JHS
ISSN 2599-5456

JOURNAL OF HEALTH SCIENCES

Vol. 4 No. 1
July 2021

A Peer-Reviewed Journal
Published Bi-annually by the
Adventist University of the Philippines

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Exploring the Life's Frustrations, Motivations and Successes of Older Persons

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Abstract

As humans advance in age, there are many personal factors that could determine whether or not an individual has succeeded well in life. Many has set a certain standard for themselves to meet, and in order to reach a certain goal there will be a time where an individual may not only lose motivation but also be frustrated as well. A qualitative descriptive study was used to explore the frustrations, motivations and successes in life of 22 purposively conversant, mentally, stable older persons aged 60-85 irregardless of their gender and educational attainment and without postural discomforts. Using a Collaizi's method in analyzing the data it was found out that the successes of older persons come first from their academic achievements as well as to their children and granchildren, followed by their spiritual maturity, successful marriage, material wealth and gotten age. What frustrates them most are their failure to do what they meed to do when they were still physically strong, then the failure of the individuals they financially support to pursue a degree, marital infidelity, and physical deterioration. Despite of the frustrations they experience in life they remain motivated to live longer because of their family, their desire to continuously serve God and man, their life healthy practices and pursue their unfulfilled goals.

Keywords: *frustrations, motivations, successes, older persons*

As humans advance in age, there are many personal factors that could determine whether or not an individual has succeeded well in life. Many have set a certain standard for themselves to meet, and in order to reach a certain goal there will be a time where an individual may not only lose motivation, but also be frustrated as well. The older persons have different ways to define whether or not they have succeeded in life. They have different perspectives in whether or not they have excelled well towards society. Some say that it is through the absence of medical disorders, illnesses or even being able to carry oneself despite of the age and complications (Kernisan, 2015).

In an older person's life where age is advancing and health is deteriorating, it is common to see the older persons struggle to keep their health as well as their physical abilities balanced. It has been stated that it is the feeling of being less a burden to their families that motivates the older persons to stay active; hence, the need to stay physically active and correcting eating habits to be more of healthier options (Bardach, S.H, Soenberg, N.E and Howell, B.M, 2015).

Others view successful aging as being able to go through the hardships of old age while encountering the illnesses and physical

complications. A sense of overcoming the difficulties of old age and health deterioration is what makes the older persons feel a sense of motivation and success (Kernisan ,2015). Although others view enduring the complications that the older persons go through as a success, some view it as a frustrating event, wherein acceptance of their health deterioration may be seen as a hindrance to doing activities they once did before. Some see their disorders and physical limitations as something that would burden their to family members or those taking care of them; hence why the older persons tend to refuse help from others (Burnetto, 2013).

In the eighth stage of Erick Erickson Theory, Ego Integrity Vs. Despair, states the older persons in this age tend to reminisce about the things they have done in life. When one is unable to reach a certain goal, the feeling of being unable to reach or master a certain task may lead the older persons to feel as if they are in despair, although if the older persons reminisce the about past and are content with the accomplishments they have done, then a sense of ego integrity may be felt by the elder persons (McLeod, 2018).

Since there is limited study on the detailed frustrations, motivations and successes of the older persons, and since older persons have many ways to find the means of motivation, a feeling of frustration and an elated sensation of success, therefore, the researchers are interested in exploring in full depth on what keeps the older persons going and what may hinder them from achieving their goals as they further advance in age.

Methodology

Research Design

A qualitative descriptive research design was used in the exploration of the older persons' idea regarding their frustrations, motivations and successes in life. A qualitative design was adopted because the point of qualitative research was to increase the information that could aid in informing the nursing practice generally and comprehensive, considerate that knowledge is ever changing and circumstantial, which means qualitative design or method will not concentrate on controlling components to detach explicit parts of a marvel. Or maybe, the strategies center around obtaining the most extravagant potential information – that is, information with the best unpredictability and assortment

Population and Sampling Technique

In selecting the informants from the population of older persons, a purposive sampling was used. Purposive selection of the informants is a technique in qualitative research in which the participants selected possess certain characteristics that enhance the believability of the investigation and it lets the specialist recognize criteria for the kind of source will light up the exploration question. This study utilized 22 older persons between ages 60 to 85, male or female, regardless of their educational attainment, who were conversant, mentally stable, and without postural discomforts, and who took their medications ahead of time prior to the interview.

Instrumentation

A semi-structured guide was used for the study. The interview consisted of a semi-structured questionnaires with open-ended questions to get information and their insights and their experiences about their successes, frustrations, and motivations in life. The researchers gave papers indicating questions like what are their successes, frustrations, and motivations in life and started interviewing them to express what they wrote and the interviewers also wrote down at the same time. The audio recorder was utilized to record the interviews.

Analysis of Data

In analyzing the information collected from the participants, a Collaizi's method served as a guide in transcribing and translating to identify the themes. During data analysis, the researchers made every effort to eliminate potential bias. Bracketing, verbatim transcription of taped interviews, and an independent reviewer was used to establish intersubjective agreement. Herewith is the diagrammatic presentation of the method:

Figure 1. *The Colaizzi Method*

There were 22 older persons who became part of the research study. The analysis of the information they shared began upon the commencement of the interview. The recordings of the audio were then written. Having to review the file repetitively may help gather important comments that maybe be identifiable with other themes. Re-reading their transcriptions several times helped extract the significant statements related to the themes identified to answer the research questions about the (1) life's frustrations of older persons, (2) life's motivations of older persons, and (3) life's successes of older pers

Ethical Considerations

The investigation was reviewed with the help of the Ethics Review Board of the University and all the information that the researchers gathered had an approval before it was released. To guarantee secrecy, the marked educated assent structures were kept separate from the transcripts. The recorded tapes and printed versions were secured in a bureau. Distinguishing data were erased and names were never utilized in any exploration reports. Audiotapes were crushed once the examination was finished. Sources were completely educated about the idea of the exploration and were shielded from mischief, thus, with their self-rule and privacy. It was clarified to them that they had the option to pull back from the exploration whenever they wanted to. Witnesses were guaranteed that their cooperation, or the data they gave would not be utilized against them. The sources additionally reserved the option to choose deliberately whether to take an interest in the investigation and without danger of bringing about unfriendly results. The researchers duties, and the potential dangers and advantages that might incur were presented to them as well. Those points were first expressed by words by the researchers and then presented to them through an informed consent and had them involved in the study, after they understood the purpose and benefits of the study.

Because anonymity was rarely possible with qualitative study due to a thorough involvement of the researchers and the comprehensive nature of the investigations, the investigators guaranteed the confidentiality of data unfolded unwittingly during the data collection. Extra precautions to safeguard the informants identities were done by not using fictitious names but also by withholding information about the characteristics of the informants, such as place of residence and occupation.

Results and Discussion

Upon interview with the participants, the researchers have concluded that each older person has a different perspective on the frustrations, motivations, and successes that they encounter in life. The findings are described below as:

The Life's Frustrations of an Older person

1. **None.** A greater majority of the participants claimed that they had no frustrations. They all agreed that it was better to focus on the positive side of life rather than worrying about the things that can't be changed anymore.
2. **Families Unfinished Degrees.** The other participants agreed that it was the failure of their family member, whether it be their children or their siblings that caused them to be frustrated by not attaining a degree.
3. **Regrets.** The participants that had regret wished they were wiser at their younger ages rather than fulfilling acts that were not to be beneficial in the future. They wished they could not have wasted much time doing unproductive things.
4. **Unfulfilled Degrees.** These participants were those unable to finish a degree they had wished to attain, or were unable to fulfill the degree they really wanted, in addition to that, these participants wished they fulfilled a course they dreamed of.
5. **Illness.** These participants found that having and illness was a great frustration to them.

They found that with these illnesses they tend to move slower and not feel like the way they were during their youth.

6. **Partners' Infidelity.** The participants mentioned here found that having an unfaithful partner was a frustrating part of their life, another mentioned that being unfaithful was frustrating to them because they knew they have caused pain to their partner.
7. **Death of a Spouse.** These participants found that losing a spouse was frustrating to them. Having to live the rest of their life knowing that their partner is no longer with them makes them quite anxious and lonely.
8. **Early Marriage.** This participant verbalized that marrying at a young age brought great frustration to them because of the opportunities that could have been taken, but was not able to because of an early marriage.
9. **Unfaithful Acquaintances.** These participants found that witnessing other people be unfaithful to a supreme being frustrated them greatly. Watching someone turn away from a supreme being rather than worship to ensure made the participants frustrated.
10. **Choose overseas work over Children's Welfare.** This Participant found it frustrating that they had to leave their children behind in order to provide a brighter future for their children.
11. **Neglect Self Care.** A participant voiced that having to take care of others rather than one's self is what they find frustrating. Having to take care of everyone in the family but themselves brought them great frustration.
12. **Being a Failure as a Mother.** These participants felt they could have done a better job in motherhood, especially in education. Motherhood is not an easy task, but is even harder when one feels that they have failed to be one.
13. **Fear of Being Alone.** Participants mentioned that they would not want to be left alone either. These participants showed great frustration when one leaves their side.

The Motivations of an Older Person

1. **Supreme Being.** A greater population of the participants agreed that having a connection with a supreme being is what motivates them to live longer and to serve him with all their might.
2. **Grandchildren.** These participants found motivation in seeing the upbringing of their grandchildren and watching them grow to be successful. They find joy in seeing their grandchildren becoming great people as they grow older.
3. **Healthy Lifestyle.** These Participants are greatly motivated by living a healthy lifestyle so that they can live longer. These participants found it important to have a balanced lifestyle as well as having a positive outlook on life.
4. **Children and Family.** These participants found that it is their children and family members that enabled them to live longer. Watching them grow and succeed in life brought much joy to their life. It motivated them to see their family succeed.
5. **Church ministry**. These participants verbalized that serving God in the Church is what motivates them. Having to do the works of the Lord made the participants feel somewhat involved and accomplished.
6. **Desire to accomplish goals before death.** As the participants age and nearing the face of death it is near death, it is their utmost desire to accomplish whatever goals they have set before their time will come to pass.

The Successes of Older Persons

1. **Children Finished Education.** These participants highly regarded the success of their children who attained their goals in successes in life. Seeing them finish their study and the stability of their career made them feel fulfilled.
2. **Successful Grandchildren.** Participants were happy to see their grandchildren growing and reaching, wherein they have success. Emulated the values passed on to them from their parents.
3. **Able to Support Academic Pursuits of the Family.** It was a great pleasure for the participants to see the fruit of their hard work by supporting their families pursuing their academic pursuits.
4. **Able to Perform as a Wife.** From the participant's view, being a good wife contribute success to the family. Women radiates a big influence for the growth and unity of the family.
5. **Finished College.** Finishing college is an open window to obtain a stable job where one can apply the knowledge gained and learned.
6. **Reaching Advanced Age.** It is the greatest joy of the participants of reaching the allotted life expectancy, surpassing the challenges and the hardships in life. Optimism has enriched the participants to attain a higher level of stability of their emotional, mental, physical, and spiritual aspects of their lives.
7. **Successful Marriage.** Successful marriage brought a great joy in keeping up with a healthy relationship within the family. Because of a healthy marriage relationship, it enabled them to cope up with life's difficulties and keeping one's affection intact.
8. **Gaining Property.** Acquiring property gives pleasure to the participants for they have seen the fruit of their labor and hard work.
9. **Spiritual Relationship.** High spirituality prove the true essence of life. Yielding oneself to God helped them to see a better future in life, strengthened family relationships and also a great example onto pass to the next generation.
10. **Church Ministry.** One of the secrets they found out in order to have a successful life is to serve and minister to the needs of other people. Selfless acts by helping the poor and needy brings joy to oneself. Serving or ministering to the church, helping other people in so many ways at the same time heightened their personal well-being.

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Antibacterial Efficacy of Solid Copper Alloys and Stainless Metals: A Literature Review

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Abstract

Elimination or control of the spread of bacteria is a major goal of health care providers in any health care setting. This study did a systematic literature review to determine the antibacterial efficacy of solid copper alloys and stainless metals. This was achieved by reviewing 10 experimental studies that were published from 2013-2020, in English, full text, in refereed journals, searched from ResearchGate, PubMed, ScienceDirect (Elsevier), and National Center for Biotechnology Information (NCBI) electronic databases. Copper alloy in all studies showed significant bacterial reduction in different environments (wet, dry, laboratory, health care setting) and proved to be effective against the pathogens that were grown on its surface. Stainless steel showed no significant reductions in bacterial contamination unless coated by a disinfectant agent such as alcohol or another metal with antimicrobial properties like silver. This literature review study showed that copper alloys have a stronger antibacterial efficacy compared with stainless metals. This provided a basis to reduce hospital acquired infection and contamination in the health care setting. Further, experimental studies should be done in a broader range of healthcare settings and environments, considering varied time of observation, in varied surface

Keywords: *antibacterial, solid copper alloys, stainless metals, literature review*

Elimination or control of the spread of bacteria is a major goal of health care providers in any health care setting. Many healthcare workers who work closely with patients, repeatedly touch surfaces such as railings, doorknobs, pens, tables, and more every shift. In these instances, microbes could easily be transferred around the hospital and into different patient rooms thus leading to potential risk for infection of the patient. Although it is a must for healthcare workers to always practice hand hygiene to kill off any unwanted bacteria, it is inevitable to escape the presence of bacteria on commonly touched surfaces within and outside the patient's room. Majority of the surfaces in health care industries are made of stainless steel which does not contain anti-microbial properties and can harbor bacteria for days or even weeks. In comparison to stainless steel, research has shown that copper contains anti-microbial properties and kills 99.9% of bacteria within 2 hours (Chyderiotis et al., 2018). Healthcare facilities especially in low to middle income counties, including the Philippines, are challenged in controlling infection (Mitchell et al., 2017). Although copper has been tested for its antimicrobial properties, research on its effectiveness on many varieties of bacteria are lacking and require further study to truly understand its significance of use in the healthcare setting. The researchers believe that with the review and analysis of many studies, a greater understanding on the antibacterial

effectiveness of solid copper alloys and stainless metals will be achieved with various bacteria. The aim of the study is to determine the antibacterial efficacy of solid copper alloys and stainless metals.

Methodology

The researchers used a systematic review of literature as research design. Purposive sampling were used in the study. Only those research articles that satisfied the inclusion criteria were retrieved, reviewed and included in the analysis. Those articles that appeared upon entering the key terms or combination of key terms (such as anti-infective agents, self-disinfecting copper alloys, stainless metals, antibacterial /antimicrobial effects), were published from 2013-2020 in English, in refereed journals and available in full paper were retrieved, reviewed and included in the analysis. Using the following databases ResearchGate, PubMed, ScienceDirect (Elsevier), and National Center for Biotechnology Information (NCBI) an initial 70 articles appeared upon entering the key terms. But after screening and evaluation of the articles using the set criteria only 10 articles were included in the study.

Results and Discussions

Copper alloy in all studies showed significant bacterial reduction in different environments (wet, dry, laboratory, health care setting) and proved to be effective against the pathogens that were grown on its surface. Stainless steel showed no significant reductions in bacterial contamination unless coated by a disinfectant agent such as alcohol or another metal with antimicrobial properties like silver. This literature review study showed that copper alloys have a stronger antibacterial efficacy compared with stainless metals. This provided a basis to reduce hospital acquired infection and contamination in the health care setting. Further, experimental studies should be done in a broader range of healthcare settings and environments, considering varied time of observation, in varied surfaces.

Table 1. *List of Literatures indicatinv Antibacterial Efficacy in Solid Copper Alloys and Stainless Metals*

Author	Title of the Study	Year	Country	Antibacterial Efficacy	
				Solid Copper Alloys	Stainless Metals
Knobloch, Johannes Karl	"Life-like" assessment of antimicrobial surfaces by a new touch transfer assay displays strong superiority of a copper alloy compared to silver containing surfaces	2017	Germany	Under ambient conditions, a copper alloy surface was able to stay almost sterile after 24h of incubation. Based off the data collected from the study, evidence shows that copper surfaces display a reduction of hospital acquired infections.	To mimic the environmental contamination via contact to human skin, ceramic tiles and stainless steel plates were used as a control. Results showed no significant reduction in bacteria in comparison to the copper surface.
Katrin Steinhauer	Antimicrobial efficacy and compatibility of solid copper alloys with chemical disinfectants	2018	Germany	Copper alloy carriers use in this study displayed a complete reduction indicating a reduction of >5log for P. aeruginosa and >4 log reduction for C. albicans. With the application of alcohol, the study also concluded that solid copper alloy surfaces and disinfectants synergize. Copper alloy discs were the surfaces in which the bacteria were inoculated on.	When comparing the efficacy of alcohol-based disinfectants on copper surfaces versus stainless steel, there was no difference in antimicrobial efficacy of the alcohol. However, without the application of disinfectant on the stainless steel, the study identified that there was no complete reduction of microbial contamination as compared to the copper surfaces where were much more affective on its own.
F. Pietsch	Selection of resistance by antimicrobial coatings in the healthcare setting	2020	Germany	Within 24h to 48h the formation of Acinetobacter calcoaceticus and Stenotrophomonas maltophilia was inhibited with containing only 57-96%.	Stainless steel only showed results when coated with antibiofilm.

Sarah L. Warnes	Inactivation of Norovirus on Dry Copper Alloy Surfaces	2013	USA	No infectious murine noroviurs was present after 30 minutes on copper. Inactivation of bacteria is 10 times faster in dry touch contamination.	No reduction of infectivity on stainless streel dry surfaces in simulated wet fomite and dry touch contamination.
Anna Różańska	Antimicrobial effect of copper alloys on Acinetobacter species isolated from infections and hospital environment	2018	Poland	The bacterial suspension density is significantly different depending on the copper alloy composition. In terms of bacterial effectivity, copper is much more effective in contrary to stainless steel. The result of copper showed a complete reduction of all of the five strains of Acinetobacter in less than 300 minutes.	Stainless steel was used a negative control which is assumed to lack antimicrobial properties. After 300 minutes, there was no exhibit reduction in Acinetobacter strain in stainless steel.
Schmidt et al.	Self-Disinfecting Copper Beds Sustain Terminal Cleaning and Disinfection Effects throughout Patient Care	2019	United States	Copper alloy is able to sustain the microbial burden. Metallic copper surfaces kill bacteria through a multimodal mechanism involving the ability to disrupt bacterial respiration, generate superoxide, and destroy genomic.	Stainless steel has no antibacterial efficacy.

Sifri et al.	Reduced health care-associated infections in an acute care community hospital using a combination of self-disinfecting copper impregnated composite hard surfaces and linens	2016	United States	Copper has potent biocidal activity.	Stainless steel without being impregnated with copper has no significant ability to reduce bacteria.
Michels et al.	From Laboratory Research to a Clinical Trial: Copper Alloy Surfaces Kill Bacteria and Reduce Hospital-Acquired Infections	2015	United States	Limited placement of copper alloy surfaces within the built environment resulted in an average 83% reduction of bacterial burden and 58% reduction in the incidence of HAI.	Stainless steel has no known antimicrobial effect. Microbes have an intrinsic ability to survive on commonly touched with non-antibacterial surfaces.
Villapun et al.	Antibacterial metallic touch surfaces	2016	United Kingdom	Copper alloy mixed with silver enable improvements in the anticorrosion performance and durability of copper while maintaining good antimicrobial activity.	Stainless steel may not effectively prevent the transmission of bacteria because it does not possess inherent antimicrobial activity.
Kawakami et al.	Effects of surface contamination and cleaning with hypochlorite wipes on the antibacterial activity of copper-alloyed antibacterial stainless steel	2014	Japan	Bacterial counts significantly decreased when the contaminated sopper alloy specimens were subjected to cleaning with sterile wipes loaded with sodium hypochlorite solution.	Stainless steel is not antibacterial: pathogens remain viable on stainless steel surfaces and present a contamination hazard for considerable periods of time.

Throughout the literature review, the main subject of the discussion focused mainly on the effectiveness of the antimicrobial properties of copper alloys rather than stainless metals. In fact, stainless metals were used as control group to be compared to the efficacy of copper (Knobloch et al., 2017). Every study that involved the antimicrobial properties of copper resulted with significant a reduction of pathogens on its surface within a given time frame. With or without chemical disinfectant it has been proven that copper yields strong properties that can fully reduce the population of pathogens such as P. aeruginosa or C. albicans in dry conditions (Steinhauer et al., 2018). Furthermore, it had been found that copper kills bacteria much faster on dry surfaces compared to wet surfaces, however in another study it showed that copper completely reduced the amount of S. enterica under wet conditions after 0.5-2h contact. The overall evidence of the antimicrobial properties of copper are very distinguishable based on these previous studies.

In comparison to copper alloys, stainless metals were proven to not show a significant amount of bacterial reduction. In many researches, stainless metals were used as control measure to determine the efficacy of metals such as copper that have antimicrobial properties (Knobloch et al., 2017). It was only mentioned that when fused with a metal with antimicrobial properties did stainless steel demonstrated an affect on a the bacteria S. aureus, however there are no studies done in the actual hospital setting with stainless metal coated in antimicrobial metal such as silver (Weber & Rutala, 2013).

By evidence-based research journals, there is no question of the significant difference in antibacterial efficacy between copper alloys and stainless metals. Copper by itself without added chemical disinfectants had decreased the population of selected pathogens on its surface by a huge margin. Additionally, the studies showed that there is a strong synergism between solid copper alloy surfaces with a disinfectant base (Steinhauer et al., 2018). Unfortunately, stainless metals was never the main subject of the studies but rather as a comparison to copper or as a test metal to be coated by another metal with antimicrobial properties or chemical disinfectants.

It is then recommended that for the hospitals or healthcare institutions to consider the use of copper alloys equipment over equipment made of stainless metals. More experimental studies in a broader range of healthcare settings and environments. Future studies will need to consider numerous variables, including the antimicrobial concentrations present in coatings, the disinfectants, the occurrence of biofilms on surfaces, and the humidity relevant to dry-surface.

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Analysis of the Water Intake and Sedentary Behavior of a Sectarian University Employees

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Abstract

Drinking enough water is essential to the human body to function well. Sedentary behavior is a contributing factor to high body mass index that leads to different chronic diseases and conditions. These two are commonly neglected by workers because of their busy schedule, deadlines and several hours of working. The purpose of this study is to assess the health practices of workers in Sectarian University regarding the water intake and sedentary behavior. A total of 171 respondents answered the survey questionnaire completely during the workers' meeting on November 9, 2018. Results showed that 12% of the workers drink 0-2 glasses of water only during their eight hours of work and only 50% of the workers drink 8-12 glasses per day. Availability of water was not accessible to 21% of the employees. Moreover, result presented that 55% of the employees showed a sedentary time of 5 hours and above. They have their breaks every 1-2 hours, and 76 % of worker's activities during breaks were also sedentary. Their activities were napping, eating, reading, texting, or internet surfing. The researcher concluded that AUP workers did not meet the daily requirement for water intake and sedentary behavior was observed. These results lend ideas for future researches about the correlation of water intake to work productivity and relation of sedentary time to age and sex.

