

Philippine Nurses Association, Inc.

1663 F.T. Benitez Street, Malate, Manila, Philippines
Member

Philippines Association of Real Estate Boards, Inc.

Bulacan Real Estate Board, Inc.
Member

CONTACT

+63 916 628 2008
+63 977 260 0100

viemark_venturina@yahoo.com
vim.venturina@gmail.com

#82 Brgy. Encanto, Angat,
Bulacan, Philippines 3012

REFERENCES

MARICHELE M. COLLADO
Fire Chief Inspector
+63 932 868 9816

LESTER V. MANGAHAS
Senior Fire Officer
+63 925 622 1494

CARLO R. CAJIPE
Fire Officer 3
+63 997 930 9816

LANGUAGES

- ▶ Filipino
- ▶ English

WORKING EXPERIENCE

• **Bureau of Fire Protection** - Bulacan, Region III, Philippines

Senior Fire Officer 1

Pandi Fire Station Shift Team Leader, Municipal Chief Investigation and Intelligence Unit, Municipal Chief Emergency Medical Services (EMS), Lecturer, Building Plan Evaluator, Driver and Pump Operator, Fire Safety Inspector

December 1, 2009 - Present

- Knowledgeable in fire safety education and enforcement.
- Capable in administrative and operational procedures and processes.
- Proficient in rendering emergency rescue and medical services.

• **Colegio de Sta. Monica de Angat** - Angat, Bulacan, Region III, Philippines

Part-Time Senior High School Instructor

Pandi Fire Station Shift Team Leader, Municipal Chief Investigation and Intelligence Unit, Disaster Risk Reduction and Management; Practical Research; Inquiries, Investigation and Immersion

June 2017 – March 2019

- Knowledgeable in disaster risk reduction and management principles.
- Handling research subjects such as practical research and inquiries, investigation and immersion.
- Proficient in technical writing and research writing skills.
- Educator and transformative instructor

• **Gat. Andres Bonifacio Memorial Medical Center** - Delpan St., Tondo, Manila

Volunteer Nurse

October 12, 2009 - December 1, 2009

- Skilled in health promotion and disease prevention in hospital-based and community-based setting.
- Knowledgeable in educating patients for home care and discharge planning.
- Proficient in operating and monitoring bio-medical equipment and apparatus.
- Well-informed of medical terminologies and medication administration.
- Capable in maintaining sterile field and sterile application of dressing.

TRAININGS, SEMINARS AND WORKSHOPS ATTENDED

Introductory Course on Disaster Risk Reduction and Management in Health

Department of Health Academy

Mastering Analysis, Skills & Techniques in ECG Reading

University of the Philippines - Philippine General Hospital Division of Cardiovascular Medicine

Awareness Seminar on HIV and Other STDs

Bureau of Fire Protection - National Headquarters

Fire Detection & Alarm System (FDAS) Cause & Effect Matrix, Emergency Control Functions & Design Discipline Coordination

Institute of Electronics Engineers of the Philippines - Bulacan Chapter

Fire Arson Investigation and Inspection Course

National Fire Training Institute - Philippine Public Safety College

Old and New Perspective in Healthcare: Challenge of New Era

Ang Nars Kalusugan Para Sa Bayan

Fire Arson Investigation Refresher Course

Bureau of Fire Protection - Bulacan Provincial Office

Position Course of Incident Command System

Office of the Civil Defense - National Disaster Risk Reduction Management Council National Capital Region

Integrated Planning Course on Incident Command System

Office of the Civil Defense - National Disaster Risk Reduction Management Council National Capital Region

Basic Incident Command System Training Course

Office of the Civil Defense 3 - Regional Disaster Risk Reduction Management Council 3

Gender Sensitivity, R.A. 9262 and R.A. 7877

Bureau of Fire Protection - Regional Office 3

Gender Sensitivity Training

University of the Philippines - Massive Open Distance eLearning

40-Hour Seminar/Workshop on Fire Safety Inspection

Bureau of Fire Protection - Regional Office 3

Fire Basic Recruit Course

Fire National Training Institute - Philippine Public Safety College

Introduction to Technology for Teaching and Learning

University of the Philippines - Massive Open Distance eLearning

Teaching and Learning with Modern ICTs

University of the Philippines - Massive Open Distance eLearning

Blended Teaching and Learning Using OERs

University of the Philippines - Massive Open Distance eLearning

Basics of Resilience

University of the Philippines - Massive Open Distance eLearning

Risk Parameters, Hazard Assessment, and Framework and Policies on DRR-CCA

University of the Philippines - Massive Open Distance eLearning

Beyond Compassion: Diving into the Ethico-Legal Dimensions of Nursing Administration Amidst Current Issues and Trends

Our Lady of Fatima University

Overview of Public Health Surveillance and National Disease Surveillance in the Philippines

Department of Health (Academy)

Online Training on Basic Epidemiology

Department of Health (Academy)

Lessons and Algorithms on COVID-19 (LEARN COVID)

Department of Health (Academy)

Vaccine Demand Generation and Risk Communication

Department of Health (Academy)

Adolescent Health Education and Practical Training (ADEPT)

Department of Health (Academy)

Orientation on the Universal Health Care Law

Department of Health (Academy)

100 Shaping the Future with Nutrition

Nestle Nutrition Institute

NNC eLearning Course on Local Nutrition Program Management

National Nutrition Council

Emerging Clinical Nursing Education Series (ECNES)

St. Anthony's College

AWARDS AND RECOGNITIONS

SCHOLASTIC AWARDS

- Leadership Awardee (College)
- Outstanding Student (College)
- Best in Clinical Area (College)
- Best in Community Area (College)
- School Spirit Awardee (College)
- Academic Awardee (Elementary and High School)

CAREER AWARDS

- 30 Medalya ng Papuri
- 3 Medalya ng Pagtulong sa Nasalanta
- 8 Medalya ng Kasanayan
- 3 Medalya ng Kagalingan
- Unit Citation Badge
- Bronze Loyalty Awardee