Keywords: *sedentary, drinking water, workers, breaktime activities*

Water is essential to one's life. One major key to survival is through hydration or water. Humans cannot live one week without water. Total body weight of a normal adult contains 60-70% water and our brain contains 73% (Mahan & Raymond, 2016). Being hydrated or inadequate hydrated can affect how person feels and how person will perform. According to the National Hydration Council (NHC, 2016) in UK, staying hydrated will help people in improving their work productivity, helps them to perform better in mental and physical aspects and also helps to offset possible safety risks. Food and Nutrition Board of the Institute of Medicine (IOM, 2005) released a minimum of total fluid intake in about 3.7 liters (15 cups) for men and 2.7 liters (11 cups) for women each day. Water requirement cannot be achieved only by pure water intakes because fluids can be available from food and other beverages. National Health Services (NHS, 2016), recommended the pure water minimum requirement which is 8-12 glasses of water each day equivalent to 2.5 liters for male and 2.2 liters in female. There is a misconception that everyone needs to know. People on a warm to hot environment needed

more water and that people staying on cold room does not. Yes, it is true that more perspiration, the more water intake is needed (Mahan & Raymond, 2016) but on the other hand, cold rooms also results to dehydration. The air conditioning is absorbing the moisture and water of the skin and eyes resulting to dry skin, lips, and eyes (Kleyne, 2015). Office settings are commonly situated in an air-conditioned room. In that case, office workers tend to forget to be hydrated because of the temperature and the frequency of urinating. Moreover, water is essential to intellectual performances. Mild dehydration can interrupt the cognitive functions which includes concentration, short-term memory, alertness and also influenced the mood of a person (Popkin et al., 2010).

Sedentary behavior (SB) described as time spending on low energy activities like sitting, lying down, watching television and driving (Owen et al., 2010). It is often connected to work in office settings, transporting or driving (Pandey et al., 2016). Technological advances are increasing and the common workstations are now dependent on various technologies like computers. The working population especially in office settings has the higher occupational exposure to SB due to long hours of sitting in their computers and desk (Owen et al., 2010). Prolonged SB increased the risk for all-cause mortality, various chronic conditions and higher body mass index (Waters et al., 2016). A study (Pandey et al., 2016) found out that long sedentary time is related to cardio-vascular diseases independent on any physical activity. It means that even you are doing exercise in a regular basis, but your sedentary time is prolonged, it will affect your health (Owen et al., 2010). Most of these workers also go to their work with their vehicles increasing their sedentary time. In addition, leisure time and breaks also contributes to their prolonged sedentary time (Waters et al., 2016). Short and frequent breaks from sedentary activity can be a help in reducing sedentary time at work for employees (Mailey et al., 2016). In the increasing rate of diseases among working adults, health promotion in the workplace is not just an option but a priority in every company or organization (WHO, 2018). Working adults spend an average of 54% of their waking time at work based on the American Time Use Survey (BLS, 2018) and the workplace becomes their second home. Because of this, World Health Organization (WHO, 2018) emphasizes the importance of workplace health promotion (WHP) in any organization. Employers have the responsibility to their employees to provide healthy environment and policies or programs that promotes health (DOLE, 2017). The goal of the health promotion is to ensure employees' wellbeing in the workplace through improving of work environment and various health promotion programs that is offered in the workplace itself (Andersen et al., 2015). Bazzani and Sanchez (2016) defended the significance of WHP based on the evidence that a healthy work environment promotes workers health, improves productivity and quality of life. Employees have a right to have a healthy environment in the workplace whatever position they have (DOH, 2017). One study (Eng et al., 2016) showed that even in a low intensity health promotion program, employees that participated improved their health problems.

Water intake and sedentary behavior especially in workplace are public health concerns that being neglected by people. Because of this, analyzing health practices of employees are significant to make appropriate programs or interventions tailored for them. These results will help the respondents' awareness regarding health as their priority despite of heavy workloads and busy schedule.

Methodology

The research used the descriptive method to assesses the practices among workers of a sectarian university regarding their water intake and sedentary behavior.

This study utilized the purposive and total enumeration sampling technique to identify the respondents from the selected sectarian university. Respondents are from eight different departments that includes the administration office, maintenance, food services, graduate school, public security, academy, elementary, student services, guidance, finance, records and admission office. The nine colleges were also included such as the College of Health, Business, Arts and Humanities, Nursing, Science and Technology, Education, Theology, Dentistry and Medicine. There were 228 workers who originally participated on the survey however, only 171 workers answered the questionnaire completely. Therefore, 171 were the respondents who participated on the study of which 31% were males and 69% were females.

The survey is a 9-questioned questionnaire that was compiled from different existing questionnaires about the health-related practices in workplace specifically water intake and sedentary behavior. Four questions on water intake which was about the numbers of water intake daily and during work hours, what they used for drinking and the availability of water source within their offices. The five questions were on sedentary behavior such as the number of hours spent on their workstations, frequency of breaks, the activities during break time, and the means of transportation going to work. It was revised according to what the researchers need to know and it was validated.

It was a one-day data gathering that was done during the employees' meeting happened on November 9, 2018. All workers who attended the meeting are requested to answer the questionnaires.

The study utilized the analysis of data using frequency, percentage and getting the mean, and standard deviation.

The researcher explained the purpose of the study to the respondents and they were informed that their participation was voluntary. The researcher did not ask their names to ensure the confidentiality and anonymity of the respondents and it was explained to them that the results of the data will be in an aggregated form.

Results and Discussion

The result of the survey questionnaire intended to assess the practices on water intake and sedentary behavior of the workers of the sectarian university. It will be a basis on future health promotions and programs.

Water Intake

The researcher asked the respondents about how many glasses of water they drink during working hours and each day. The result showed that they had an average of 5-6 glasses during their working hours approximately 26% of the participants. About 35% of the workers drink 3-4 glasses, 10% drink 1-2 glasses and there were 2% who drink nothing during the whole hours of working. There was a total of 12% of the participants who drink zero to two glasses of water while working.

Table 1. *Water intake of the university employees during working hours*

No. of glasses	No. of Respondents	Percentage
None	4	2%
1-2	17	10%
3-4	59	35%
5-6	44	26%
>6	47	27%

Table 1 showed the total average of 6-7 glasses they drink each day. Only 50% of the participants drinks at least 8-12 glasses per day while the other 50% did not. This means that half of the workers were lacking hydration throughout the day. According to the study of Popkin et al. (2011), hydration can affect daily performance of an individual.

Table 2. *Water intake of the university employees per day*

No. of glasses	No. of Respondents	Percentage
2-3	15	9%
4-5	25	15%
6-7	46	26%
8-9	55	32%
10 and above	30	18%

In this section showed about 43% of the participants used reusable water bottle, 14% still used disposable bottled water, 6% were using disposable cups, and 37% were using mugs or glasses for drinking. This can affect the frequency of drinking while working.

Table 3. *Types of containers used for drinking*

Type of Container	No. of Respondents	Percentage
Disposable bottle	24	14%
Reusable bottle/Tumbler	73	43%
Disposable cup	10	6%
Mugs/glasses	64	37%

The table was about the availability of drinking water on their offices or department area. There were about 71% of the respondents answered that water were constantly available in their office, 8% answered that availability was not consistent and 21% who answered that source of drinking water was never available in their office. Occupational safety and health administration stated that providing potable drinking water is the responsibility of the employer to all of the employee. It is in the law that all of the workers must have an access to clean drinking water.

Table 4. *Water Availability in the Office*

Water Availability	No. of Respondents	Percentage
Always	122	71%
Sometime	13	8%
Never	36	21%

Sedentary Behavior

This section showed the number of hours the workers spend in their working computer or table which indicates a sedentary behavior. About 8% of the participants spend 9 hours and longer in their working table or computer; 14% spend 7-8 hours; 34% spend 5-6 hours in their desk; 30% spend 2-4 hours, and 15% of the respondents spend only 2 hours in their desk table or computer. Prolonged sedentary time can give the body several harmful biological consequences (Owen et al.,2012). This resulted that 56% of the respondents were in risk of sedentary behavior that can lead to various health problems.

Table 5. *Hours spent in working*

Hours spent working	No. of Respondents	Percentage
Less than 2	25	15%
2-4	51	30%
5-6	57	34%
7-8	23	13%
9 & above	14	8%

It is significant to know the nature of the work of the workers. They were asked how many percentages of sitting, walking and standing on the span of their working hours. Personnel spend an average of 48% of their time at work in sitting position, 30% in standing and 22% in walking. A lot of research done telling too much sitting is related to overweight and obesity which would be health risk on different chronic diseases.

Table 6 *Percentage of activity during working hours*

	Sitting	Standing	Walking
Mean	47.9	29.6	22.1
Standard Deviation	23.1	18.1	16.2

During working hours employees are allowed to have several breaks. The frequency of their breaks and what activities during this time can determine sedentary behavior of a person. The table showed that there were 39% of the workers taking their breaks every one hour; 31% were having their breaks every 2 hours; 15% were taking their breaks every 3 hours; 4% were taking breaks every 4 hours and there were 11% who takes their breaks during the lunch time only. The researcher also asked about the activities they do during these breaks and found out that 76% of the participants' activities during break time were also sedentary such as reading, eating, chatting, napping, texting, internet surfing and this includes the workers with no breaks. There were only 23% who walked during their breaks. In the study of Jalayondeja et al. (2017), stated

that personnel who did breaks more than twice each day had a 41% less risk non communicable diseases (NCDs) and cardiometabolic risk factors (CMRFs). Hence, those individuals who took active breaks were unlikely to have the NCDs and CMRFs. Regardless of any physical activity, prolonged sedentary time was independently related with harmful health results (Biswas et al., 2015). They recommended having breaks during sedentary activity at least every two hours and it must be physical activities that require energy like walking or exercising while in chairs.

Table 7. Frequency of breaks from sitting

Frequency of breaks	No. of Respondents	Percentage
Every 1 hour	67	39%
Every 2 hours	53	31%
Every 3 hours	26	15%
Every 4 hours	6	4%
Lunch break only	19	11%

Table 8. *Activities during breaks*

Activity	No. of Respondents	Percentage
No break	17	10%
Reading	20	11%
Eating	34	20%
Chatting	27	16%
Texting/Internet surfing	19	11%
Napping	12	7%
Walking	39	23%
Others	3	2%

In one study (Owen et al., 2012) explained that sitting during transport is also considered as sedentary behavior. It is whether an individual commutes or driving their own vehicle. The table illustrated that 61% of the personnel were using their vehicles going to work, 32% were walking, 5% were riding their bicycle and 2% were using both vehicle and walking as a transportation to the workplace. A total of 39% of the workers were actively done physical activity in their means of transportation in their workplace. However, a big percentage of the workers with 61% were dependent on their vehicle going to work whatever the distance of their home from their work offices.

Table 9. *Means of Going to Work*

Frequency of breaks	No. of Respondents	Percentage
Every 1 hour	67	39%
Every 2 hours	53	31%
Every 3 hours	26	15%
Every 4 hours	6	4%
Lunch break only	19	11%

The results indicate that sedentary behavior was seen on the AUP employees' specifically during work hours. Despite of the busy schedule they were taking their rest breaks which can help employees to be more productive and creative. The workers will be more focused, engaged more to their work and allows them to complete their responsibilities more accurately and lessen the workers' error (Ferguson,n.d). Unfortunately, their breaks were not physical activities that requires energy rather, they were also sedentary actions which was added to their sedentary time. The risk for several diseases caused by long sedentary time was high for these workers despite their frequent break times. There were evidences about the association of sedentary behavior to all-cause mortality including cancer, cardiovascular diseases and diabetes. These consequences are more pronounced among individuals who are physically inactive (Katzmarzyk et al., 2019). Workers did not meet the daily minimum requirement of water intake. They were prone to dehydration in spite of the availability of water resource within their offices. Decrease in water intake can affects the change in mood and physiological sensations in adults. It can also reduce the calmness, satisfaction and positive emotion of the workers (Pross et al., 2014). The use of cups, mugs or glasses for drinking can be one of the factors why they were deficient in water intake. It takes a lot of effort to get water frequently from the sources during the intensity of their workloads. It increases their risk for any diseases related to lack of water or dehydration.

The need for promotion of health in workplace was clearly essential and extremely significant for the benefit of the employees. The results recommended that administrators needed to provide awareness about health in the workplace. In specific, information must be learned by employees about the water and its health benefits. The risk and the detrimental effects of sedentary behavior must be explained and how to decrease these health risks. Productivity of workers is affected by different factors. It can be environmental, physical, and organization aspects and it is the duty and responsibility of employers to provide a safety and healthy environment in workplace for their employees. These will not only benefit the workers but also be beneficial to employers because it will increase the worker's productivity, mental capabilities and better work ethics. Further research and study are encouraged about the correlation of water intake to work productivity and relation of sedentary time to age and sex.

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Motivational Factors Towards Self-Directed Learning Among Nursing Students in an Online Environment During Covid-19

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Abstract

The Coronavirus Disease 2019 (COVID-19) pandemic has caused a global paradigm shift towards online learning. The urgency of social distancing due to the rapid spread of the virus led to a global distance learning test on an unprecedented scale. Therefore, nursing students need to adopt good self-directed learning practices. This descriptive-correlational study aimed to investigate the level of academic motivation and the extent of self-directed learning practices among nursing students in an online learning environment. The study also examined the relationship between academic motivation and self-directed learning practices. One hundred and twenty third- and fourth-year nursing students from two selected universities were conveniently sampled to answer a structured survey questionnaire. The statistical treatment used was the mean and standard deviation, and Pearson Correlation. The reliability of the instrument showed that academic motivation had a Cronbach Alpha of .932 and self-directed learning practices were .851. The results showed that nursing students' academic motivation was high (M=3.04, SD=0.737) with both intrinsic and extrinsic motivation being high respectively. The extent of self-directed learning practices among students was scaled as sometimes (M=3.108, SD=0.7107) which involves performing other activities instead of engaging in study materials. There was a moderate positive significant relationship between academic motivation and self-directed learning practices. The study recommends that nursing educators employ nursing students' strategies to improve their self-directed learning strategies in an online environment. Secondly, further researches should be done utilizing other variables with a larger population to determine the relationship towards self-directed learning.

Keywords: *academic motivation, self-directed learning practices, online learning environment, nursing students, nursing education*

AThe Coronavirus disease 2019 (COVID-19) pandemic caused a global paradigm shift towards online learning. According to Sun, Tang, & Zuo (2020), the urgency of social distancing due to the rapid spread of the virus led to a global distance learning test on an unprecedented scale. The sudden shift towards adopting online learning poses a question on whether this would continue post-pandemic.

In 2010, the American Nurses Association (ANA) acknowledged the advantage of e-learning. As a future nurse develops, nursing education should develop (Khalaila, 2015). Curricula should be intended to prepare properly qualified nurses at the entrance level. The constraints of nurse shortage and program capability require an

effective process of education. Online, virtual, simulated, and skill-based learning are efforts to improve student possibilities and effectiveness. (Mekler, Brühlmann, Tuch, & Opwis, 2017).

According to Cerasoli et al. (2014), the ANA's Scope and Standards of Practice Standards stated the need for e-learning in nursing education to utilize technology to evaluate, record, and collect information from healthcare consumers, execute the nursing process and improve nursing practices. Secondly, utilize information technology to communicate health promotion and illness prevention to consumers in many settings. These illustrate the need for nursing education for e-learning.

Abeysekera and Dawson (2015) stated that due to the increasing need for online learning in Finland, most universities and applied sciences university identify e-learning as a significant area of growth. The nation has a lengthy history of distance teaching beginning in 1986 and eLearning beginning in 1998. As such, Finland is one of the world's leaders in the use of information technology in the teaching setting

Hanus and Fox (2015) expressed that e-learning provides an effective way of meeting the needs of diverse learners, but it also includes a unique style of learning for the millennial generation of learners through technology. E-learning uses technology to improve teaching for non-traditional learners. E-learning is an active learning process, placing responsibility on the learners themselves. In nursing, technology offers learners the opportunity to learn in a convenient environment. Technology also promotes fundamental abilities and critical thinking abilities that make teaching and learning more creative and flexible. Nursing education has incorporated e-learning such that includes simulation, online group board discussion, synchronous and asynchronous teaching. To improve self-directed learning among nursing students, nurse educators function as facilitators of learning, creating an environment and culture to develop self-directed learning. (Gerhart and Fang, 2015).

To gain further insights into online education during the COVID-19 pandemic, a study was conducted by Sun et al. (2020) among 39,854 students at Southeast University in China. The study should that 50% of the participants believed that the planned teaching and class objectives were obtained. Additionally, the participants perceived that their teachers brought positive energy to the online sessions. However, 80% of the students were unmotivated and lacked focus, which was evident in their low-test scores. The authors concluded that there is a need to improve self-discipline among the students to yield positive academic outcomes.

Also, Phillips et al. (2015). E-learning has modified the learning environment's preconditions. Learners are expected to change their attitudes towards the new learning environment, develop creative learning skills, self-discipline, and consider their learning needs and intentions. All these preconditions determine users' contentment and the level of adoption of the new educational environment (Alotaibi, 2016). Therefore, adopting good self-directed learning practices is important for nursing students. Self-directed learning strategy that is one of the latest trends in learning. Self-directed learning is an academic method in which learners with the teacher's guidance determine what and how to learn. Nonetheless, the student's academic motivation will impact self-directed learning strategies,

A study was conducted by Erten (2014). To determine the relationship between motivation, age, and academic stress towards readiness for self-directed learning. The research used 186 students in an online university in Korea, taking a therapy course. The study showed that there was no significant relationship between age and self-directed learning readiness. However, motivation and academic stress related significantly to self-directed learning readiness.

Although the study established a significant relationship between motivation and self-directed learning readiness, the population sample used was not nursing students. Secondly, the study utilized the variable of self-directed learning readiness, failing to examine the student's self-directed learning practices.

There are limited studies that have examined nursing student's self-directed learning practices in an online educational environment. Secondly, limited researches have examined the relationship between academic motivation and self-directed learning practices of nursing students. Having identified these gaps, this study seeks to examine the influence of academic motivation on self-directed learning practices in an online-educational environment among nursing students. It further answers these questions:

1. What is the respondents' level of academic motivation in terms of
    a. Intrinsic Motivation
    b. Extrinsic Motivation
2. What is the extent of the respondent's self-directed learning practices?
3. Is there a significant relationship between academic motivation and self-directed learning practices?
4. Is there a significant difference in terms of self-directed learning when considering
    a. Sex
    b. Year Level

Hypothesis

1. There is no significant relationship between academic motivation and self-directed learning practices.
2. There is no significant difference in terms of self-directed learning practices when considering
    a. Sex
    b. Year level

According to Gupta and Mili (2016), academic motivation is the driving force behind the students ' desire to practice. The academic motive is a pillar of educational achievement as it is a student's ability or desire to perform according to the expectations in an educational activity (Khalaila, 2015). Depending on the environment, educational background, and amount of concern, students face different motivations (Alt, 2015). Cerasoli et al. (2014) describe motivation as a force that reinforces attitude, leads to behavior, and causes a continuous tendency.

The account points out that people need to be extremely rigorous and precise about their determinations to achieve assured goals. In Nicholls ' (2017) perspective, motivation can be described as an inner state that causes individuals to behave in a specific way to attain specific goals and purposes.

Abeysekera and Dawson (2015) In their research work, motivation was described as a psychological mechanism that provides guidance and intent to behave, a predisposition to act intentionally to meet specific unmet needs, an unsatisfied need a willingness to achieve them. The provided material is intended to help understand motivation and provide some tools and instruction to help motivate learners. Further explanation will be given to the two most common

types of motivation, extrinsic and intrinsic, along with amotivation, a word used to describe a lack of motivation.

Csikszentmihalyi and Nakamura (2014) claim that intrinsic motivation is attitude and ideas deliberately carried out with the knowledge of no external gain or award, and behaviors are also carried out solely for behavioral enjoyment. Intrinsic motivation is a fundamental cause of the life of an entity.

Extrinsic motivation identified shows the person's motive as if they were going to benefit from it in the future. Introjected refers to internalizing emotions such as guilt for failure to fulfill or satisfaction in finishing. Extrinsic motivation focuses on external gain or award (Gerhart and Fang, 2015).

Shillingford & Karlin (2013) examined the role of intrinsic motivation in the academic of non- traditional students. The researchers used 35 undergraduate students. Study findings indicate that more intrinsic motivation products were supported by participants. Therefore, in the educational activities of non-traditional students, the willingness to prove expertise, the need for a feeling of self-determination, and the enjoyment and happiness obtained from the college knowledge performed a higher part than the internal benefits such as professional progress.
In Turkey, Erten (2014) investigated the academic achievement and academic motivation of students' teachers. The study's findings showed that the respondents were extrinsically motivated in terms of identified regulation, external regulation, and the respondents were intrinsically motivated by knowledge. The respondents expressed low responses to amotivation.

A study conducted by Daguplo (2015) on the intrinsic academic motivation of education students on needs satisfaction. The finding showed that students are intrinsically motivated well to meet the satisfaction of their needs.

Throughout higher education, the current trend focuses on student-centric learning rather than teacher-centric learning. Lecturers are fundamental in deciding the student's capacity to learn in the traditional approach to education, which is teacher-centered learning (Abdullah et al., 2018). Students tend to rely on what teachers can only give. This condition leads the students to consider what they want to learn to be uncreative. One of the latest trends in learning practice is self-directed learning.

A study conducted by Abdullah et al. (2018) evaluated the influence of self-directed learning towards performance and readiness among Sudanese nursing students. A quasi-experimental research design was employed among 100 students, a case study group, and 104 control group. Results showed that there is a significant relationship between self-directed learning and readiness and performance. This signifies that increase self-directed learning would increase academic performance and readiness.

Another study conducted by Örs (2018) examined the self-directed learning readiness level among nurses. The study explored the significant difference between the department, gender, monthly income, and academic level. A total of 398 students participated in the research study. The study showed that nurses had a high level of self-directed learning readiness. However, in terms of self-management, nursing students had a low score. There was a significant difference between gender and department on self-directed learning.

In evaluating students' self-directed learning, Chou (2012) explored the relationship between self-directed learning and learning performance in an online environment. The study showed a significant relationship between self-directed learning strategies and learning performance in an online environment.

In investigating the relationship between academic motivation and self-directed learning practices, a study was conducted among 322 bachelor's students by Saeid and Eslaminejad (2016) using a simple random sampling technique. Results showed that there is a significant relationship between self-directed learning and academic motivation.

Song and Bonk (2016) explored the motivational factors for self-directed learning practices in an online environment. The study utilized a quantitative research design. The results showed that there is a significant relationship between academic motivation and self-directed learning practices. Motivational factors include choice, freedom, engagement, interest, and control.

Methodology

This quantitative study used descriptive-correlational design to examine academic motivation and self- directed learning practices among nursing students. The study was conducted at two selected universities in Baguio City. A convenient sampling technique was used to select 120 nursing students. The inclusion criteria include: a) a nursing student currently enrolled in Bachelor's in Nursing program, b) in the 3rd and 4th year, c) actively participating in asynchronous or synchronous online learning. The exclusion criteria include a) nursing students enrolled in the Associates in Nursing program, b) nursing students in the 1st year, c) nursing students not enrolled in distance learning.

Out of 120 nursing students used as respondents, 76 were female, representing 63% and 44 were males, representing 36%. In their year of study, level 3 was 67, representing 56.3%, and level 4 was 53, representing 43.5%.

The study adapted and modified Academic motivation questionnaires by Vallerand (1992), which consisted of intrinsic motivation (IM) and extrinsic motivation (EM). They will be measured using a 4-point Likert-type scale, which ranged from Strongly Disagree – 1, Disagree-2, Agree – 3, and Strongly Agree – 4. The study will also adapt and modify self- directed learning practices developed by Khiat (2015). They will be measured using a 5-point Likert-type scale ranging from Never-1, Rarely-2, Sometimes-3, Often- 4, and Always-5. The Cronbach Alpha of Studies have shown that reliability measurement based on the internal consistency as;

Table 1. *Cronbach Alpha of Studies*

Item	No of item	Cronbach Alpha
Academic Motivation	**15**	**.932**
Extrinsic Motivation	9	.926
Intrinsic Motivation	6	.862
Self-Directed learning Practices	**8**	**.851**

In determining the strength of the relationship, Cohen (1998) absolute correlation valves where r=.10 to .29, meaning small or low, r=.30 to .49 is medium or moderate and larger r=.50 to 1.0 is large or high and interpreted were used. All these Likert scales are based on Vagias (2006) Likert scale recommendation. Each table contains the scaled response and verbal interpretation, as shown below:

Table 2. *Scoring System for Academic Motivation*

Numerical scale	Numerical Likert scale average weight	Scaled Response	Verbal Intepretation
4	>3.51-4.50	Strongly Agree	High
3	>2.51-3.50	Agree	High
2	>1.51-2.50	Disagree	Low
1	>0.51-1.50	Strongly Disagree	Low

Table 3. *Scoring System for Self- Directed Learning Practice*

Numerical Scale	Scale Average Weight	Scaled Response
5	>4.51-5.50	Always
4	>3.51-4.50	Often
3	>2.51-3.50	Sometimes
2	>1.51-2.50	Rarely
1	>0.51-1.50	Never

The emails of the students were officially requested from the university registrar's offices and department of nursing. The students were emailed before distributing questionnaires with a letter stating the purpose and procedure of the study. All eligible nursing students received a copy of the questionnaires from the researchers via email.

First, the researchers sent a formal email to the Deans, department chairs of nursing, and Registrar's office to seek permission to conduct the study and access the participant's email address. Once granted, the students were emailed prior to distributing questionnaires with a letter stating the purpose and procedure of the study. The consent included the title, the study purpose and procedure, benefits, and potential risk.

The electronically signed informed consent validated that ethical considerations and legalities were ensured. The respondents were very well aware that they were not forced to join the research but were allowed to exercise their full autonomy and their right to determination. To those who refused, their decision will be respected. It was emphasized that all data gathered would be confidential and would only be shared by the researchers and held with utmost anonymity. All eligible nursing students received a copy of the questionnaires from the researchers via Email. Nursing students who were willing to participate in the study were given a questionnaire via google forms to fill out and submitted within 24-48 hours. The questionnaires filled out were stored electronically in a folder on the computer.

Ethical approval was sought from the university research center. Ethical approval is essential for all studies regardless of the field they are undertaken. The faculty of the nursing college was informed before conducting the research and the importance of the study.

In the event where human subjects are involved in research, many ethical considerations are expected to be observed. The ethical considerations observed in this study are Inform consent, voluntary participation, deception, bias and misrepresentation, confidentiality, and plagiarism. The respondents willingly participated in the study, and no one was under any compulsion and informed that they have the right to withdraw from the study if they wish to do

so.

The study used the Statistical Package for Social Sciences (SPSS) version 22 to analyze the data. Descriptive statistics such as mean and standard deviation were used for the question one and two and Pearson Correlation Coefficients were used to determine the relationship based on their strength and direction of Academic Motivation and Self- directed learning practices of nursing students. T-test was used to answer question four.

Results and Discussion

Intrinsic motivation was measured using six-item questions. The respondents scaled response of their intrinsic motivation was agree and verbally interpreted as high (*M=3.2958, SD=0.538*). In a detailed analysis, pleasure when I broaden my knowledge about subjects which appeal to me the highest scored item with agree and a verbal interpretation of high (*M= 3.49, SD=0.595*). The lowest scaled item as they find pleasure in reading interesting authors with a scaled response of agree, verbally interpreted as high (*M=3.04, SD=0.737*). This confirms Shillingford and Karlin (2013), and Daguplo (2015) study that students have a high intrinsic motivation. This implies that nursing student's intrinsic motivation which is driven by the pleasure to broaden knowledge in subjects of interest

Table 4. *Intrinsic Motivation*

	Mean	**Standard-Deviation**	**Scaled Response**	**Verbal Interpretation**
I experience pleasure and satisfaction while learning new things	3.25	.738	Agree	High
I feel satisfied when I discover new things never seen before.	3.45	.634	Agree	High
I find pleasure when I broaden my knowledge about subjects which appeal to me	3.49	.595	Agree	High
My studies allow me to continue to learn about many things that interest me	3.30	.770	Agree	High
I feel satisfied when I am in the process of accomplishing difficult academic activities	3.25	.703	Agree	High
I find pleasure in reading interesting authors	3.04	.737	Agree	High
Intrinsic Motivation	**3.2958**	**.538**	**Agree**	**High**

>3.51-4.50 Strongly Agree :>2.51-3.50 Agree:>1.51-2.50: Disagree>0.51-1.50 Strongly Disagree

Extrinsic motivation was measured using eight question items. The respondents scaled response for extrinsic motivation was agree with a verbal interpretation of high (*M=3.31, SD=0.625*). In a detailed analysis, the highest scored item was education will enable me to enter the job market in a field that I like with a scaled response of agree, verbally interpreted as high

(*M=3.46, SD=0.730*). The lowest scaled item was to show myself that I am an intelligent person with a scaled response of agree and verbally interpreted as high (M=3.03, SD=0.779). This confirms Erten (2014) study that the respondents had high extrinsic motivation. This implies that, nursing students has a high extrinsic motivation which is driven by preparation for the job market.

Table 5. *Extrinsic Motivation*

	Mean	**Standard-Deviation**	**Scaled Response**	**Verbal Interpretation**
I think that a college education will help me better prepare for the career I have chosen	3.43	.742	Agree	High
Education will enable me to enter the job market in a field that I like	3.46	.730	Agree	High
Education will help me make a better choice regarding my career orientation	3.34	.841	Agree	High
I believe that a few additional years of education will improve my competence as a worker	3.23	.871	Agree	High
To prove to myself that I am capable of completing my college degree	3.35	.765	Agree	High
To show myself that I am an intelligent person	3.03	.779	Agree	High
I want to show myself that I can succeed in my studies	3.33	.759	Agree	High
Education will help me in order to have a better salary later on	3.38	.786	Agree	High
Extrinsic Motivation	**3.31**	**.625**	**Agree**	**High**

>3.51-4.50 Strongly Agree :>2.51-3.50 Agree:>1.51-2.50: Disagree>0.51-1.50 Strongly Disagree

In analysis of the respondents overall academic motivation, the respondents scaled response was strongly agree, verbally interpreted as high (M=3.30, SD=0.5401). Both extrinsic and intrinsic motivation had a scaled response of strongly agree with a verbal interpretation of high. This is supported by Erten (2014) study that both intrinsic and extrinsic motivation was high, however, the drive is different. This implies that nursing student's academic motivation is high in terms of the pleasure to broaden knowledge in subjects of interest and preparation for the job market.

Table 6. *Academic Motivation*

	Mean	Standard Deviation	Scaled Response	Verbal Interpretation
Intrinsic Motivation	3.30	.5376	Agree	High
Extrinsic Motivation	3.31	.6246	Agree	High
Academic motivation	**3.30**	**.5401**	**Agree**	**High**

>3.51-4.50 Strongly Agree :>2.51-3.50 Agree:>1.51-2.50: Disagree>0.51-1.50 Strongly Disagree

Self-directed learning practices were quantified using eight-item questions. The respondents scaled response for self-directed learning practices was sometimes (M=3.108, SD=0.7107). In a detailed analysis, the highest scaled item was I prefer to do other things than study the learning materials or resources with a scaled response of sometimes (M=3.30, SD=1.072). The lowest scaled item was I plan what I need to learn in an online class with a scaled response of sometimes (M=2.88, SD=0.973). This confirms Örs, (2018) that their self-management is suboptimal. This implies that, nursing students self-directed learning practices still needs improvements.

Table 7. *Self-Directed Practices*

	Mean	Standard Deviation	Scaled Response
I prefer to do other things than study the learning materials or resources	3.30	1.072	Sometimes
I understand the content of the reading in my online class	3.25	.961	Sometimes
I understand what my instructor says for my online activity	3.21	.977	Sometimes
I set aside enough time to study for examination and do my assignments for an online class	3.20	1.107	Sometimes
I set my goals to achieve for assignment and examination for my online class	3.05	.926	Sometimes
I keep postponing my study tasks designed in an online course	3.05	1.101	Sometimes
I focus during an online class activity	2.93	.991	Sometimes
I plan what I need to learn in an online class	2.88	.973	Sometimes
Self- Directed Learning Practices	**3.108**	**.7107**	**Sometimes**

>4.51-5.50 Always:>3.51-4.50 Often:>2.51-3.50 Sometimes:>1.51-2.50 Rarely:>0.51-1.50 Never

In examining the relationship between academic motivation and self-directed learning practices the Pearson correlation coefficient was. The relationship between academic motivation and self-directed learning showed moderate significant positive relationship (*r=.341, p=.002*) at a 95% confidence interval. This implies that nursing student's academic motivation correlates with their self- directed learning practices. As a result, the study rejects the null hypothesis in that there is no significant relationship between academic motivation and self-directed learning

practices. This confirms Saeid and Eslaminejad (2016), Song and Bonk (2016) and Chou, (2012) study that there was a significant relationship between academic motivation and self-directed learning practices.

Table 8. *Relationship Between Academic Motivation and Self-Directed Learning Practice*

Correlations			
		Academic Motivation	**Self-Directed Learning Practices**
Academic motivation	Pearson Correlation	1	.341xx
	Sig. (1-tailed)		.002
	N	120	120

Level of significance at 0.05

An independent-samples t-test was conducted to compare the self-directed learning practices scores for females and males. There was no significant difference in scores for Males (M =3.16912, SD = .583779) and Females (M = 3.06250, SD = .794840; t (78) = -.661, p = .511, two-tailed). The magnitude of the differences in the means (mean difference = -106618, 95% CI: .214513 to-.427748) at equal variance assumed. This study fails to reject the null hypothesis that there is no significant difference in self-directed learning practices of nursing students when considering their sex. This contradicts Örs, (2018) study that there was a significant difference in terms of sex towards self-directed learning practices.

An independent-samples t-test was conducted to compare the self-directed learning practices scores for their year of study (level 3 and 4). There was no significant difference in scores for Level 3 (M =3.06944, SD =.647633) and Level 4 (M = 3.15714, SD =.791350; t (78) = -.545, p = .587, two-tailed). The magnitude of the differences in the means (mean difference = -.087698, 95% CI: -232594 to-.407991) at equal variance assumed. This study fails to reject the null hypothesis that there is no significant difference in self-directed learning practices of nursing students when considering their year of study.

Table 9. *The Difference of Self-Directed Learning Practices on Sex, and Year of study*

	Sex	**Year of Study**
T	-.661	-.545
F	1.778	2.232
Sig.	.511	.587
df	78	78
IV	NS	NS

IV = Verbal Interpretation, S= Significant, NS= Not Significant

Discussions

The study investigated the relationship between academic motivation and self-directed learning practices among nursing students in an online learning environment. The results showed that nursing students' intrinsic motivation is high in finding pleasure when to broaden knowledge

about subjects that appeal to them. Nursing student's extrinsic motivation was high in terms of being able to enter the job market. Therefore, nursing overall academic motivation is high, with both intrinsic and extrinsic motivating factors.

In terms of nursing students' self-directed learning practices, the results showed that their self-directed learning practices involve performing other activities instead of engaging in study materials. This, therefore, implies that nursing students' self-directed learning practices in an online environment are not optimal. However, there was a moderate positive significant relationship between academic motivation and self-directed learning practices. This means that nursing student's academic motivation determine with their self- directed learning practices. Secondly, despite sex or year of study, nursing students' self-directed learning are the same. The study recommends that nursing educators should employ strategies to equip nursing students with skills to improve their self-directed learning strategies in an online environment. Secondly, further researches should be done utilizing other variables with a larger population to determine the relationship towards self-directed learning.

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A Mediation Study on the Role of Coping Skills on the Relationships of Stress & Anxiety to the Quality of Sleep among Nursing Students

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Abstract

Stress and anxiety are often presumed to affect quality of sleep. Still, few studies have documented the role coping skills played on the relationships of stress and anxiety to nursing students' sleep quality. This descriptive-correlational and mediation study aimed to examine further these relationships between stress and anxiety and quality of sleep and to explore the potential mediating role of coping skills. Through purposive sampling, 132 nursing students were selected. The instrument utilized in the study was composed of adapted questions from Perceived Stress Scale, Generalized Anxiety Disorder 7-item (GAD-7) Scale, COPE Inventory, and Pittsburgh Sleep Quality Index. Data gathered were analyzed using descriptive statistics, Pearson's correlation, and analysis of variance (ANOVA). Structural equation modeling (SEM) using analysis of moment structure (AMOS) was used to analyze the mediation effect of coping skills. Findings revealed fair amount of stress, mild anxiety, good quality of sleep and good coping skills of the respondents. Furthermore, the relationships of stress and anxiety to the respondents' quality of sleep were found to be significant. Lastly, the results showed that coping skills do not mediate the relationship between stress and anxiety and quality of sleep. This study endeavors to promote a physically and mentally healthy environment for nursing students that encourages the use of positive coping skills in dealing with stress and anxiety, thus, enhancing their quality of sleep and contributing to a good quality of life.

Keywords: *academic anxiety, academic stress, coping mechanism and sleeping difficulty*

We live in a busy world where sleep is often an afterthought. Schedules are packed, and every second is valuable. The lifestyles of people today are chaotic, and the threat of inadequate sleep continues to affect our lives. There is a saying that goes, "time is money," and sleep is often "regarded as an annoying interference" (Worley, 2018), when in fact, sleep is essential for mental and physical well-being. Sleep serves many functions, such as the ability to think clearly, being alert, maintaining attention, and emotional regulation. A crucial part of adequate sleep is "physiological sequences of non-REM (rapid eye movement) and occurs when human sleep is temporally programmed by our circadian clock to occur" (Worley, 2018). If people do not get adequate sleep, they experience daytime sleepiness and experience additional symptoms such as fatigue, tiredness, and lack of energy (Shao et al., 2019).

An independent variable of our

research is how stress can affect a person's quality of sleep. A study done on students in secondary and tertiary education settings by Michaela C. Pascoe (2019) did a narrative review that presented other research about the impact of academic-related stress on young people. Results from a study in the United States showed that over 90% of 9-12th grade students reported that they do not get the adequate sleep they need on most school nights, and 42% report that stress is a contributing factor to why they have poor sleep. Too much stress can result in physical and cognitive effects. According to Yaribeygi (2017), if your concentrations of stress hormones are high, they can cause declarative memory disorders. In addition to this, it has been found that people under stress are more likely to have an impaired immune system which may place them at higher risk for illness.

Anxiety and how it correlates to the quality of sleep is another one of the independent variables our research discusses. A recent study analyzed 515 students' subjective sleep quality, anxiety, and daytime sleepiness. Results found that 28.7% of students had clinically significant anxiety, and it was also found that 50.8% of the participants with clinically significant anxiety also suffered from daytime sleepiness (Choueiry, 2016). Causes of anxiety can come from social situations where the individual fears of embarrassing or humiliating himself. Furthermore, individuals with anxiety experience poor performance and judge their quality of life lower, resulting in negative effects in other aspects of their lives.

Coping plays a big part in how people deal with anything difficult. People experience numerous challenges ranging from academic demands, interpersonal stress, and financial stress. Bettis (2017) states that coping can be organized into primary coping, secondary control coping, and disengagement coping. Primary and secondary coping can lead to beneficial outcomes to dealing with stress, but using disengagement coping can cause a greater risk of anxiety and depression.

The nursing program, specifically, is considered a challenging degree program with multiple academic and non-academic stressors leading to anxiety and poor sleep quality in nursing students. Furthermore, stress and anxiety leading to poor sleep quality may lead to substantial safety and health implications for nursing students themselves and their patients. Therefore, it is essential for nursing students to acquire appropriate sleep knowledge and understand the mechanism between stress, anxiety, coping skills, sleep quality, and well-being in general. (Zhang et al., 2018).

Stress and anxiety are often presumed to affect quality of sleep. Still, few studies have documented the role coping skills played on the relationships of stress and anxiety to nursing students' sleep quality. So, our study aimed to examine further these relationships between stress and anxiety and quality of sleep and to explore the potential mediating role of coping skills.

Objectives of the Study

The study explored the mediating role of coping skills on the relationship of stress and anxiety and the quality of sleep among nursing students in a selected university in Silang Cavite. Specifically, it sought to determine the answers to the following questions:

1. What is the level of stress of the nursing students?
2. What is the level of anxiety of the nursing students?
3. What is the quality of sleep of the nursing students?
4. What is the extent of the coping skills of the nursing students?
5. Is there a significant relationship between stress and quality of sleep?

6. Is there a significant relationship between anxiety and quality of sleep?
7. Is there a significant difference in the quality of sleep of the nursing students when nationality, age, and gender are considered?
8. Does coping skills mediate the effect of stress and anxiety on the quality of sleep?

Methodology

Research Design

This study uses a quantitative and correlational research design. A correlational research design is used to measure two variables and examine their relationship (Chiang 2015). The variables chosen to observe by the researchers are not in any way to be controlled or manipulated.

Population and Sampling Technique

This study's selected populations were the second, third, and fourth-year students of Adventist University of the Philippines who are enrolled during the 2020-2021 school year. All respondents were selected regardless of their age, gender, or nationality.

The researchers used purposive sampling to gather information because the researchers have chosen a specific population that meets the criteria of their study. The parameters of choosing only students level 2 to 4 were done to have a population that shares specific experiences (Purposive sampling: Laerd Dissertation (2012).

Instrumentation

This study uses an adapted questionnaire which is divided into five questions and is administered through Google Forms. The first part consists of questions about the respondent's demographic data. It asked the respondents about the moderating variables of this study: their age, nationality, and gender.

The second part of the questionnaire is adapted from Perceived Stress Scale, which assessed the respondent's perceived stress (Sheldon, 1983). This section consists of 10 questions that ask about the respondent's feelings and thoughts during the last month. Questions 4,5,7, and 8 are positively stated items, meaning that the scores for those respective questions were obtained by reversing their responses (e.g., 0=4, 1=3, 2=2, 3=1 & 4=0). The questions were answered using a 4-point Likert scale from 0 to 4; 4 being never, 1 being almost never, 2 sometimes, 3 being fairly often, and 4 being very often.

The third part measures the severity of anxiety symptoms of the respondents and is adapted from Generalized Anxiety Disorder 7-item (GAD-7) Scale. The GAD-7 tool is a generic, brief, self-report measure to assess generalized anxiety (Spitzer et al., 2006). This scale explores the 2-week period before the screening and is calculated by assigning scores ranging from 0 to 3; with 0 indicating “not at all;” 1 being “several days;” a score of 2 for “more than half the days,” and 3, indicating a “nearly every day” experience of the problem.

The fourth part is adapted from the COPE Inventory, which assesses the different coping strategies people use in response to a stressor (Carver, 1989). This section consists of 15

questions answered using a 4-point Likert scale from 1 to 4; 1 being I usually don't' do this at all, 2 being I usually do this a little bit, 3 being I usually do this a medium amount, and 4 being I usually do this a lot. Questions 6, 9, and 12 are negatively stated questions, meaning the respondents' response would be reversed (e.g., 1=4, 2=3, 3=2 & 4=1) when computing scores.

The fifth part of the questionnaire is adapted from The Pittsburgh Sleep Quality Index (PSQI) (Smyth, 2012). This section consists of 18 self-rated questions. The 18 items are combined to form seven component scores, each of which has a range of 0 to 3 points; 0 indicating no difficulty, and a score of 3 indicating severe difficulty. The following are the seven components with their corresponding question numbers: component 1 assesses subjective sleep quality through question number 9; component 2 is about sleep latency and is assessed through question number 2 and 5a; the third component indicates sleep duration as answered by question number 4; component 4 assesses habitual sleep efficiency through questions number 1, 3, and 4; component 5 evaluates sleep disturbances as answered by questions 5b to 5j; the sixth component is the use of sleeping medication, and is assessed through question number 6; the last component indicates the daytime dysfunction through questions number 7 and 8.

The instruments used in this study have been previously tested for their Cronbach's Alpha scores. Lee (2012), in their review of the PPS-10 psychometric properties, shows a Cronbach's alpha score of greater than .70 when evaluated through 12 studies. The GAD-7 instrument was found to have an alpha score of .91 (Tiitikainen et al., 2018). According to Measurement Instrument Database for the Social Sciences, the COPE inventory had an average alpha of .79. And the PSQI scored a correlation coefficient of 0.85 (Krishnan 2016).

Table 1. *Cronbach's Alpha of the instruments*

Cronbach's Alpha	Internal Consistency
a<0.5	Unacceptable
0.6>a>0.5	Poor
0.7>a>0.6	Questionable
0.8>a>0.7	Acceptable
0.9>a>0.8	Good
0.9>a	Excellent

Data Gathering and Ethical Considerations

Before the study was conducted, permission was requested first through a letter to the Dean of the College of Nursing and the Ethics Review Board. After the necessary edits were completed, the questionnaires were sent to students through Google forms via Facebook and messenger for data gathering. Proper instruction and guidelines for filling out the survey were explained to the students before answering the paper and as well as the purpose of the research. The participants were informed of the confidentiality of the information gathered. A consent form was given to the participants, stating that participation is not mandatory and that they have the right to withdraw. Honesty in answering the questions was also emphasized to ensure accurate results. After surveys were completed, they were collected by the researchers, and data were tallied.

This study was conducted in conformance with the principles of human research ethics.

The study was subjected to ethics review by the Ethics Review Board (ERB) of the Institution. The ethical principles were carefully reviewed to uphold the dignity of the respondents. Informed consent was utilized prior to the actual data gathering.

Data Analysis

Descriptive statistics were used to determine the respondent's demographic profile, levels of anxiety and stress, quality of sleep, and the extent of their coping skills. To determine the relationship between stress, anxiety, quality of sleep, and coping skills, the Pearson Product Moment Correlation Analysis was used. T-test and Analysis of Variance (ANOVA) were used to determine the difference in the sleep quality of the respondents considering their age, gender, and nationality. Structural equation modeling (SEM) using analysis of moment structure (AMOS) was used to analyze the mediation effect of coping skills in the relationship between the independent and dependent variables.

Results and Discussion

Stress

Table 2 shows that the respondents have fair amount of stress, as indicated by a mean score of 2.38 and a standard deviation of 0.43.

Table 2. *Stress level of the respondents*

	Mean	SD	Scaled Response	Interpretation
In the last month, how often have you been upset because of something that happened unexpectedly?	2.21	.89	Sometimes	Fair
In the last month, how often have you felt that you were unable to control the essential things in your life?	2.08	1.00	Sometimes	Fair
In the last month, how often have you felt nervous and "stressed"?	2.67	1.01	Sometimes	Fair
In the last month, how often have you felt confident about your ability to hand your personal problems?	2.65	.64	Sometimes	Fair
In the last month, how often have you felt that things were going your way?	2.54	.61	Sometimes	Fair
In the last month, how often have you found that you could not cope with all the things that you had to do?	1.93	.89	Sometimes	Fair
In the last month, how often have you been able to control irritations in your life?	2.65	.64	Sometimes	Fair

In the last month, how often have you felt that you were on top of things?	2.63	.61	Sometimes	Fair
In the last month, how often have you been angered because of things that were outside of your control?	2.21	1.03	Sometimes	Fair
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	2.20	1.01	Sometimes	Fair
Stress	**2.38**	**0.43**	**Sometimes**	**Fair**

Legend: 0.0 – 0.49 = Very Low; 0.5 – 1.49 = Low; 1.5 – 2.49 = Fair; 2.5 – 3.49 = High; 3.5 – 4.00 = Very high

A study by Rafati et al., (2018) revealed that 99.3% of nursing students were found to have moderate stress. This research agrees with our findings as nursing students can have moderate stress from having fear of unknown events, being afraid of making mistakes, and the stress in the theory and practice gap. There can also be occurrences where students' stress level is higher during the semester compared to other times, such as when they are taking or preparing for exams (Adele et al., 2017).

Stress is not always detrimental when used positively. It can help a person gain motivation to overcome and adapt to whatever their stressor comes from (Shahsavarani et al., 2015).

Anxiety

Table 3 shows the mean score for the anxiety level of the respondents is 1.10 and has a standard deviation of .70. This indicates a mild level of anxiety among the respondents.

Table 3. *Anxiety level of the respondents*

	Mean	SD	Scaled Response	Interpretation
Feeling nervous, anxious, or on edge	1.25	.84	Several days	Mild
Not being able to stop or control worrying	1.11	.88	Several days	Mild
Worrying too much about different things	1.26	.89	Several days	Mild
Trouble relaxing	1.04	.82	Several days	Mild
Being so restless that it's hard to sit still	0.81	.94	Not at all	Minimal
Becoming easily annoyed or irritable	1.23	.91	Several days	Mild
Feeling afraid as if something awful might happen	1.05	.89	Several days	Mild
Anxiety	**1.10**	**0.70**	**Several days**	**Mild**

Legend: 0.0 – 0.49 = Minimal; 0.5 – 1.49 = Mild; 1.5 – 2.49 = Moderate; 2.5 – 3.0 = Severe

Past studies such as Antonishen (2015) state that anxiety is prevalent among nursing students. The most frequent emotional reactions from nursing students were fear, anxiety, and worry. In a study by Stevens et al. (2019), anxiety levels in nursing students were evaluated, and it was found that the majority of nursing students experience mild anxiety. Many students report that anxiety is felt in stressful situations. Their reasons for feeling anxious come from completing assignments before deadlines, test anxiety, clinical duties, and interpersonal difficulties.

Coping Skills

Table 4 shows the extent of coping skills of the respondents. The mean score of 2.88 and a standard deviation of .34 indicates that the respondents often use positive coping strategies. Furthermore, this shows that the respondents have good coping skills.

Table 4. *Extent of coping skills of the respondents*

	Mean	SD	Scaled Response	Interpretation
I try to grow as a person as a result of the experience	3.01	.83	Often	Good
I turn to work or other substitute activities to take my mind off things	3.00	.91	Often	Good
I get upset and let my emotions out	2.50	1.00	Often	Good
I try to get advice from someone about what to do	2.42	.98	Sometimes	Fair
I concentrate my efforts on doing something about it	2.71	.82	Often	Good
I say to myself "this isn't real"	3.29	.85	Often	Good
I put my trust in God	3.33	.85	Often	Good
I laugh about the situation	2.7	.91	Often	Good
I admit to myself that I can't deal with it and quit trying	3.11	.86	Often	Good
I retain myself from doing anything too quickly	2.34	.69	Sometimes	Fair
I discuss my feelings with someone	2.47	.97	Sometimes	Fair
I use alcohol or drugs to make myself feel better	3.84	.51	Always	Excellent
I accept that this has happened and that it can't be changed	2.33	.98	Sometimes	Fair
I keep myself from getting distracted by other thoughts or activities	2.43	.88	Sometimes	Fair
I try to come up with a strategy about what to do	2.75	.93	Often	Good
Coping Skills	2.88	.34	Often	Good
Coping Skills	**2.88**	**.34**	**Often**	**Good**

Legend: 1.0 – 1.49 = Poor; 1.5 – 2.49 = Fair; 2.5 – 3.49 = Good; 3.50 – 4.00 = Excellent

The result supports the findings of a study done by Ekhlas (2018), where a majority of nursing students (79.7%) used coping strategies often to manage their stress. Coping mechanisms are needed when dealing with stress. Nursing students frequently experience moderate stress due to many stressors, and it is shown that they frequently used coping strategies to minimize

stress from patient care, assignments, and daily life. It was found that coping is effective in stress management and control (Ahmend & Mohammed, 2018).

Sleep Quality

Table 5 shows the quality of sleep of the respondents, with a mean of .94 and a standard deviation of .46. This implies that the respondents have good quality of sleep.

Table 5. *Quality of Sleep of the respondents*

	Mean	SD	Scaled Response	Interpretation
Subjective sleep quality	1.39	.86	Some difficulty	Good
Sleep latency	1.27	.95	Some difficulty	Good
Sleep duration	.84	1.09	Some difficulty	Good
Habitual sleep efficiency	.34	.71	No difficulty	Excellent
Sleep disturbances	1.35	.54	Some difficulty	Good
Use of sleeping medication	.20	.56	No difficulty	Excellent
Daytime dysfunction	1.17	.76	Some difficulty	Good
Sleep Quality	**.94**	**.46**	**Some difficulty**	**Good**

Legend: 0.0 – 0.49 = Excellent; 0.5 – 1.49 = Good; 1.5 – 2.49 = Fair; 2.5 – 3.0 = Poor

Yilmaz et al. (2017) also state that some nursing students have low sleep quality scores, with 56% of the nursing students in their study showing low sleep quality, with the other half 44% having normal sleep quality. The results of our study have similar results to the studies stated. Wall, (2018) study shows that the majority of nursing student participants reported poor sleep quality and acknowledged that they need more hours of sleep per night. Sleep quality is an issue to our respondents, but not to the extent as the other studies.

Relationship between stress and quality of sleep

Table 6 shows the relationship between stress and quality of sleep. The result shows a significant relationship between stress and quality of sleep (p = .000). The result further implies that as the respondents' stress gets higher by 1 level, the sleep quality diminishes by .425.

Table 6. *Relationship between stress and quality of sleep*

Correlations		
		Sleep Quality
Stress	Pearson Correlation	.425**
	p-value	.000

Yan et al. (2018) also stated that academic stress is negatively correlated with sleep quality. This is also discussed in another study by Alotaibi et al. (2020), wherein it was found that among the participants who reported poor quality of sleep, more than half also reported experiencing some level of psychological stress. The decline in sleep quality can lead to an

increase of mental stress as well.

Relationship between anxiety and quality of sleep

Table 7 shows the relationship between anxiety and quality of sleep. The result shows a significant relationship between anxiety and quality of sleep. Moreover, the result indicates that as the respondents' anxiety increases by 1 level, the sleep quality diminishes by .603.

Table 7. *Relationship between anxiety and quality of sleep*

Correlations		
		Sleep Quality
Anxiety	Pearson Correlation	.603**
	p-value	.000

Based on the correlational results, it is found that anxiety is negatively associated with quality of sleep. The same is true with the findings of the research done by Silva et al. (2020), which states that higher anxiety in a person results in worse sleep quality. Worse sleep quality can be described as shorter sleep time and late onsets of sleep. Other studies also show that students who reported anxiety experienced worse sleep quality (Blanco et al., 2020).

Differences in the Quality of sleep of the respondents when nationality, age, and gender are considered

Table 8 shows no significant difference in the quality of sleep when nationality, age, and gender, are considered.

Table 8. *Differences in the Quality of sleep of the respondents when nationality, age, and gender are considered*

Variables	*p*	Verbal Interpretation
Nationality	.079	Not Significant
Age	.821	Not Significant
Gender	.188	Not Significant

These results complement that of a study done by Matthews et al. (2015), wherein they did not find any significance when looking into the quality of sleep related to nationality, mainly due to their study only looking at a predominantly white and black school. They stated that there was no convincing data that would suggest significance due to a lack of diversity. And that could be the same reason why the results of our study were shown to be not significant. Our chosen nursing population is composed predominantly of Filipino (n=79) and Filipino-American (n=27). When it comes to age, the results of our study are in contrast with most literature, such as Gadie et al. (2017) and Schlarb et al. (2017), who discussed significant relationships between age and sleep quality in the results of their studies. Our study's different results can be due to the smaller and less diverse age range of our population.

The findings of some literature are also in contrast to the results of our study, which show

that there is no significance in sleep quality in males and females. A study by Fatima (2016) reported a higher prevalence of poor sleep quality in females when compared to males. Other studies show that women instead have better sleep quality than men but suffer from more sleep-related complaints because women go through menstrual cycles (Krishnan, 2015). This lack of significance in our results may be due to the small population size of our study.

Mediating role of coping skills on the effect of stress and anxiety on the quality of sleep

The diagram below shows the model that was developed based on the findings of the study.

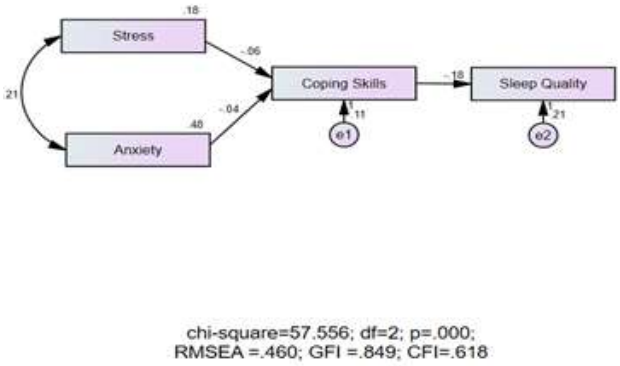

Figure 1. *Extracted model of mediation analysis using analysis of moment structure (AMOS) of the mediating role of coping skills on the effect of stress and anxiety on the quality of sleep*

The model shows stress and anxiety and their pathway to sleep quality and how coping skills are placed to indicate its role as the mediating factor of stress and anxiety to sleep quality.

Table 9 shows regression weights indicating that the path between stress and coping skills is not significant (p=.566); the path between anxiety and coping skills is not significant (p=.480), and the path between sleep and coping skills is not significant (p= .136) as well.

Table 9. *Mediating Role of Coping Skills on the Effect of Stress and Anxiety on the Quality of Sleep*

			Estimate	S.E.	C.R.	P	Label
Coping	<---	Stress	-.055	.096	-.574	.566	par_2
Coping	<---	Anxiety	-.042	.059	-.706	.480	par_3
Sleep	<---	Coping	-.175	.118	-1.491	.136	par_4

These findings imply that coping skills do not have a mediating effect on the relationship of stress and anxiety to the quality of sleep.

Similar studies have shown coping as a mediating variable and if it has any effect on stress. In a study by Horiuchi et al. (2018), it was found that when stress is divided into two mindsets: the stress-is-enhancing mindset and the stress-is-debilitating mindset, the mediating effect of coping skills was only found for the stress-debilitating mindset. One explanation for this is that people who have a stress-is-enhancing mindset see stressors more as challenges. A

study done by Graf & Kansas (2018) contradicts our findings and suggests that coping does have a mediating effect on stress and anxiety. Sadeh et al. (2014) also studied the moderating role of coping and effects of stress on sleep and found that depending on the coping style of the person, it would mediate their sleep quality.

Conclusion and Recommendation

Although this study has provided some insight into the stress, anxiety, sleep quality, and coping skills of nursing students, it is not without limitations. The contributions of this study, albeit relevant to the nursing students overall, cannot be generalized. The relatively small sample size precludes generalization beyond the study population. A follow-up study using a more nationally representative sample would improve the generalizability of the findings. Even though this online survey's response rate is moderately high, this may still cause selection bias of the nursing student population.

In addition, definitive conclusions about causal relationships cannot be drawn with the utilized design since this cross-sectional nature of this study only provides information about the variables at one point in time, whereas stress, anxiety, sleep quality, and coping skills may be varied at different time points. Future analyses of longitudinal data would be desirable to verify the study findings. It is recommended that future studies consider a longitudinal approach, examining those student characteristics and experiences throughout the years of the nursing program.

Despite literature suggesting otherwise, most participants of our research reported good results. This could possibly be due to proper distribution and management of their tasks and responsibilities. Or the reason for the said findings could be due to the limitations of this particular study. Nevertheless, Nursing is a challenging degree program with multiple academic and non-academic stressors leading to anxiety and poor sleep quality in nursing students, which could further lead to substantial safety and health implications for the nursing students themselves and patients. Therefore, it is important for nursing students to acquire appropriate sleep knowledge and understand the mechanism between stress, anxiety, coping skills, sleep quality, and well-being in general.

Findings from this study may also suggest for nursing education to consider wellness intervention programs, including self-care education about stress and anxiety management and healthy sleep practices. Coping strategies acquisition to enhance the well-being of nursing students and promote a healthier academic education is also essential and might benefit as well the future of the profession.

This study endeavors to promote a physically and mentally healthy environment for nursing students that encourages the use of positive coping skills in dealing with stress and anxiety, thus, enhancing their quality of sleep and contributing to a good quality of life and well-being.

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Level of Addiction to Gaming and Risk Depression among 15-19 year-old Gamers in Cavite, Philippines

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Abstract

Addiction to gaming is becoming a public health issue and its prevalence among adolescents is not abating but escalating. Literatures are largely unanimous when it comes to its negative effects on mental health. There are several studies related to gaming and depression done in countries of Korea, China, Hong Kong, and Singapore but there are limited data available in the Philippines. Therefore, this correlational study investigated the level of addiction to gaming and its relationship to depression among gamers in Cavite. Purposive sampling using an adopted questionnaire from the World Health Organization was employed to gather data among the 84 respondents who play video games. Of 84 gamers, 10.7% are severely addicted (M = 3.56, ± .32) and 44% are moderately addicted (M = 2.90, ± .38). Using Pearson correlation, the results revealed that gaming has a positive relationship with depression (r = .248, p-value = 0.023). Result of independent t-test showed that male gamer is more prone to addiction (t = 2.77, p-value 0.007). However, it is the female gamer who is more at risk to suffer from depression (t = -2.34, p-value = 0.024). The results of the study implied that the more time spent in gaming, the higher the risk of the gamer for depression. The risk for depression is higher among female gamers compared with male gamers. Based on the result, it is recommended that more descriptive research regarding the prevalence of gaming in Cavite should be conducted for the creation of intervention program.

Keywords: *gaming, addiction, depression*

For the past years, there had been an expansion in the quantity of time spent by youth engaging in video games due to the increasing accessibility to digital technologies. Recently, the World Health Organization (WHO) included Gaming Disorder (previously called Internet Gaming Disorder or IGD) in the International Classification of Diseases under Mental Health. WHO (2018) defined Gaming Disorder (GD) as a pattern of gaming behavior (digital or video) described by uncontrollable gaming, preference to gaming over other daily activities, and persistent gaming regardless of the problems. The inclusion was based on the reviews of the available evidences and consensus done by different organizations and geographical regions.

According to WePC (2018), there were more than 2.5 billion gamers all over the world of which 912 million were from Asia Pacific Region. The majority of gamers were men between the ages 10-35 years amounting up to 57% of the world wide gamers as reported by Filmora (2018). Literatures supported this, claiming that gaming was more prevalent among younger male individuals than the

older population (Archer & Wentz, 2017). Saunders et al. (2017) reported that the prevalence of gaming among youth in East and Southeast Asian countries was higher compare to Europe and North America. China ranked number one for having the largest number of gamers in the world amounting to 619.5 million with the majority using mobile phones for gaming (Newzoo, 2018). In the Philippines, there were 29.9 million gamers (Newzoo, 2017) of which 42% were male between the ages 10-35 years. Global and local statistics suggested that the number of gamers increases each year and was estimated to rise to 2.7 billion by 2021 (Statista, 2018).

Studies have shown that playing video games were linked to health and behavioral problems. Brunborg et al. (2014) stated that video game addiction was associated with depression and lower academic achievement. Archer (2018) agreed that the relationship between gaming and depressive symptoms was well-established as shown by a 10% increase in video game addiction increases depression by 2.5%. In a study done in 2008, it was found that depression was one of the strongest independent determinants of game addiction. Usually, a depressed individual would turn to games to escape reality thus experiencing more gaming dependency and eventually addiction and greater depression (Haagsma, 2008). The chances for depression were greater among players with the purpose to escape the reality of life (Hellstrom et al., 2015).

According to WHO (2018), depression is an illness affecting 300 million people worldwide which may possibly lead to suicide. Suicide is the second leading cause of death among ages between 15-29 years. Haagsma et al. (2012) reported that the prevalence of gaming was higher in this age group. Wei et al.'s study in 2017 showed that individuals who were dependent on video games had a higher score for depression. Kowert et al. (2012) also indicated that gaming may result in social withdrawal, physical and mental illness, and eventually to suicide. Several news have been reported online and on television regarding suicides among youth in connection to gaming (e.g., CBS NEWS, 2017; Dallas Behavioral Healthcare Hospital, 2017; UNILAD, 2017). In Korea, gaming had comorbidity to neuropsychiatric conditions and suicidal tendencies (Archer & Wentz, 2017). In 2004, Korea SBS News reported the world's first death due to gaming (Saunders et al., 2017).

Since the tentative inclusion of IGD in the Diagnostic and Statistical Manual of Mental Disorder in 2013, American Psychiatric Association (APA) has been calling for further studies related to gaming and mental health (King & Delfabbro, 2014). Early reports of gaming addiction started to appear in academic literatures back in the 1980's when videogames started to became popular (Kowert & Quandt, 2015). From then, gaming had become an accessible leisure activity with the gamers spending at least 12% of their time in it (Haagsma, 2008). Time spent in gaming increased as diverse platforms including personal computers, consoles and mobile devices such as laptops, tablets, and smartphones were easily more accessible (Kuss et al., 2016). According to Kuss (2013), the higher the internet access, the higher the prevalence of gaming which was accurate in the cases in South-East Asian countries particularly in developed countries such as Korea (Park et al., 2017). Burleigh et al. (2017) stated that as technology developed, the link between gaming and depression had developed too. This projection suggested that if technology continues to develop, the number of gamers will continue to increase, and the number of depression among gamers may also escalate.

While there were data available in China (Wu et al., 2018), Japan and Korea (Saunders et al., 2017), Hong Kong (Wang et al., 2014), and Taiwan (Wei et al., 2012), there is none or limited in the Philippine context. Therefore, the aim of this study was to investigate the level of

addiction to gaming and its relationship to depression among 15 – 29 year-old students in Cavite, Philippines. This study further investigated the difference in the level of addiction to gaming and depression between sexes. It also investigated the difference in the risk of depression between male and female who were addicted to gaming.

Methodology

Research Design

This study employed correlational research design as it attempted to measure if gaming addiction has a relationship to depression. This design measures the two variables without controlling any of them (McCombes, 2019).

Population and Sampling Techniques

The target population was Filipino student ages between 15 to 29 years. Purposive sampling method was utilized in November 2018 to target gamers only. Of the 84 respondents, 54.8% were female and 45.2% were male. Those who do not play game were not eligible to be included due to the purpose of the study.

Instrumentation

The researchers used adapted questionnaires composed of 3 main sections: (a) demographics: age, sex, and educational level (either high school or college); (b) gaming addiction scale (GAS); and (c) depression severity scale.

The gaming addiction scale was adopted from Lemmens et al. (2009). The 7-item scale assessed seven reliable characteristics of gaming addiction. The respondents were to select whether they never, rarely, sometimes, often or always experienced as per question regarding salience (or preoccupation), tolerance, mood modification (or reality-life escape), relapse (or unsuccessful attempts to reduce or stop gaming), withdrawal, conflict, and problems described in the past six months.

There were four categories for addiction: Severe, moderate, mild, and no addiction. Those who answered sometimes, often, or always on all seven items were defined as severely addicted, and those who scored sometimes, often, or always on four to six items were defined as moderate, and the rest as no addiction.

The depression severity scale was adopted from the Major Depression Inventory (MDI) developed to cover depressive symptoms in Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5). Bech et al. (2015) studied MDI and found it to be acceptable to be used for depression assessment. MDI has 10 items, 12 questions in total: question one to seven, 8a and 8b, nine, and 10a and 10b. In this study, the researchers modified question nine from a single question to 9a and 9b. Six options were included for selection according to Likert scale from “0: at no time”, “1: some of the time”, “2: slightly less than half the time”, 3: slightly more than half the time”, 4: most of the time”, and “5: all the time” as the most severe option for the depressive descriptions.

For the scoring method, the ten items (questions 1 – 10) were summed up to give a total score for depression severity. For items 8a versus 8b, 9a versus 9b, and 10a versus 10b, it was the highest score on a or b that is used. A scoring range of 31 – 50 indicated severe depression; followed by moderate depression (26 – 30), mild depression (21-25), and no or doubtful depression (0 – 20).

Analysis of Data

Statistical analysis was performed using IBM Statistical Package for Social Science 25 (IBM SPSS-25). Pearson's correlation analysis was conducted to examine the relationship of the level of gaming addiction to depression. Independent t-tests were conducted to examine if male and female have significant differences in the level of addiction to gaming and depression. Another t-test was conducted to find out if there is a significant difference in depression severity among male and female who were addicted to gaming.

Ethical Considerations

Prior to filling the survey, the research's name, purpose of the survey, and confidentiality were explained to the respondents individually. All the respondents consented to voluntarily participate in the study while remaining anonymous.

Results and Discussion

As shown in Table 1, out of 84 respondents, 9 were severely addicted to gaming (10.7%) and 37 (44%) were moderately addicted to gaming. The result suggested that one in ten gamers in Cavite has severe addiction to gaming while almost half of the gamers are moderately addicted. In term of depression, Table 2 presents that 34.5% showed no depression while 25% has severe depression. Majority of the respondents were found to be in these two groups.

Table 1. *Descriptive Analysis: Level of Gaming Addiction*

	Frequency	Percent	Cumulative Percent
No	38	45.2	45.2
Moderate	37	44.0	89.3
Severe	9	10.7	100.0
Total	84	100.0	

Table 2. *Descriptive Analysis: Depression Severity*

	Frequency	Percent	Cumulative Percent
No	29	34.5	34.5
Very Mild	16	19.0	53.6
Mild	12	14.3	67.9
Moderate	6	7.1	75.0
Severe	21	25.0	100.0
Total	84	100.0	

Relationship between Gaming Addiction and Depression

Table 3 presents the relationship between gaming addiction and depression. According to the output of Pearson's correlation analysis, the level of gaming addiction (M = 0.65 ± 0.67) has a positive correlation with depression severity (M = 1.69, ± 1.61) with a p-value of 0.023. The result suggested that high level or severe gaming addiction will relatively increase depression. It was implied that the more a person games, the more severely depressed a person will be. Though there was no strong correlation (r = .248) between gaming addiction and depression, the effect of depression experienced by the individual may be relatively severe.

According to Archer (2018), a person who was diagnosed with compulsive video game-playing and addiction showed an increased tendency of major depressive disorders. Furthermore, the symptoms of depression increased alongside with the increased time spent on gaming (Archer &Wentz, 2017). Wei et al. (2012) found that longer gaming hours was one of the predictors for depression in Taiwan. The results were consistent with the concept that symptoms of addiction and depression were positively influenced by each other (Liu et al., 2017).

Table 3. *Relationship between Gaming Addiction and Depression*

	(N = 84)	r	p value
Gaming Addiction	0.65 ± 0.67		
Depression	1.69 ± 1.61		
		0.248	0.023*

**: p < 0.05*

Gaming Addiction and Depression between Male and Female

Table 4 shows the significant differences between male and female when it comes to gaming addiction and depression. Independent t-test analysis was conducted to measure the difference in gaming addiction between male and female. According to the result of the analysis, male has a mean of 0.87 (± 0.623) in the level of gaming addiction while female has a mean of 0.48 (± 0.658). The p-value 0.007 signified that the difference between male and female is significant. In depression, male has a mean of 1.32 (± 1.526) and female has a mean of 2.00 (± 1.619). Using independent t-test, this difference was not significant (t = -1.978, p = 0.051).

According to the results of this study, male gamers had a significantly higher tendency of gaming addiction than female. Female generally shows higher depression than male but the

t¬-test result is not significant. Griffiths and Hunt (1998) found that male has a significant higher gaming behaviors than female (Desai et al., 2010) starting at an earlier age. Although most of the studies confirmed this already (Wang et al., 2014; Yarasini et al., 2018), there was a trend emerging among gaming population where female had increasing vulnerability to depressive behaviors (Wu et al., 2018). High levels of gaming addiction were usually found among male; however Kuss and Griffiths (2012) stated that female gender was also a predictor of gaming addiction.

Table 4. *Independent t-test between sex and gaming addiction and depression*

	Male (N = 38)	Female (N = 46)	t value	p value
Gaming addiction	0.87 ± 0.623	0.48 ± 0.658	2.771	0.007**
Depression	1.32 ± 1.526	2.00 ± 1.619	-1.978	.051

***: p < 0.001*

Depression Severity between Male and Female Gaming Addicts

Table 5 shows the result of another t- test that was conducted to investigate whether there is a significant difference in depression severity between 28 males and 18 females who were either moderately or severely addicted to gaming. The t-test result showed that the difference in depression severity between male and female gaming addicts is significant (t = -2.340, p = 0.024). Female who were addicted to gaming (2.61 ± 1.335) have higher depression severity than male who were also addicted to gaming (1.57 ± 1.55). Based on this result, there is a significant difference in depression severity between male and female who were addicted to gaming.

Table 5. *Independent t-test between sex and depression among the gaming addicts*

	Male (N = 28)	Female(N = 18)	t-value	p-value
Depression	1.57 ± 1.55	2.61 ± 1.335	-2.340	.024*

***: p < 0.005*

Given that the number of male and female respondents in the study was not equal, these results implied that although addiction to gaming was more likely to be seen in male, female who were addicted to gaming tended to be more depressed. Wei et al. (2012) found that even though gaming addiction is fewer among female, female gamer was a predictor of depression, using games as a way of dealing with depression. Moreover, depressive symptoms increased with longer weekly gaming hours among female gamers (Wei et al., 2012). There are other contributing factors that lead to depression than gaming. However, female who were addicted to gaming showed a higher depression severity than male who were addicted to gaming according to the result yielded from t-test. This result of analysis agreed with the previous study that while there were more male gamers and more male prone to gaming addictions, the severity of depression was significantly higher among female gamers (Ahmadi, 2014; Wei et al., 2012).

The results of the study supported what has been previously established regarding the relationship between gaming addiction and depression- the more dependency to gaming, the higher the risk for depression. The result suggested that one in ten gamers in Cavite has severe

addiction to gaming while half of the gamers are moderately addicted. Male gamers were more at risk to be addicted to gaming compare to female gamers but female gamers who were addicted to gaming may have a harder time to deal with depression. The results agreed with all the studies previously conducted and supported WHO in the inclusion of GD as a mental health disease that needs immediate health interventions. Therefore, after the results of the study were reviewed and analyzed, it is recommended that more descriptive research with more moderators should be done regarding the prevalence of gaming in the Philippines. Moreover, it is suggested to find the underlying causes of gaming and to create an intervention program against gaming dependency. It is further recommended that more research be done on female gamers' higher tendency to experience gaming-related depression.

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Journal of Health Sciences | ISSN 2599-5456

Prevalence of Sedentary Lifestyle Among Middle Class Employees: Basis for a Physical Activity Program During the Pandemic

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Abstract

COVID-19 pandemic has brought many challenges to employees. As the world experienced lockdown, employees have no choice but to work from home. With this new method of working, employees maybe of greater risk for a sedentary lifestyle. This study determined the prevalence of sedentary lifestyle among middle class employees as a basis for a physical activity program during this pandemic. The study was founded upon the trans-theoretical model which posits that individual's behavior can be changed depending upon the stages of change where he/she is at. The study utilized descriptive design using survey questionnaire as a tool. Purposive sampling was employed in choosing respondents who are professional employees working from home this pandemic time. Only 29 of the 60 distributed questionnaires were retrieved. Among the 29 respondents, 17 (58.6%) were females and 12 (41.4%) were males. Their ages were between 24-43 years old with 21 out of the 29 (72.4%) having earnings of between Php20,000-Php60,000 per month. Out of 29, 19 (65.5%) of them believe that physical activity is only for overweight and obese. Additionally, 23 (79.3%) spend most of their time sitting while working. As a result of this study, a module entitled "Kick the Pandemic: Promoting Physical Activity among Employees Working from Home" was created and conducted. "Kick the Pandemic" is a lifestyle medicine program designed to address the knowledge, attitudes, and practices of the participants to make them adopt a more physically active lifestyle. This study was conducted in the context that employees were working from home with minimal means of physical activity (PA). Further research is recommended to assess sedentary lifestyles after the pandemic where employees have better means for PA.

Keywords: *sedentary lifestyle, employees, working from home, physical activity*

Physical inactivity (PI) has been considered a pandemic (Kohl et al., 2012). The Center for Disease Control and Prevention (CDC, 2019) stated that PI is one of the four main risk factors for preventable chronic diseases. A recent study from Guthold and others (2018) showed the global age-standardized prevalence of PI was 28% in 2016, 23% in men and 31% in women. Age standardized estimates of PI among adults 18+ years old in the Philippines showed that 40% of adults do not get sufficient PA, i.e., 30% in men and 49% in women (World Health Organization [WHO], 2016). According to the Australian Department of Health (2019), physical inactivity means not meeting the recommended amount of physical activity (PA) which is 150 minutes of moderate-

intensity or 75 minutes of vigorous-intensity PA throughout the week while sedentary behavior (SB) means sitting or lying down for long periods of time. Sedentary behaviors typically have an energy-expenditure range of 1.0-1.5 METs (metabolic equivalents of task) (Tremblay et al., 2017). Sedentary behavior can lead to obesity, cardiovascular disease, overall mortality, diabetes, mental health complications, and muscle and bone degeneration (Gums, 2021). According to Pecanha et al. (2020), home isolations and reduced social interactions, although effective for Covid-19 infection control, is likely to result in a decrease in PA levels and increase in SB. Hall et al. (2020) concluded that PI will troublingly continue to worsen as a result of the Covid-19 pandemic, as many opportunities for PA have been suspended. McDowell et al. (2020) on the other hand, found that between February and May 2020 over 30% of the US labor force transitioned to work from home (WFH). Similarly, they also say that there are reports of large changes in unemployment and working environments in Europe and South-East Asia. With most of the companies in the Philippines adopting a WFH setup, employees maybe of greater risk for sedentary lifestyle.

This study determined the prevalence of sedentary lifestyle among middle class employees as a basis for a physical activity program during this pandemic. It specifically answers the following questions: (a) What are the demographic characteristics of the respondents? (b) What is the level of knowledge, attitude, and practice of the respondents in terms of sedentary lifestyle? (c) Is there a significant difference in the knowledge, attitudes, and practices when demographics are considered?

This study was founded upon the trans-theoretical model (TTM) which posits that individual's behavior can be changed depending upon the stages of change where he/she is at (Prochaska & DiClemente,1983). Individuals move through six stages of change: precontemplation (unaware that their behavior is problematic) , contemplation (recognize that their behavior may be problematic) , preparation (taking small steps toward the behavior change), action (recently changed their behavior and intend to keep moving forward with that behavior change), and maintenance (have sustained their behavior change for a while and intend to maintain the behavior change going forward); for each stage of change, different interventions strategies are effective at moving the person to the next stage of change (LaMorte, 2019). Han et al. (2017) cited that TTM has been effectively applied for PA behaviors.

Methodology

Research Design

This study utilized an analytical cross-sectional design (Alexander et al., 2015). The design was deemed fit for the study because it characterized the prevalence of a health outcome in a specified population at one point in time (sedentary lifestyle) as well as its relationship to an exposure (age, education, occupation, and income).

Population and Sampling Techniques

This study was conducted among bank employees from Eastwest Bank Head Office in Taguig, Metro Manila and working professionals from the Johannine Disciples Circle in San Pedro, Laguna aged 24-43 years old as of November 2020. Purposive sampling was employed in

choosing respondents who are professional employees working from home this pandemic time. A total of 60 employees were given survey questionnaires, however, only 29 were retrieved. Therefore, the 29 were considered the respondents for the study.

Instrumentation

A validated self-administered online survey questionnaire was used for data collection. It consisted of 17 items with four sections. The first section collected demographic data (age, gender, education, occupation, and income). Subsequent sections explored knowledge, attitudes, and practices towards PA. The knowledge section had six statements answerable by True or False, the attitude section had six statements answerable by Agree or Disagree, and the practice section had five statements answerable by Yes or No.

Analysis of Data

IBM Statistical Package for Social Sciences (SPSS) v. 23.0 was used for data analysis. Descriptive statistics was used to illustrate the respondents' demographic characteristics, categorical variables are measured in percentages while continuous variables were expressed as mean ± standard deviation. Inferential statistics (Kruskal-Wallis H and Mann-Whitney U test) was used to assess the association of the respondents' demographic characteristics with their Knowledge, Attitude, and Practice (KAP) mean scores. P value of < 0.05 taken as significant.

Ethical Considerations

This study was performed with permission from the pastoral head of the Johannine Disciples Circle and officer-in-charge of the Treasury Operations Department of Eastwest Bank Head Office. A written consent was taken from the respondents, and they were informed of the purpose of the survey prior to initiation. All respondents participated voluntarily in the survey

Results and Discussion

A total of 60 questionnaires were distributed and 29 came back with a response rate of 45.3%. Mean age of the respondents was 30.86 ± 4.77 years as shown in Table 1. Among the 29 respondents, 17 (58.6%) were females and 12 (41.4%) were males. There were three (10.3%) undergraduates, 23 (79.3%) college graduates, and three (10.3%) with a postgraduate degree. Among the 29, 14 (48.3%) were office workers, 15 (51.7%) were not. Only one (3.4%) has earnings lower than 9,000 pesos, 4 (13.8%) had earnings between 9,000-20,000 pesos, 9 (31%) between 20,000-40,000, 12 (41.4%) between 40,000-60,000 pesos, and 3 (10.3) with earnings above 60,000 pesos.

Table 1. *Demographic Profile of the Respondents*

Age (30.86 ± 4.77)	**N (29)**	**%**
24-28	9	31
29-33	13	37.9
34-38	3	13.8
39-43	4	17.2
Gender		
Male	12	41.4
Female	17	58.6
Education		
College Undergraduate	3	10.3
College Graduate	23	79.3
Postgraduate	3	10.3
Occupation		
Office Worker	14	48.3
Non-Office Worker	15	51.7
Income		
<9000 per month	1	3.4
Between 9000-20,000 per month	4	13.8
Between 20,000-40,000 per month	9	31
Between 40,000-60,000 per month	12	41.4
Between 60,000 or more per month	3	10.3

Table 2 describes the respondents' knowledge of Physical Activity (PA). Knowledge was assessed with six statements answered by True or False. A score of one was given to a correct answer and zero to a wrong answer. A score > 4 was considered adequate knowledge while a score ≤ 4 was considered poor knowledge.

Table 2. *Knowledge Assessment*

	TRUE (%)	FALSE (%)
Physical activity is a planned, structured, repetitive and intentional movement for the purpose of improving any part of the body.	20 (69)	9 (31)
Physical activity helps strengthen your immune system against infectious diseases like Covid-19.	29 (100)	0
Physical activity helps prevent stress.	29 (100)	0
Household chores can be considered as physical activity.	28 (96.6)	1 (3.4)
Globally 1 out of 4 adults is not active enough.	26 (89.7)	3 (10.3)
The World Health Organization (WHO) recommends at least 150 minutes of moderate intensity physical activity throughout the week.	29 (100)	0
		(Overall mean 5.17 ± 0.71)

Out of 29 respondents, 3 (10.3%) showed poor knowledge of PA while 26 (89.7%) showed adequate knowledge of PA. Moreover, 20 respondents (69%) got the definition of PA wrong. Majority showed adequate knowledge of PA with a mean knowledge score of 5.17 ± 0.71.

Attitude towards PA was assessed with six statements answered with Agree or Disagree as shown in Table 3. Each statement was labeled with positive attitude or negative attitude. A score of one was given to positive and zero to negative attitudes. A score > 4 was classified as positive attitude and ≤ 4 negative attitude.

Table 3. *Attitude Assessment*

	Agree (%)	Disagree (%)
Physical activity takes too much time.	5 (17.2)	24 (82.8)
Physical activity improves my stamina so I can do more within the day.	29 (100)	0
Physical activity is only for those who are overweight/obese.	19 (65.5)	10 (34.5)
Physical activity is only for those who are interested in sports/ body building.	15 (51.7)	14 (48.3)
Physical activity is for adolescents; at my age physical activity does not improve my health.	1 (3.4)	28 (96.6)
Being physically active is expensive. (Paying for gym/shoes/ clothes/etc.)	6 (20.7)	23 (79.3)
		(Overall mean 4.72 ± 0.92)

Majority of the respondents (n = 24; 82.8%) believed that PA does not take too much time and 29 (100%) maintained that it improves stamina. Out of 29 respondents, 19 (65.5%) were of opinion that PA is only for those who are overweight/obese. In addition, 15 (51.7%) said that PA is only for those who are interested in sports/bodybuilding while 14 (48.3%) said otherwise. All but one (96.6%) disagreed that PA does not improve health at their age and 23 (79.3%) hold that being physically active is not expensive. Overall, attitude towards PA was positive with mean

score of 4.72 ± 0.92.

Table 4. *Practice Assessment*

	Yes (%)	No (%)
I spend most of the time at work sitting	23(79.3)	6(20.7)
I spend most of the time at work standing or walking	6(20.7)	23(79.3)
I do physical exercise such as swimming, jogging, aerobics, football, tennis, gym workout etc. 1-3 hours per week	18(62)	11(37.9)
I walk 1-3 hours per week, including walking to work, shopping, for pleasure etc.	22(75.9)	7(24.1)
I do housework/childcare 1-3 hours per week	13(44.8)	16(55.2)
	(Overall mean 4.72 ± 0.92)	

Practice towards PA were assessed with five statements answered by Yes or No as shown in Table 4. Each statement was labeled with good or poor practice. A score of one was given to good while zero to poor practice. A score ≥ 3 was classified as good practice and < 3 poor practice. Majority of the respondents 23 (79.3%) spent their time at work sitting while only few 6 (20.7%) spent their time at work standing or walking. A good number of respondents do exercise 18 (62%) while 22 (75.9%) walk often. In addition, less than half of the respondents 13 (44.8%) do housework or childcare. Mean practice score was at 2.24 ± 0.83 revealing poor PA practice among the respondents.

Association of demographic characteristics and mean KAP scores are shown in Table 5. There was no significant association between demographic variables and mean KAP scores ($p < 0.05$).

Table 5. *Association of Demographic Characteristics and Mean KAP Scores*

Age Group	N	Knowledge Score (Mean ± SD)	p-value	Attitude Score (Mean ± SD)	p-value	Practice Score (Mean ± SD)	p-value
24-28	9	4.78 (0.67)	0.162	4.56 (1.01)	0.744	1.78 (0.83)	0.117
29-33	13	5.38 (0.65)		4.69 (1.03)		2.31 (0.86)	
34-38	3	5 (1)		5 (0)		3 (0)	
39-43	4	5.5 (0.58)		5 (0.81)		2.5 (0.58)	
Education							
Undergraduate	3	5.33 (0.58)	0.338	4.67 (0.58)	0.422	1.33 (0.58)	0.139
College Graduate	23	5.09 (0.73)		4.65 (0.94)		2.35 (0.83)	
Postgraduate	3	5.67 (0.58)		5.33 (1.16)		2.33 (0.58)	
Occupation							
Office Worker	14	5.07 (0.48)	0.27	4.93 (0.83)	0.331	2.29 (0.83)	0.813
Non-office worker	15	5.27 (0.88)		4.53 (0.99)		2.20 (0.86)	
Monthly Income							
<9000 per month	1	5	0.327	2	0.056	2	0.648
Between 9000-20,000 per month	4	5		4.25 (0.98)		2 (1.16)	
Between 20,000-40,000 per month	9	5.22 (0.44)		5 (0.71)		2 (0.87)	
Between 40,000-60,000 per month	12	5.33 (0.99)		5.08 (0.52)		2.5 (0.80)	

Between 60,000 or more per month	3	4.67 (0.58)	4 (1)	2.33 (0.58)
Total	**29**	**5.17 (0.71)**	**4.72 (0.92)**	**2.24 (0.83)**

**Krukal Wallis Test, **Mann Whitney Test, p 0.05.*

The study sought to evaluate the prevalence of sedentary lifestyle among middle class employees working from home during the pandemic. Results reveal that respondents have adequate knowledge of PA as the mean knowledge score was 5.17 ± 0.71. However, 20 (69%) have gotten the definition of PA wrong. By definition, PA is any movement a person does while exercise is planned, structured, repetitive, and intentional movements intended for physical fitness (Gummelt, 2015). Simoneaux (2020) says that most people will commonly mistake PA for exercise. She says that all PA contributes to overall health, and that exercise assists with the improvement of physical fitness; a combination of both brings the greatest impact on health.

Attitude towards PA was positive as mean attitude score was 4.72 ± 0.92. Results indicate that majority of the respondents were aware of the benefits of PA in increasing stamina and improving overall health. Most respondents were not affected by time (24 respondents) and cost (23 respondents) which Justine and others (2013) found as some of the barriers to PA. In addition, 19 (65.5%) of the respondents said that PA is only for obese/overweight. This is similar to a recent study that showed 38% (n = 120) of middle aged-elderly individuals believed that they are "already active enough" and would not need PA (Justine et al., 2013). Among 29 respondents, 15 (51.7%) hold that PA is only for those who are interested in sports/body building. A study by Kopczynski and others (2014) mentioned that obese individuals showed less positive attitudes towards exercise compared to those in healthy-weight range. They say that exercise offers lower incentives for obese than healthy-weight individuals.

Practice of PA was poor with mean score at 2.24 ± 0.83. Most of the respondents 22 (75.9%) walk and 18 (62%) exercise regularly. However, 23 (79.3%) spent most of their time sitting at work. According to the Australian Department of Health (2019), a person can be physically active and meet PA guidelines but can still be considered sedentary if they spend a large amount of their time sitting or lying down. A recent study by Whitefield and others (2017) found that recreational distance runners are simultaneously highly sedentary and highly active, suggesting independence of sedentary behaviors and moderate-to-vigorous intensity PA. It is suggested that researchers and practitioners should consider PA promotion and SB reduction as two independent intervention goals instead of conflicting behaviors (Han et al., 2017).
Using the results as basis and the application of TTM, it is safe to say that majority of the respondents are at the action and maintenance stages in terms of PA. It is recommended to develop an intervention that would help in maintaining PA habits over time as well as preparing for future setbacks while increasing enjoyment of PA. However, respondents may be in pre-contemplation stages in terms of SB. Most, if not all, of the respondents may be unaware of the effects of prolonged sitting time and its independence to meeting PA guidelines. It is recommended to develop an intervention to raise awareness on the harmful effects of prolonged sitting time and develop strategies in overcoming it. Within this context, a module entitled "Kick the Pandemic: Promoting Physical Activity and Reducing Sedentary Behaviors among Employees Working from Home" was created and conducted. It is a lifestyle medicine program designed to help an individual progress through different stages of readiness to PA and SB. Further research is recommended to assess sedentary lifestyles after the pandemic where employees have better means for PA and less sitting time.

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In the Face of COVID-19: A Phenomenological Study on Pandemic Survivors

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Abstract

The aim of this phenomenological study was to investigate the lived experiences of COVID-19 survivors. Informants were chosen using criterion sampling based on predetermined inclusion and exclusion criteria. The researchers utilized an interview guide to help the informants articulate their lived experiences, challenges, coping strategies, and observed changes in their daily lives. Data collected were then transcribed, analyzed, interpreted, discussed, and broken down into themes. The identified themes described their lived experience as Challenging, Horrifying, and Eye-Opening. Themes that arose from the experience of learning they were laboratory confirmed COVID-19 patients were Fear, Denial, Acceptance, and Total Dependence on the Lord. Themes that depicted Struggles with Healthcare Accessibility were Easy Access, Lack of Nurses, and Embarrassment to Always Ask for Assistance, Not being allowed to see Loved Ones and Hospitals that cannot admit COVID-19 Patients. Identified themes based on description of coping mechanisms were Support from different People, Faith in God, and Mental Preparedness. Using the Biopsychosocial and Spiritual Approach, the following themes that described the changes of their daily living were identified- Be healthy, Be Knowledgeable, Be Cooperative, Be Calm, Value time with loved ones, and Have a Support group. The aforementioned emerging themes can be serve as baseline data in planning interventions and improving current and future COVID-19 response and management.

Keywords: *COVID-19 survivors, lived experiences, mental health, phenomenology public health response*

Coronavirus disease (COVID-19) is a newly discovered coronavirus strain that causes an infectious disease mainly by saliva droplets or nasal discharge. The first case was discovered in Wuhan, China on December 31, 2019 and on January 30, 2020, the outbreak was then declared a Public Health Emergency of international concern. As of April 1, 2021, there have been 125 million confirmed cases, including 2.81 million deaths worldwide (World Health Organization, 2020). This pandemic has been the biggest threat the world faced since WWII. Since its discovery late last year in Asia, the virus has spread to all continents except Antarctica. Cases are increasing on a regular basis all over the world. In the Philippines, the current confirmed cases are 747,288 with a recovery percentage of

80.86% as of April 1, 2021 (WHO, 2020).

The World Health Organization reports that during the COVID-19 pandemic, psychological problems must be considered for the general public. Many scholars have also emphasized the importance of providing psychological first aid to patients admitted to COVID facilities (Li et al., 2020; Xiang et al., 2020). Routine mental health professional assessment is said to be useful as part of the care protocol, but it is currently not discussed or registered for holistic management of stigmatized, aggrieved coronavirus disease-19 fighters and survivors. Furthermore, psychiatrists and mental health practitioners should also be prepared to deal with the mental health ramifications of the post-COVID period (Das, 2020).

Qualitative research creates an excellent avenue in investigating the lived experiences of these patients. This form of study is best for "investigating subjective meanings within a society, recognizing attitudes and values, and unraveling the complex constructs of culture and social traditions," according to Hartley and Muhit (2003). In such circumstances, a range of social, mental and physical problems can be anticipated but have yet to be formally evaluated. It is therefore essential to conduct a qualitative study of COVID-19 survivors to identify their lived experiences, struggles in seeking healthcare assistance, coping strategies and the impact of their diagnosis to their overall well-being post-infection. It is believed that this study forms a basis to plan intervention as necessary. Hence, this study aims to determine and interpret the lived experiences of COVID-19 survivors in the Philippines.

Methodology

To accomplish the objectives suggested in this study, the phenomenological theory approach was used. Phenomenology is described as the scientific analysis of phenomena based on a detailed account of the informants' experiences as they occurred.

Criterion sampling was employed to select information-rich cases from a population of COVID-19 survivors using carefully determined inclusion and exclusion criteria. There are a total of six (6) inclusion criteria which aim to select a sample population. The inclusion criteria that were established are: (a) Filipino citizenship; (b) 20-80 age range; (c) confinement due to COVID-19 belonging to either severe or critical COVID-19 case classification based on the Department of Health COVID-19 guidelines, with at least one [1] positive RT-PCR test; (d) intubated or was administered with continuous positive airway pressure (CPAP) regardless of length of time of administrations; (e) was confined in a secondary or tertiary hospital in the Philippines in a COVID-19 designated room or unit; and (f) was able to recover and was subsequently discharged with at least one [1] negative RT-PCR test for COVID-19 after treatment and was able to complete a 14-day home quarantine after hospital discharge to ensure full recovery. To mitigate inaccurate recall of information and any deviating thought, an exclusion criterion was set, which states that the sample population should have no medical history of mental disability and substance-related disorder.

A list of prospective primary informants was generated with the aim of collecting information on the perspectives, challenges, and coping mechanisms of COVID-19 survivors, as well as the effect of the disease in their lives. Identification of these informants was facilitated by monitoring social media posts of COVID-19 survivors or their families, as well as testimonies of COVID-19 survivors reported in the Department of Health's official website (DOH). Emails were sent to persons of interest, seeking their permission to participate in the study. Those who agreed

to participate were then asked for their preferred schedule for the first online meeting, which was held through Zoom. All collected data were stored in a flash drive which is under the custody of the Data Manager. Other data from laptops, mobile devices and any other device used to record the interview were deleted. The flash drive will be kept for three (3) years after publication of results. When applicable, data stored in the cloud storage will be deleted. Thereafter, said drive will be destroyed by incineration.

Qualitative research data analysis attempts to explain and analyze the essence of an experience, typically by defining key subordinate and main themes (Moser and Korstjens, 2017). The researchers carefully transcribed the recordings of the interview then determined the existing common themes through the use of NVIVO analysis software. Keywords from participants or documents were looked up in the results. The node function was then used to code the key words. The question was then used to find the keywords. From the results, NVivo then provided a thematic classification of data based on the generated keywords.

The study sought and was granted approval by the AUP-Ethics Review Board (ERB with the approval number 2020-ERB-AUP-062). With this, researchers ensured that Informed Consent and Voluntary Participation, Principle of Non-Maleficence, Confidentiality and Anonymity and Assessment of Relevant Components only were observed in the conduct of the study.

Results and Discussion

A total of five (5) informants participated in this study which aims to investigate the COVID-19 survivors' lived experiences. It is believed that this study forms a basis to plan medical intervention in a biopsychosocial approach as necessary. This study generated the following findings:

Table 1. *Themes Generated from the Experiences of COVID-19 Survivors*

Theme	Subthemes
1. Challenging	Alone
	Seen as threat to others
2. Horrifying	Intubated
	Complicated Grief
3. Eye-Opening Experience	Soul-Changing
	Positive Outlool in Life
	Grateful

Although numerous studies on COVID-19's biological and epidemiological outcomes of have been conducted, there have been a few studies done on COVID-19 survivors' experiences (Olufadewa et. al, 2020), especially on the critical cases. When asked about how they would describe their experience as COVID-19 survivors, the following themes emerged: (a) challenging (b) horrifying experience; and (c) eye-opening experience.

Challenging. Family and social support are crucial to helping infectious disease patients (Huang et al., 2018). This is why the separation from the patient's families, social disturbance, and changes in life have challenged some patients. Change in social dynamics significantly emerged in the themes, and was one of the core elements of their narrative accounts.

Informant 5 stated:

"It's difficult as a COVID patient that your alone in your room since you can only rely on yourself and the nurses……. and as much as possible I lessen the exposure of our nurses. So when I need something I do it by myself most of the time, even at the ICU I'm alone so it was really difficult for me as a patient. Also why it is difficult is because I haven't seen my family…..I'm worried so I know they are also worried."

Loneliness is a common feeling that all people go through. Since it is a distinctly subjective experience, it is caused by the individual's personality, environmental and social shifts, and history. The history involves the illnesses and the sociocultural context in which those illnesses may have risen (Rokach, 1996). Although social isolation helps to keep COVID-19 from spreading, it also has the potential to damage the cardiovascular and immune systems which are part of the major systems that is targeted by COVID-19 (D'Acquisto & Hamilton, 2020). To achieve the optimum advantage of healthcare delivery, clear-cut protocols of hospital visitation and social distancing must be established.

Informant 5 also added another challenging side of being a COVID patient stating:

"It's challenging in a way…... Also why it is difficult is because I haven't seen my family, they cannot take care of me. I'm worried so I know they are also worried."

Informant 1 also added:

"My major worry is. 'Were my family members infected? Were my family members infected?' I didn't know that, and, my worry on that was kind of challenging for me on my health...When I finally got a note from my family to say that 'don't worry, no one is infected, everyone is at home', the peace of mind was very very important. When I found that out, without even giving me drugs, while I was even in ER, while I was not even in ICU, I started to get well."

The informants realized that they were perceived as threat to the health of their immediate family and would have to assume responsibility if they succumb to COVID-19 as well. These shifts have far-reaching effects not just in terms of how we communicate with our significant others, but also in terms of weakening our sense of safety and our ability to "be there" for our loved ones (Schimmenti, 2020).

Lastly, another challenging part of their experience was the lack of information of the disease.

Informant 5 stated:

"I'm worried so I know they (family members) are also worried. Also since this disease is new, we have less information about it."

Informant 3 also expounded on this issue stating:

"There's absolutely a lack of information and I'm a patient who wants to know what's happening and that is the failure of the gap – the communication gap. And I think at that early stage, even the medical caregivers were in a gizzy what this crazy thing is about… And I think that it should be handled because you can't act properly if you don't know the whole data about the disease, about what you're going through.."

In the early stages of an outbreak, a lack of sufficient awareness is likely to be the driving force behind public hysteria, emphasizing the importance of information. Misunderstandings about available information, or even exaggerating such information, can exacerbate panic. Regrettably, this is a fairly common occurrence. To calm the public, timely release of reliable research results in a format that is understandable to the general public will be an effective strategy (Wang et. al., 2020).

Horrifying. Informants further described their experience as horrifying especially that the mechanical ventilator served as their only lifeline. They also detailed the uncomfortable experiences that came with its use.

Informant 2 stated:

"I was on ventilator for 19 days. And being on ventilator and even after that you are gasping for air every minute or every second.....to be on ventilator for 19 days uh that was beyond ordinary. 85% of my lungs was covered with COVID pneumonia...It's like you need air every time so...para kang naglaro ng basketball na naubusan ng hangin (It's like playing Basketball and you ran out of air), and then you want to have air every time. So, all your waking hours that's all that you needed. You just needed air and then you keep on trying to breath and breath and breath and parang sasabog na ang dib dib mo (and your chest seems to explode). So, it's really a very difficult ordeal."

Informant 1 added:

"I am also fighting illusions, so I'm hearing voices, and I'm fighting, I'm trying to think if what I'm hearing is true or not….I'm overhearing a nurse saying that my wife died, and my second child died. You just don't know how distressful that was for me, I thought to myself, hold on, am I hallucinating or not? Am I hallucinating?' I have to really write down, because I couldn't talk, I have to write down to the nurse, 'please ask my family', I ask the nurses many times, please ask them how are they."

Informant 3 further added:

"I wanted them to take away the damn tube because when I was in the hospital I was insisting to get the damn tube out of my mouth. It was so uncomfortable, I thought I would die with the tube in my mouth – and if I wasn't insisting, I don't think they would have taken the tube out of my mouth because I kept on telling them."

During the stay in the ICU, intubated patients face a number of physical and psychosocial issues, including sensory overload or the lack thereof, physical pain, body numbness, dizziness, physical limitations, restlessness, unanticipated tracheal tube removal, fear, anxiety, frustration, guilt, sleep disturbances, and confinement in an unfamiliar setting (Pakmeh et. Al., 2017).
The ventilator, along with its accessory equipment, restricts the patient's movements. Due to these restrictions, patients felt much more reliant on others, especially nurses, to perform/meet their daily activities/requirements. With this increasing feeling of dependence, these patients experienced feelings of hopelessness and low self-worth. Dependence on a ventilator, according to Belitz (1983:43), continuously threatens patients with the fragility of their physical state, as well as the risk of irreversible injury or death, endangering their self-image and sense of worth (Jordan et al., 2002).

Notably, this theme included complicated grief that arose from the loss of a loved one and failing to see them for the last time.

Informant 3 stated:

"I have never experienced such indescribable pain because I wasn't able to talk to him (husband), I wasn't able to reassure him of my love forever. I feel that he wouldn't have passed away if there was somebody whispering to him or talking to him and giving him confidence."

"The doctors may not think it, but it's mental health and it's a question of spirit, you know? Strength, determination – that should be factored in. I'm not afraid to say I said it, and they should do something about it."

Because of the pandemic, grief experiences have been interrupted, and new approaches to grief care are needed. Understanding the dynamics of this grief, as well as having access to and exchanging tools for better communication, telehealth, and self-care, is critical to helping patients, families, friends, and groups of the population (Wallace et. Al., 2020).

Eye Opening Experience. For some patients, being diagnosed with COVID-19 was an eye-opening experience. Patients reported how they cherished life in the face of COVID-19.

Informant 1 stated:

"So, I think overall the word for me is soul- changing… it's more of reflecting and discerning after, because my whole attitude and whole outlook was changed. I am looking at life with a new set of eyes."

Furthermore, Informant 4 added that it is:

"an eye-opener for me because there were things that I took for granted and it made me appreciative of the small and big things in life. It gave me a more positive outlook in life."

These patients expressed gratitude for being alive and surviving COVID-19, while appreciating life even more as survival of the disease reminds them not to take it for granted. They had realizations which made life more meaningful to them. This is because critical illness is a life-changing event that involves physiological, psychological, and cognitive factors that have a significant impact on one's well-being. The experience of going through COVID-19 resulted in some of the informants interpreting their survival as a gift from God.

Informant 5 stated:

"While I was admitted I learned that we had our first doctor who didn't survived COVID. So I got more afraid, and I prayed more. And then the X-ray results at that time showed that my pneumonia is progressing so I'm praying that it won't get to critical stage. So when I got extubated and then I realized that I survived I was really amazed by God's work that I survived."

This patient found spirituality to be the answer even in the most difficult conditions. Despite being faced with a serious illness and the prospect of suffering, some people have discovered meaning and reason through spirituality (Albaugh, 2003). According to Livneh (2000), finding refuge in or consciously relying on faith and spirituality improves patients' psychological well-being and allows for a smoother adjustment to the medical aspects of their illness.

Stressful situations, such as those triggered by the coronavirus pandemic, have a

significant impact on a person's psychological functioning and well-being, and can eventually lead to psychological problems like anxiety, confusion, social isolation, and depression (Ingram and Luxton 2005; Yildirim and Arslan 2020). While the COVID-19 experience can be detrimental to people's mental wellbeing, this may not be the case with all patients. Individual differences in resilience, coping, and expectations can all affect how a person reacts to adversity.

Conclusion

COVID-19 survivors' lived experiences were described as challenging, horrifying, and eye opening. Prevalent thoughts and reactions upon receiving laboratory confirmation of being COVID-19 positive were fear, denial, acceptance, and total dependence on the Lord. In relation to their struggles for healthcare accessibility, most of them stated they had easy access to it and at the same time narrated challenges in health care which include the lack of nurses, embarrassment to ask for assistance, not being allowed to see their loved ones, and that there were hospitals which were unable to admit COVID patients. Coping strategies of the survivors include support from their families, friends, and church members; faith in God, and mental preparedness. In relation to the impact of disease survival on their daily lives, most of them became physically healthy while some became weaker; psychologically they were able to value others while socially some gained popularity, and most of them developed closer relationships with their families, friends, and colleagues. Spiritually, most of them have renewed their faith and became more reflective while some doubted God’s goodness. Insights on the illness experience include the need to be healthy, being knowledgeable, cooperative and calm; value time with loved ones, and having a support group.

Recommendations

The following recommendations can be taken into consideration based on the study's findings and conclusions:

The development of a health education program aimed at addressing the needs of COVID-19 survivors in addressing their fears and anxieties and educating them on lifestyle changes, as well as the formation of support groups, should be initiated as this would improve the quality of life.

It is worth noting that while most of the informants had easy access to healthcare, this was because they were among the first few cases of COVID-19 in March 2020, during which the Philhealth shouldered all treatment expenses related to the disease. This is not true with present day COVID-19 patients. It is therefore suggested that future researches select informants of varying socioeconomic status to come up with a heterogeneous group thus acquiring varied results. It is also suggested that the survivors’ relatives be interviewed in order to gain a different viewpoint of the disease. Further, a similar study may be conducted now because the responses of present survivors may differ from our findings, seeing our informants are from the first group of COVID-19 patients. Future researchers may also study COVID-19 patients and survivors to fill in the gaps in mental health research related to COVID. Overall, they may use data from this study if they choose to conduct a study in line with COVID-19.

It is also recommended that the government should coordinate with multiple sectors in the pandemic response and come up with a real-time record of preventive and curative

interventions done that were proven effective in managing COVID-19. Proper dissemination of information to the public and anti-misinformation campaigns should also be strengthened to gain the trust of the public leading to more efficient strategies in controlling this pandemic.

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The Relationship of Eating Habits and Lifestyle Choices on the Prevalence of Lifestyle-Related Diseases Among Call Center Agents

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Abstract

This study determined the eating habits, lifestyle choices and prevalence of the lifestyle related diseases among selected call center agents in Metro Manila. A survey questionnaire collected socio-demographic profiles, lifestyle characteristics, and eating patterns and habits from 103 purposively sampled respondents. Data was subjected to descriptive correlational analysis to determine how socio-demographic profile and lifestyle and eating practices predict lifestyle-related diseases among the respondents. The results revealed that the socio-demographic profile and lifestyle related diseases among call center agents in Manila were found to have a strong positive correlation ($r = 0.725$, $p < 0.05$) which validates that lifestyle related diseases are common in individuals who have unhealthy practices towards food, physical activity, and vices. More research is needed to re-evaluate the call center agents' health status, risk of and prevalence of lifestyle related diseases among them after the pandemic, considering the current work from home set up which may have or not have aggravated their eating habits, lifestyle choices, and physical activity.

Keywords: *lifestyle related diseases, call center agents, business process outsourcing, eating and lifestyle practices*

Health is one of the Filipinos' most important concerns since every citizen strongly values health and well-being. However, many have ignored the countless choices that confront humanity with how they live, work, and play that can potentially damage our bodies and minds, or even cost our lives. Often, we only recognize the importance of health when we are sick, injured, disabled, or faced with the potential loss of productivity, wellbeing, or life itself.

Business Processes Outsourcing (BPO) companies in Metro Manila are centered on the core business and source their non-core activities such as payment services, customer services and management. Although working in the BPO sector has ensured that young adults achieve their job achievements and financial goals even faster than before, statistics and anecdotal evidence indicate that employees in the BPO sector are reporting high levels of stress and its related illnesses (Smith & Smith, 2017). Due to the good work environment, attractive lifestyle, and remuneration packages, international call centers are one of the most sought-after places for young graduates (Chaudhury & Modi, 2016). According to the World Health Organization (2015) lifestyle related diseases are considered a major public health concern worldwide. They account for 60 percent of total deaths globally (with 40 million deaths estimated occurring annually), and it contributes to 40 percent of universal disease burden annually. Kurata and Peralta (2016) stressed that the cause of this type of disease is

related to the type of food cause, lifestyle, eating habits, tobacco use, and alcohol over-drinking, contributing to the worsening existence of lifestyle-related diseases including new types of cancer that are prevalent not only in the BPO business but also in other sectors.

The purpose of this study was to investigate the eating habits, lifestyle choices, and prevalence of lifestyle related diseases among call center agents in Business Process Outsourcing (BPO) companies located in Metro Manila. This will help to understand how the eating habits and lifestyle choices are significant on the call center agent's health in the prevention of known lifestyle related diseases that contributes to the rate of mortality in the country. Once this knowledge is gained, interventions intended to attenuate lifestyle related diseases can be designed and implemented. Specifically, this study answered the following questions:

1. What is the socio-demographic profile of the respondents in terms of age, gender, civil status, weight, height, work schedule, unhealthy eating habits, vices, blood pressure level, years of service in the company, work assignment/location, medical history?
2. What lifestyle related diseases affect the health status of call center agents in selected Business Process Outsourcing (BPO) companies in Metro Manila?
3. Is there a significant relationship between the lifestyle related diseases among call center agents in selected Business Process Outsourcing (BPO) companies in Metro Manila when grouped according to their demographic profile?

Methodology

Research Design

The research method used in this study is a quantitative descriptive type. A descriptive cross-sectional survey design was adopted in this research, the survey design was chosen because it provides means to contextually interpret and understand the eating habits, lifestyle choices and prevalence of lifestyle related diseases among call center agents in selected Business Process Outsourcing companies in Metro Manila. This design enables the generalization of findings in a large population. Sekaran (2005) argues that a descriptive study shows an accurate profile of individuals, events or circumstances describing the existing circumstances and attitudes through observation and interpretation techniques. Descriptive correlational design was selected for fulfilling the aim of this study since there is an observation determining the relationship between variables. It is descriptive in purpose, gathering demographic profile, and identifying the respondent's profile and the essential information about their health conditions. It is a correlational in purpose to analyze and identify possible relationships between the identified variables. It is descriptive in purpose, gathering demographic profile, and identifying the respondent's profile and the essential information about their health conditions Data collection was done with the use of a standardized questionnaire which aimed to determine the frequency, percentage and other statistical calculations thus identifying this study as a quantitative research. This study followed a quantitative research model using an explorative and descriptive design to assess the eating habits, lifestyle choices and prevalence of the lifestyle related diseases among call center agents of BPO companies in Metro Manila.

Population and Sampling Techniques

The population was drawn from selected BPO companies in Metro Manila and the researcher selected employees to participate in the study. A survey questionnaire was given to 103 purposively sampled respondents who met the following inclusion criteria:

1. They should be working as call center agents of selected Business Process Outsourcing companies in Metro Manila.
2. They should be working in the Business Process Outsourcing for at least less than a year.
3. They should be willing to participate in the study.

The sampling method used is purposive. Purposive sampling, also called a judgmental sample is one that is selected based on the knowledge of a population and the purpose of the study. The subjects were selected because of their common characteristics and the others do not have (Babbie, 2007). The main goal of purposive sampling is to focus on particular characteristics of a population that are of interest, which will best answer the researcher's questions (Laerd, 2012).

Instrumentation

This study made use of the systems approach in the conceptualization of the framework patterned after Bertalanffy's (1968) Systems Theory. The researcher utilized a validated survey questionnaire to elicit the responses from the selected respondents regarding their socio-demographic profile and the health conditions of call center agents at the selected BPO companies in Metro Manila. The research instrument in the form of a survey questionnaire was composed of three parts. The first part consisted of the socio-demographic profile of the respondents. Questions regarding health conditions of call center agents from selected BPO companies were the contents of the second part of the questionnaire. The third and final part of the questionnaire were questions relative to the unhealthy practices leading to the lifestyle related diseases among call center agents of selected BPO companies in Metro Manila.

To ensure trustworthiness of the data, the concepts of credibility, usability, transferability, conformability, and dependability must be addressed (Guba & Lincoln, 1989). Credibility, in the proposed study, was established through data triangulation.

Data Analysis

Descriptive and inferential statistics were employed to analyze data obtained from the respondents in the selected Business Process Outsourcing companies in Metro Manila. Several statistical calculation tools were employed to assess and test the correlation between each dependent variable construct and the independent variables. Frequency and percentage distribution were used to determine the weighted percentages and distribution of the traits or characteristics of the respondents in terms of their personal profile. Weighted arithmetic mean was utilized to determine each item in the survey questionnaire's relative importance of each. Weightings give due importance to each item in the survey questionnaire and determine the descriptive ratings. Pearson Product Moment Coefficient of Correlation was used to determine

the significant relationship between the lifestyle related diseases among call center agents when they are group into their demographic profile.

Ethical Considerations

Ethical considerations were observed to ensure confidentiality and anonymity of the respondents. Informed consent was obtained prior to releasing the questionnaires. Since questionnaires contain the information about the respondents' demographic profile and questions for the researchers' data, only the researcher and the respondent have access to the questionnaires and the respondent's personal data.

Results and Discussion

The demographic profile of the respondents is portrayed on the succeeding tables. Table 1 presents the summary distribution of the age range among the respondents of this study and has been calculated using a descriptive statistical approach. The highest frequency count among the respondents have shown on the age range between 27 to 30 years old which has a frequency count of 27. It is followed by respondents whose ages were between 23 to 26 and 31 to 34 years old wherein both age ranges were 26.21 and 21.36 percent of the total population, respectively.

Table 1. *Summary Distribution of Respondent's Age*

Age Distribution	Frequency	Percentage (%)
19 - 22	17	16.50
23 - 26	22	21.36
27 - 30	27	26.21
31 - 34	22	21.36
35 - 38	10	9.71
39 - 42	2	1.94
43 and above	3	2.91

In terms of the respondents' gender, most were female with the frequency count of 64 (62.1%). Meanwhile, there were 39 male (37.9%) respondents who participated.

Table 2. *Summary Distribution of Respondent's Gender*

Gender	Frequency	Percentage (%)
Male	39	37.9
Female	64	62.1
Total	**103**	**100%**

The respondents' awareness relative to having a diabetes or high level of blood sugar is presented on Table 4. The large part of the population of the respondents who participated in the study have answered that they are not diabetic with a frequency count of 97 (94.2%). On the other hand, 5.8% of the respondents answered that they do not know their condition if they are diabetic or not.

Table 4. *Summary Distribution of Respondent's Diabetic Condition*

Diabetic Condition	Frequency	Percentage (%)
No	97	94.2
Don't Know	6	5.8
Total	**103**	**100%**

A total of 99 (96.1%) respondents were not alcohol dependent based on their answers on the survey questionnaire while 4 admitted that they do not know their condition.

Table 5. *Summary Distribution of Respondent's Alcoholism*

Alcoholism	Frequency	Percentage (%)
No	99	96.1
Don't Know	4	3.9
Total	**103**	**100%**

The respondents have been assigned as call center agents of the BPO companies in Metro Manila and their work is most likely related to Information Technology and computer utilization. The respondents answered that they were assigned in various computer related works and assignment, and their work location is in Metro Manila.

Table 6. *Summary Distribution of Respondent's Work Assignment or Location*

Work Assignment/Location	Frequency	Percentage (%)
Computer Work in Metro Manila	100	100.0
Total	**103**	**100%**

There are 54 respondents out of 103 total respondents who have worked in the selected BPO industries in Metro Manila for a minimum of 0 to 3 years in service which is being followed by employees who have serve their companies for at least 4 to 7 years with a frequency value of 25 and an equivalent percentage value of 24.3. The least frequency count is those employees with 8 to 11 years of service in the Business Process Outsourcing industry with a frequency count of 24 and have shared 23.3 percent of the population.

Table 7. *Summary Distribution of Respondent's Years of Service*

Years of Service	Frequency	Percentage (%)
0 - 3	54	52.4
4 - 7	25	24.3
8 - 11	24	23.3
Total	**103**	**100%**

Lifestyle Indicator Variant of the Respondents

Table 8 presents the summary distribution of the respondent's body weight based on the body mass index to determine if respondents are having normal weight, overweight, or underweight. Majority of the respondents has recorded body mass index (BMI) of 25 to 29.9 which falls under the category of being overweight, with a corresponding frequency value of 41 and a percentage value of 39.8. This is being followed by the respondents who have BMI of less than 25 wherein it constituted 26 different respondents while to the frequency count are those respondents with recorded BMI of more than 30.

Table 8. *Summary Distribution of Respondent's Body Weight*

Body Weight	Frequency	Percentage (%)
BMI <25	36	35.0
BMI =25-29.9	41	39.8
BMI =30+	26	25.2
Total	**103**	**100%**

The physical activity of the respondents has been presented on Table 9 showing three different categories based on the survey questionnaire administered among the respondents. with a total of 41 (43.7%) respondents admitted to have no regular physical activity which has the highest frequency count.

Table 9. *Summary Distribution of Respondent's Physical Activity*

Physical Activity	Frequency	Percentage (%)
No regular physical activity	45	43.7
2 to 3 days per week	42	40.8
4 to 7 days per week	16	15.5
Total	**103**	**100%**

The vast majority of the respondents in this study are non-smokers based on the survey. Table 10 shows that 80 out of the 103 respondents do not smoke. However, there are 14 among them who have currently smoke and 9 respondents who previously smoke or have been exposed to second-hand smoking from their colleagues.

Table 10. *Summary Distribution of Respondent's Smoking Status*

Smoking Status	Frequency	Percentage (%)
Non-smoker	80	77.7
Ex-smoker or frequent 2nd hand smoke or pipe	9	8.7
Currently smoke	14	13.6
Total	**103**	**100%**

The summary of the respondents' diet and consumption of food that affect the health of the call center agents of the selected BPO companies in Metro Manila are shown on Table 11. The consumption of several foods and the frequency of intake of some food greatly affect the health conditions of an individual. In terms of red meat, the recurrence of intake among the majority of the respondents was every week wherein it has a frequency count of 68 and a percentage value of 66.0. There were 31 respondents who answered that they consume red meat for only 1 to 3 times a month while 4 of them have never ate red meat. The huge number of respondents has consumed whole grains at an amount of less than 1 serving per day with a corresponding frequency count of 43 which is equivalent to 41.7 percent of the total population while 42 of them have consumed at least 1 to 2 servings per day. However, there were 18 respondents who have consumed more than 3 servings per day.

This is being followed by the respondents' daily consumption of fruits and vegetables. Majority of the respondents consumed 0 to 2 servings daily while some respondents have consumed around 3 to 4 servings per day. Notwithstanding, there are only 5 respondents who have answered that they have consumed more than 5 to 9 servings daily relative to eating fruits and vegetables and make it part of their daily meals. In terms of the daily absorption of nuts and seeds, the results showed that majority of the respondents only consumed 0 to 2 servings per day which is tantamount to a frequency value of 78 and a subsequent percentage value of 75.7 while 19.4 percent have consumed 3 to 4 servings weekly. There were only 5 respondents who have consumed more than 5 servings per week.

Table 11. *Summary Distribution of Respondent's Diet*

Red Meat Intake		
Recurrence of Intake	**Frequency**	**Percentage (%)**
Never	4	3.9
Every Week	68	66.0
1 to 3 times a month	31	30.1
Total	**103**	**100%**

Whole Grains Intake		
Recurrence of Intake	**Frequency**	**Percentage (%)**
<1 serving/day	43	41.7
1 to 2 servings/day	42	40.8
>3 servings/day	18	17.5
Total	**103**	**100%**

Fruits and Vegetables Intake		
Recurrence of Intake	**Frequency**	**Percentage (%)**
0-2 servings/day	75	72.8
3-4 servings/day	23	22.3
5-9+ serving/day	5	4.9
Total	**103**	**100%**

Nuts and Seeds		
Recurrence of Intake	**Frequency**	**Percentage (%)**
0-2 servings/week	78	75.7
3-4 servings/week	20	19.4
5+ servings/week	5	4.9
Total	**103**	**100%**

The subsequent table shows the respondents' adequacy of sleep on a regular basis which greatly affects their health status. Based on their responses, majority of the respondents have inadequate sleep as reflected on the table below wherein 40 among the respondents have seldom completed the required number of sleep every night. This is being followed by respondents who have enough number of hours of sleep for at least 3 to 4 days a week however the undermost frequency count on the list is the respondents who have slept most of the time normally 5 to 7 days a week with a frequency value of 27 and an equivalent percentage value of 26.2.

Table 13. *Summary Distribution of Respondent's Adequacy of Sleep*

Adequacy of Sleep	Frequency	Percentage (%)
Seldom/less than 3 days/week	40	38.8
Occasionally/ 3-4 days/week	36	35.0
Most of the time 5-7 days/ week	27	26.2
Total	**103**	**100%**

The respondents' blood pressure level has been depicted on Table 15 which shows if the respondents were hypertensive or not., The results revealed that 45 (43.7%) of the respondents have a blood pressure level of 120/80 to 139/89 followed by respondents who have blood pressure levels of lower than the 120/80 range. On the other hand, 15 (14.6%) respondents have 140/90 and above blood pressure level.

Table 15. *Summary Distribution of Respondent's Blood Pressure Level*

Blood Pressure Level	Frequency	Percentage (%)
Under 120/80	43	41.7
120/80 to 139/89	45	43.7
140/90 +	15	14.6
Total	**103**	**100%**

Table 16 presents the respondents' blood cholesterol level. Majority of the respondents have normal blood cholesterol as depicted on the total cholesterol levels of less than 200 and low-density lipoprotein cholesterol of less than 130. However, 17 respondents have moderately high level of total cholesterol both total cholesterol and bad cholesterol levels. There were 5 respondents who have been found to have high cholesterol levels.

Table 16. *Summary Distribution of Respondent's Blood Cholesterol Level*

Blood Cholesterol Level	Frequency	Percentage (%)
Total Chol. <200/ LDL <130	37	63.0
Total Chol. 200-239/ LDL 159-130	17	29.0
Total Chol. 240+/ LDL 160+	5	8.0
Total	**59**	**100%**

Healthy Eating Index of the Respondents

The eating practices among the respondents have been summarily presented on Table 17wherein it is divided into several categories, frequency, and percentage values. that the results revealed that majority among the respondents have not skipped their breakfast. On the other hand, 32 respondents which are about 31.1 percent skipped their regular breakfast. All the same, there were about 17.5 percent of the total respondents who have occasionally or have never eaten breakfast on a regular basis. The daily consumption of the respondents of the whole grain and cereal showed that 0 – 2 servings per day on a regular basis has the highest frequency and percentage count and being followed by those respondents who have consumed at least 3 servings daily with a frequency and percentage value 23 and 22.3, respectively. The nethermost frequency count among the list is 4 or more servings wherein it has 8 respondents equivalent to 7.8 percent.

The daily consumption of the respondents on fruits and vegetable has been divided into three categories as presented on Table 17. Apparently, majority of the respondents have regularly consumed 0 to 4 servings of fruits and vegetables on a daily basis while there are only 20 respondents (19.4%)have consumed 5 to 6 servings per day. However, there are only 2 among the 103 total respondents who have consumed 7 or more servings on a daily basis. The types of fats and spreads being consumed by the respondents might generally affect their health condition. In accordance with the result of the descriptive statistical analysis, the large number of the respondents has utilized butter or stick margarine and shortening as consumed on a regular basis while there are 41 respondents equivalent to 39.8 percent of the total have primarily consumed soft tub margarine and vegetable oil on a regular basis. Although, there are only 14 respondents out of 103 total respondents who have strictly used vegetable oil and trans-fat free margarine. This is being followed by the respondents' consumption of meat and protein rich products as stated on the table based on the total number of respondents of 103, there are 58 respondents who have consumed red meat including steak/hot dogs/hamburger and/or sausage on a regular basis. It is also evidently shown that there are 40 (46.6%) respondents who have normally consumed lean meat, skinless poultry, and fish and they have seldom eat or consumed red meat in their usual meal while there are only 5 respondents who have reported that they usually eat peas, beans, lentils, nuts, soy proteins, tofu and other plant based protein foods.

Table 17. *Summary Distribution of Respondent's Eating Practices*

Breakfast		
Recurrence of eating breakfast	**Frequency**	**Percentage (%)**
Every day	53	51.5
Most days (5 or more times/ week)	32	31.1
Occasionally or never	18	17.5
Total	**103**	**100%**

Whole Grain Bread/Cereal		
Daily Consumption	**Frequency**	**Percentage (%)**
0 – 2 servings	72	69.9
At least 3 servings	23	22.3
4 or more servings	8	7.8
Total	**103**	**100%**

Fruits and Vegetables		
Daily Consumption	**Frequency**	**Percentage (%)**
0 to 4 servings	81	78.6
5 to 6 servings	20	19.4
7 or more servings	2	1.9
Total	**103**	**100%**

Spread and other fats intake		
Kinds of Spread or Fats Consumed	**Frequency**	**Percentage (%)**
Only use vegetable oils and trans-fat free margarine	14	13.6
Primarily use butter or stick margarine and shortening	48	46.6
Primarily use soft tub margarine and vegetable oils	41	39.8
Total	**103**	**100%**

Meats and Protein Food intake		
Kinds of Protein Foods Consumed	**Frequency**	**Percentage (%)**
Eat primarily peas/beans/ lentils/nuts/soy proteins/tofu and other plant-based protein foods	5	4.9
Regularly eat red meat including steak/hot dogs/hamburger and/or sausage	58	56.3
Seldom eat meat or limit it to only lean meat skinless poultry or fish	40	38.8
Total	**103**	**100%**

Dairy Products		
Kinds of Dairy Products Consumed	**Frequency**	**Percentage (%)**
Use only low-fat milk/cheese/ cottage cheese or yogurt	26	25.2
Use only nonfat milk/cheese or yogurt or use soymilk	12	11.7
Use regular milk/cheese/cottage cheese and yogurt	65	63.1
Total	**103**	**100%**

Legumes, Dry Beans/Peas Consumption		
Daily Consumption	**Frequency**	**Percentage (%)**
Daily	1	1.0
0 to 2 times/week	85	82.5
3 - 6 times/week	17	16.5
Total	**103**	**100%**

Nuts, Seeds, Nuts Butter		
Daily Consumption	**Frequency**	**Percentage (%)**
Daily	6	5.8
0 to 3 times per week	72	69.9
4 to 5 times per week	25	24.3
Total	**103**	**100%**

Salt and Salty Foods Intake		
Amount of Consumption	**Frequency**	**Percentage (%)**
Always add additional salt to food at meal time and often eat salty foods	23	22.3
Occasionally add additional salt to food or eat salty foods	60	58.3
Use salt sparingly and limit intake of salty foods	20	19.4
Total	**103**	**100%**

Highly Glycemic Foods Intake		
Daily Consumption	**Frequency**	**Percentage (%)**
Limit sweets/ only eat sweets occasionally or in small amounts	52	250.5
Love sweets/ eat them every day	40	38.8
Seldom eat sugar rich foods/ and eat primarily fresh fruit and pure fruit juices	11	10.7
Total	**103**	**100%**

Sodas and Sweets Intake		
Daily Consumption	**Frequency**	**Percentage (%)**
Always add additional salt to food at meal time and often eat salty foods	56	54.4
Occasionally add additional salt to food or eat salty foods	20	19.4
Use salt sparingly and limit intake of salty foods	27	26.2
Total	**103**	**100%**

Water Intake		
Daily Consumption	**Frequency**	**Percentage (%)**
Less than 5 glasses per day	9	8.7
5 to 7 glasses daily	44	42.7
8 to 10 glasses daily	50	48.5
Total	**103**	**100%**

The results showed that the majority of the respondents have consumed regular milk, cheese, cottage cheese, and yogurt which represent the 63.1 percent of the total population. However, there are only 26 respondents or 25.2 percent of the respondent's population who have utilized low fat dairy products while there are only 12 respondents who have consumed non-fat dairy products. The above table has revealed that 82.5 percent of the respondents have reported that they have consumed for at least 0 to 2 times per week of legumes, dry beans/peas, while there are only 17 of them out of 103 total respondents who have consumed those products for 3 to 6 times every week. Unfortunately, there is only 1 percent of the population who has consumed it on a daily basis. Consequently, the consumption of the respondents of the nuts, seeds, and nuts and butter shows that majority of the respondents consumed these for 0 to 3 times every week followed by 4 to 5 times per week and the least on the list is daily consumption.

The highest frequency count of the respondents pertaining to the consumption of salt and salty foods, there are 60 respondents out of 103 total respondents who occasionally add additional salt to food or eat salty foods while 23 among the respondents who always consumed salty food and regularly add salt on their food as part of the seasoning. On the other hand, there are 20 respondents equivalent to 19.4 percent of the total who have rarely used or include salt on their food. Seemingly, there is a vast majority on the number of respondents who have consumed highly glycemic foods on a day to day basis based on their answers from the survey questionnaire. There is a considerable number of respondents who have rarely engaged in eating highly glycemic food as they reported that they eat those food fewer times in a week. Contrarily, there is a little amount of percentage among the respondents who have sporadically eaten highly glycemic food or ingest a very little amount of the food.

Similar to the previously discussed type of food, sodas and sweets are also essential food which can be attributed to the lifestyle related diseases due to overconsumption of those kinds of food. The above table has revealed that majority number of the respondents has a limited consumption of sodas and sweetened products while there are 27 respondents who seldom consumed sugar rich foods but rather prefer fruit juices as their beverage. Contrarily, there are 20 respondents out of 103 total participants who consumed sweets and sodas on a regular basis. Water intake among the respondents has been presented on the above table which clearly shows that majority of the respondents have intake of at least 8 to 10 glasses daily while 44 out of 103 total respondents who have intake of minimum of 5 to 7 glasses of water on a daily basis. There are only 9 respondents equivalent to 8.7 percent of the total who have reported that they have consumed fewer than 5 glasses a day.

Relationship between Respondent's Profile and Lifestyle Related Diseases

The significant correlation between the respondent's profile and the lifestyle related diseases among them has been acquired through statistical calculation and analysis. The table below has shown that there is a strong correlation between the two variables based on the value of the correlation coefficient being obtained while they are also statistically significant since the computed p-value is less than the threshold of 0.05. This concurs the results of the study of Hansen (2017) which emphasized that lifestyle related diseases are common on individuals who have unhealthy practices including food, physical activity, vices, among others. Lifestyle related diseases are not transferred from one person to the other, as they occur in a non-contaminating individual. Lifestyle related diseases are chronic in nature, which often prolongs the course of

treatment and continues for years before the person can opt for care or therapy. These diseases usually produce conditions that prohibit people from functioning on a daily basis. Lifestyle related diseases are caused by apparently different factors, such as accelerated unplanned urbanization, the globalization of unhealthful habits and aging populations. Apparent symptoms such as high blood pressure, decreased blood glucose, elevated blood lipids, and obesity can be indicative of profoundly deceptive lifestyle patterns.

Table 18. *Relationship between Respondent's Profile and Lifestyle Related Diseases*

	Correlation	Significance	Verbal Interpretation
Respondent's Profile	0.725	0.002	Strong Correlation/Significant
Lifestyle Related Diseases	0.725	0.002	Strong Correlation/Significant

According to the report by WHO (2019), 60% of all deaths worldwide in 2005 (35 million) resulted from non-communicable diseases and accounted for 44% of premature deaths. Around 80% of these deaths will occur in low and middle-income countries like India. Almost half of those who die from chronic diseases will be in their productive years. The report also points to the fact that countries like Brazil, China, Russia and India currently lose more than 20 million productive life-years annually to chronic diseases, and the number is expected to grow by 65% by 2030. In 2007, nearly 3.1 billion people were economically active. The figure is estimated to exceed 3.6 billion in 2020. The cost to employers of morbidity attributed to non-communicable diseases is increasing rapidly. Workplaces should make possible healthy food choices and support physical activity. Unhealthy diets and excessive high glycemic food intake, physical inactivity and tobacco use are major risk factors for lifestyle related diseases such as diabetes mellitus, heart disease, hypertension, and stroke particularly because of the nature of their job and unhealthy lifestyle practices. This is similar to the findings of Nyirenda (2016) which pointed out that hypertension is sometimes considered a concealed attacker, because it is often asymptomatic until it is serious, and the necessary organ dysfunction has emerged. An individual with severe hypertension may experience a variety of symptoms related to effects on the blood vessels of the different organs and tissues, or elevated cardiac workloads. Such side effects include fatigue, decreased activity speed, dizziness, palpitations, angina and dyspnea. It has been known for the past the symptoms of hypertension include diarrhea, nosebleeds and dizziness. Nevertheless, if blood pressure level is exceptionally strong or low, these consequences in persons with hypertension are no more serious than in the general population. Similarly, Smith and Smith (2017) reported that current hypotheses relate the causes of diabetes, individually or in combination, to factors such as obesity, stress, genetic, autoimmune, viral and environmental.

People who work in night shifts are experiencing a disrupted biological clock that contributes to insomnia, indigestion, and acidity, lack of appetite, fatigue, irritability, depression, mood swings and body pain. Many that have late night parties often witness the same with certain added consequences of mumming, partying and smoking prematurely. Changes in a person's circadian rhythm impair his or her defense, contributing to multiple opportunistic illnesses. To counter these diseases with balanced food, physical exercise and sufficient regard for the biological clock, a safe lifestyle must be taken. For should the problems induced by

workplace postures, lengthy sitting hours should be avoided, and regular breaks should be taken for relaxation or any tasks requiring physical movements. A person contour-based ergonomic chair can be built to suit the correct seating pose so as to reduce the irregular strain on joints and muscles. These are efficient steps that can be incorporated into our lives that will improve health (Thakur et al., 2016).

Based on the research findings, majority of the respondents' age range between 27 to 30 years old and most of them are female. In terms of civil status, the vast majority of the respondents are single. According to the frequency and percentage distribution, most of them are not diabetic based on their responses obtained from the survey tool. They are currently working as call center agents and assigned to various computer related works in Metro Manila. Most of them have spent a minimum of 0 to 3 years working at the BPO companies. With regard to their health practices, most of the respondents have unhealthy practices such as having no regular physical activity, are overweight, and have inadequate hours of sleep, poor nutrition, vices which leads to the development of non-communicable diseases such as heart diseases, diabetes mellitus, stroke, and hypertension. The significance and relationship between the respondents in relation to lifestyle related diseases have positive result based on the statistical analysis done by the researcher which says that socio-demographic profile of the respondents have proportional impact on the lifestyle related diseases which can be developed by the respondents depending on their lifestyle practices in their day to day lives.

In light of the conclusions, there should be a continuous management support on the awareness program and ensuring the health among call center agents in the Business Process Outsourcing industry. An intervention or workplace program by means of incentive and merit by the Business Process Outsourcing management is recommended to promote healthy practices among their employees. There should be a regular physical examination and orientation program by the company to determine the health status of each of the employees and to reinforce healthy practices. For future studies, more research is needed to re-evaluate the call center agents' health status, risk of and prevalence of lifestyle related diseases among them after the pandemic, considering the current work from home set up which may have or not have aggravated their eating habits, lifestyle choices, and physical activity.

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Effect of *Poikilospermum suaveolens* (Hanopol) Leaf Extract on Non-Small Cell Lung Cancer Cell Lines

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Abstract

Among the main causes of morbidity and mortality in the Philippines, and even the world, is cancer, with malignancies of the lung leading majority of the cases. The rising statistic in this prevalence has driven many to rely on available treatment strategies that usually compose of chemotherapy and radiation. Combined with the adjunct tests and modalities, patients are usually exposed to exorbitant expenses and even unwanted side-effects. With this dilemma, the potential effects of Poikilospermum suaveolens was pursued with literature confirming the presence of several phytochemicals exhibiting anti-cancer properties. Using the crude ethanolic leaf extract of P. suaveolens, the 3-(4,5-dimethyl-2-thiazolyl)-2,5-diphenyl-2H-tetrazolium bromide (MTT) Assay was conducted to determine its effect on non-small cell lung cancer (A549) cell lines in vitro. A mean IC50 value of 26.58 µg/mL after three trials was elicited, falling under the range of moderate cytotoxic effect based on the American National Cancer Institute and the Geran Protocol. Furthermore, the concentration of the extract of P. suaveolens was found to be directly proportional to the percent inhibition of A549 cell lines. Morphological analysis followed after 24 hours affirming its cytotoxic properties, demonstrating notable changes in size and shape, decrease in cell number and other signs of apoptosis as observed under an inverted phase-contrast microscope. The results of both the MTT Assay and the subsequent morphological changes consistent with apoptosis observed in the A549 cell lines therefore strongly suggests the cytotoxic effect of the crude ethanolic leaf extract of Poikilospermum suaveolens.

Keywords: *poikilospermum suaveolens, lung cancer, MTT assay, phytochemicals, cytotoxic, A549 cell lines*

Cancer remains one of the leading causes of morbidity and mortality across the world, with approximately 70% of deaths attributable to it in low- and middle-income countries and a death toll estimate of 9.6 million in 2018 (World Health Organization, 2021). Asia has the highest incidence of mortality compared to other world regions, with 57.3% of global cancer cases due to cancer types associated with poorer prognosis and higher mortality rates (International Agency for Cancer Research, 2018). Lung cancer is responsible for the most significant number of cancer-related deaths, incurring a total of 21.77% in mortality worldwide (World Health Organization, 2021). It is also the most common type of cancer diagnosed in Filipinos and Filipino-Americans, comprising 24.3% of total cancer cases (Sales, Lin, & Palaniappan, 2020). Those

at the highest risk for the disease are people who are currently or used to smoke or people who have a family history of lung cancer at any age. However, even those who have never smoked are susceptible to indoor pollution and genetic mutation, as reported by the World Health Organization, is the two leading causes of lung cancer for non-smokers (Simon, 2018). Available treatment involves chemotherapy and radiotherapy; however, chemotherapy drugs are associated with unwanted effects like hair loss, bone marrow suppression which affects the production of blood cells, drug resistance, gastrointestinal lesions, neurologic dysfunction, and cardiac toxicity (Nussbaumer et al., 2011; Monsuez et al., 2010). Cancer treatment is also notorious for being costly. Part of this economic burden is caused by the long-term therapy that may or may not necessitate different modalities (e.g., surgery and radiotherapy in addition to chemotherapy) to eradicate the disease, if possible.

The lack of a non-invasive and long-term cure is still a subject of ongoing research. Nowadays, there is a global desire to develop natural alternatives to chemical drugs to combat various diseases, especially cancer. The adverse effects that usually accompany current management methods and the expensive cost of treatment for cancer have made it less appealing for patients to participate, thus prompting a spike in research involving alternative forms of treatment, especially the use of plants (Desai, 2008). There are already several standard drugs derived from plants that are used for cancer chemotherapy, as enumerated by Canoy et al. (2011). Worth noting here is the discovery of vincristine and vinblastine, vinca alkaloids which were the first plant-derived anti-cancer agents approved for use in the clinical setting. Although isolated from the plant Madagascar periwinkle (Catharanthus roseus G. Don.) as it was initially endemic in its namesake country and was culturally used for diabetes mellitus treatment, the samples for the discovery of these vinca alkaloids came from Jamaica and the Philippines (Cragg & Newmann, 2005).

Poikilospermum suaveolens, commonly known as Hanopol or Miracle Vine, is a plant growing in abundance in forests all over Asia. Folkloric uses of this plant to cure various illnesses such as eyesores and beriberi have been documented (Hanyadi & Ticktin, 2012). However, research regarding its potential effect on lung cancer cells was not done. Poikilospermum suaveolens, according to literature, has multiple phytochemicals such as flavonoids and tannins demonstrated by scientific research to have an inhibitory effect on cancer cell lines (Panyaphu et al., 2012), prompting us to conduct a study that would explore its potential impact on non-small cell lung cancer cells.

Methodology

The study uses an experimental research design as it aims to look for a cause-and-effect relationship between the treatment and control groups on the A549 cell lines. Specifically, it utilizes the pretest-posttest design, as measurements and observations had been conducted before and after the experiment for us to observe the changes and effects that took place after the various treatments were applied to the A549 cell lines.

Collection. The plants were collected near the Mahogany Residence Hall at Brgy. Nagkakaisang Kalat-kalat within the Adventist University of the Philippines campus. Identification The plant specimens were sent to the University of the Philippines – Los Baños Museum of Natural History for identification and authentication.

Preparation of Extract. One kilogram of Poikolospermum suaveolens leaves were

collected after the specimen's identification and authentication. Distilled water was used to wash the leaves and then air dried under a shade at room temperature (around 24-28°C). Using a mechanical blender, the dried samples were reduced to a fine powder. 100 g of the powdered plant materials were soaked and submerged completely in 1.5 L absolute ethanol for three days (72 hours) at room temperature with frequent agitation. During this soaking period, the ethanol separated the soluble components of the extract. The extract was then filtered using a Whatman no. 1 filter paper (Thakkar et al., 2014). Next, the solvent was concentrated in vacuo using a rotary vapor at 200 rpm in room temperature (Canoy et al., 2011). Afterwards, the concentrated extract was kept in a water bath at 55°C for evaporation of the solvent (Dhawan, D. & Gupta, J., 2017). The dry crude extract was transferred to a sterilized and sealed brown bottle for transport to the University of the Philippines Mammalian Cell Culture Laboratory.

Determining Treatment Concentrations. DMSO with a concentration of 0.2% was used as diluent (Nordin et al., 2017). In 10 mL of 0.2% DMSO, 40 milligrams of sample extract were dissolved obtaining a final concentration of 4 mg/ml. This was serially diluted in 0.2% DMSO to get the concentration of the extract as indicated and was then transferred to the culture plates (Tantengco et al., 2015).

Cell Viability Assay (MTT Assay). The researchers conducted an assay to obtain the cell survival/toxicity patterned after the method of Mosmann (1983) but with reservations. A549 cell lines were seeded separately at 4 x 104 cells/mL/well in sterile 96-well microtiter plates. To reach the log phase of their growth curve, the cells were incubated for 12 hours, with a temperature of 37ºC and 5% CO2 at 98% humidity.

The recovery of old media was done after an overnight incubation. The extracts were dissolved in dimethyl sulfoxide (DMSO). The cells were then treated with concentrations 100 µg/mL, 50 µg/mL, 25 µg/mL, 12.5 µg/mL, 6.25 µg/mL 3.12 µg/mL, 1.56 µg/mL, and 0.78 µg/mL. For the treatment of the cells in the positive control, Doxorubicin was used—an anticancer drug widely used for the treatment of carcinomas. 10 µL of Doxorubicin was dispensed on the plated cells to end up with the concentrations 25 µg/mL, 12.5 µg/mL, 6.25 µg/mL, and 3.125 µg/mL (Cawaling et al., 2015). DMSO-treated cells were the negative control; DMSO offers no cytotoxic activity on non-small cell lung cancer cells in concentrations up to 2% which made its use appropriate for the negative control (Wang et al., 2012).

In one plate, the control and each concentration of treated cells were performed in triplicate. For utmost validity, the experiment was repeated thrice. The cells then underwent incubation for 72 hours at 37ºC and 5% CO2. At least 3 trials were done per test extract with at least three replicate wells per concentration.

The media were replaced with 100 □L of fresh medium after the incubation period. To every well, 20 µL MTT dye at 5 mg/mL phosphate-buffered saline was added. The cells in the aluminum foil wrapped-plates once more ran through incubation at 37ºC and 5% CO2 for 4 hours. 110 □L medium was aspirated from each well, then to each well, 150 □L of DMSO was added. The preparations were thoroughly mixed using a pipette. The plates were re-incubated for 10 minutes. A spectrophotometer was used and set at 570 nm to read the optical density (OD) or absorbance.

The concentration that is required to kill 50% of the cell population, otherwise known as IC50 was computed using the linear regression of the graph of absorbance against concentration. The cytotoxic effects against A549 cells after 72 hours were recorded as IC50 and a comparison was done with the positive and negative control.

Morphological Characterization. An inverted phase-contrast microscope was used to observe both treated and untreated cells 24 hours after being subjected to the MTT Assay. Photomicrographs of the treated and untreated cells were taken. Morphological changes such as changes in size, shape, decrease in number and other signs of apoptosis were also observed. Statistical Analysis. The varying concentrations of the Poikilospermum suaveolens crude leaf extract used in the assay were correlated with its resultant percent inhibition using the Pearson's r Correlation to determine their corresponding relationship.

Results and Discussion

The MTT assay was used to assess the percent inhibition (%) of different concentrations of Poikilospermum suaveolens extract against non-small cell lung cancer cells (A549 cells). The following findings were collected:

Table 1. *Percent inhibition (%) and the 1C50 of each concentration of P. suaveolens extract against non-small cell lung cancer cells (A549 cells)*

Concentration (µg/mL)	**Percent Inhibition (%)**			
	Trial 1	**Trial 2**	**Trial 3**	**Mean**
0.78125	-3.35	-0.48	2.40	-0.48
1.5625	-0.10	-2.85	5.94	0.99
3.125	2.61	-2.53	7.84	2.64
6.25	5.40	-4.06	6.23	2.52
12.5	21.18	9.25	11.72	14.05
25	60.76	49.57	40.63	50.32
50	83.51	80.70	77.86	80.69
100	84.02	82.01	85.24	83.76
IC50	**22.22 µg/mL**	**27.55 µg/mL**	**29.96 µg/mL**	**26.58 µg/mL**

The results highlighted in Table 1 highly suggests that P. suaveolens inhibits non-small cell lung cancer cells. The lowest concentration (0.78125 ug/mL) yielded the least percent inhibition (%) with a mean of -0.48 whilst the highest concentration (100 ug/mL) yielded the greatest percent inhibition (%) of 83.76.

Overall Inhibitory Effect. The Inhibition Concentration 50 (IC50) for each trial was assessed using "GraphPad Prism 6" software, which calculated the IC50 of the sample by fitting the calculated percent inhibition for each concentration of the sample using a non-linear regression curve. A total of three trials were made with a mean IC50 of 26.58 µg/mL (Table 1). Figure 2 shows the percentage inhibition on the A549 cell line with the different prepared concentrations of P. suaveolens extract.

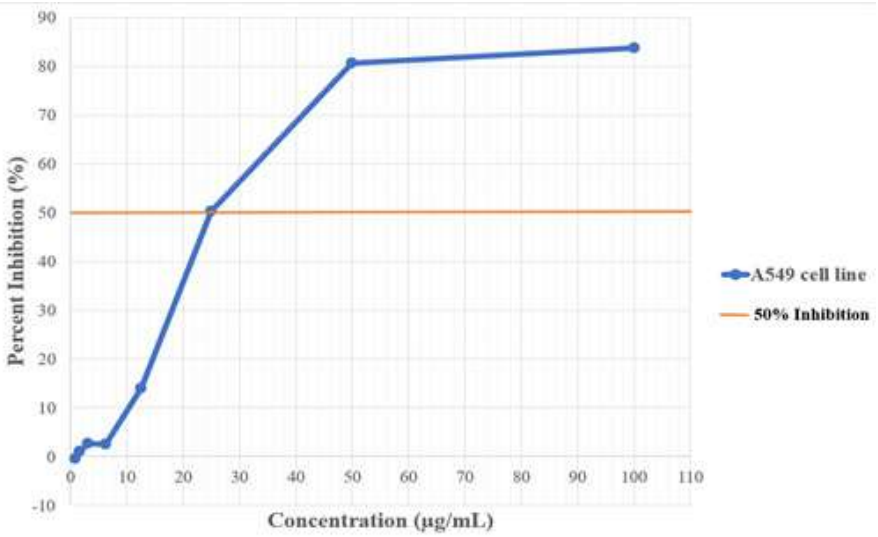

Figure 1. *Percent inhibition (%) on A549 cell line per concentration (µg/mL) of P. suaveolens leaf extract*

The computed IC50 of P. suaveolens leaf extract at 26.58 µg/mL is within the range of moderate cytotoxic effects, indicating its inhibition of non-small cell lung cancer cell line growth. The limit for activity of crude extracts run through preliminary assays shown to be potentially effective as anticancer agents is set at IC50 less than 30 µg/mL by the American National Cancer Institute (Vijayarathna et al., 2017). The reference for toxic cell activity is described by the National Cancer Institute and the Geran Protocol in the following range of values: IC50 values less than 21 µg/mL are considered to have a strong toxic effect on the cell, IC50 values between 21 and 200 µg/mL are considered to have a moderate effect, IC50 values between 201 and 500 µg/mL are considered weak and IC50 values above 500 µg/mL are considered non-cytotoxic (Amaani & Dwira, 2018). Phytochemicals known to be present in P. suaveolens as described by Panyaphu et al. (2012) are linked to its inhibitory effect on the cell line. These were highlighted by earlier discussions to be triterpene, flavonoids, alkaloids, saponin, and tannin, among others. Just as many agents currently used against cancer are plant-derived, the use of P. suaveolens as a source of phytochemicals against cancer cells with its presenting moderate inhibitory effects proves promising for further research.

In Figure 2, % inhibition against A549 cells showed a steep rise from the lowest concentration utilized until it made a plateau between 50 ug/mL and 100 ug/mL. We hypothesize that the greatest attainable cytotoxic response of the extract is around these concentrations. However, it is still not clear if this steady state is due to the maximal efficacy or ceiling effect of the phytochemicals since greater concentrations above 100 ug/mL were not employed in this study. In a therapeutic context, efficacy denotes the extent or degree of an effect that can be achieved in the patient. Subsequently, this study has shown potential for a development of a novel drug against lung cancer. It is worth mentioning that further studies to determine the maximal efficacy of Poikilospermum suaveolens must be done and it is important to understand the idealized relation in some detail because it underlies the more complex relations between dose and effect that occur when drugs are given to patients (Katzung, 2018).

Table 2. *Correlation between Percent Inhibition and Concentration of P. suaveolens Leaf Extract*

Pearson Correlation	.905***
Sig. (2-tailed)	0.002
N	8

Table 2 presents the correlation between percentage inhibition and concentration of P. suaveolens leaf extract. The percent inhibition (%) was found to increase as the concentration of P. suaveolens extract increases, as illustrated in Figure 1. It shows significant positive relationship at a level 0.01, with Pearson Coefficient = 0.905, p-value= 0.002. Therefore, this suggests that the higher the concentration of P. suaveolens crude leaf extract, the higher the percent inhibition.

Morphological Analysis. In this study, A549 cells before treatment and after treatment with different concentrations of P. suaveolens extract were observed under an inverted phase-contrast microscope for morphological changes such as changes in size, shape, decrease in number and other signs of apoptosis. Photomicrographs were taken to document these changes as seen in Figures 2-3.

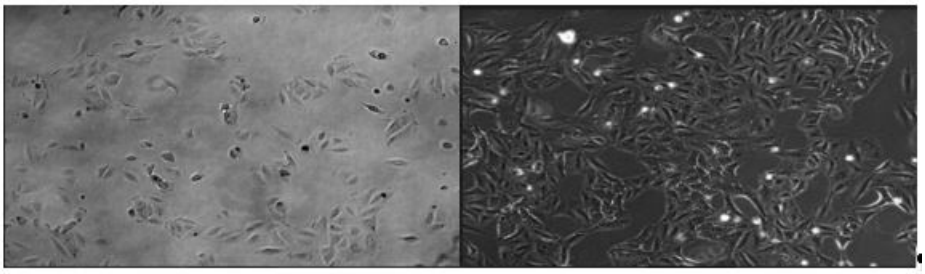

Figure 2. *A549 cells before treatment, showing a spindle-shaped cells and close adhesion. (Left) A549 cells in well; (Right) A549 in flask.*

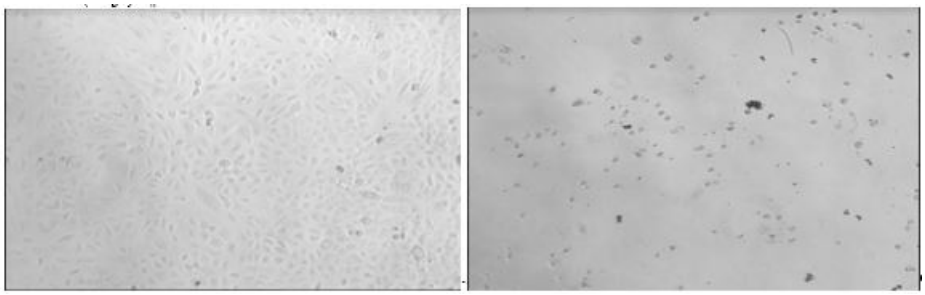

Figure 3. *A549 cells treated with the lowest concentration (0.78125 ug/mL) of P. suaveolens extract (Right) and A549 cells treated with the highest concentration (100 ug/mL) of P. suaveolens extract (Left).*

P. suaveolens caused cell death and inhibition on the growth of the A549 cell line used based on the changes observed in its morphology after the administration of the crude leaf extract. Figure 4 (Left) shows the photomicrograph of cells treated with highest concentration of P. suaveolens extract, demonstrating a dramatic decrease in cell number and features associated with apoptosis which includes cell detachment from its neighbors and decrease in cell size

(cell shrinkage). Figure 4 (Right) shows the status of the cells treated with the most minimal concentration of the P. suaveolens crude ethanolic extract, showing that apoptosis has not yet taken place, but is undergoing cell lysis, as shown by the disappearance of the phase-halo in contrast to the prominent phase-halo seen in untreated A549 cells in Figure 2. In terms of cell shape, A549 cells demonstrated physical alteration in Figure 5, becoming more round compared to the untreated A549 cells in shown in Figure 2.

Conclusion

Based on the findings of the study, we therefore conclude that the crude ethanolic extract of the leaves of Poikilospermum suaveolens have an inhibitory effect on A549 cells and that this effect is directly proportional to the concentration of the extract used against the cell lines. Thus, it could be potentially be a source of new and alternative therapy for treating cancer, specifically non-small cell lung cancer.

The in vitro analysis of this research only focused on the extracts P. suaveolens leaves and not the other viable parts of the plant such as the fruits, flowers or even the bark; therefore, it is recommended that a study to analyze potential cytotoxic activities of these components as well be done. Furthermore, as this study only utilized crude extraction, we also recommend the use of other extraction methods such as solvent partitioning and fractionation in order to fully assess the cytotoxic effects of the extract. Identification and isolation of the active phytochemicals and their mechanisms responsible for the inhibitory activity observed on the A549 cell line can also be conducted so more studies can be done in its full extent as an inhibitory agent, not only in non-small cell lung cancer cell lines but on various cancer cell lines as well. It is also further recommended to test the extract not only for its therapeutic effect, but also for its toxic effect on normal cells as data on this will be able to establish specificity and selectivity for the target pathologic cells.

More research is required to determine the efficacy of these plant products in treating lung cancers in vivo. An analysis of how P. suaveolens extract could be used as a complementary approach in the currently used chemotherapies for lung cancer may also be done so that we can highlight its anticancer potential when used alone or in combination with Doxorubicin and if it has a propensity to minimize the undesirable effects of the latter.

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