Selected Demographics as Factors Affecting Depression, Anxiety, and Stress Levels among Health-Allied Students

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Abstract: - Students, in general, have become more vulnerable to mental health problems such as depression, anxiety, and stress due to the ongoing COVID-19 pandemic. Several known factors contribute to high depression, anxiety, and stress (DAS) levels. Mainly, this study determined the prevalence of DAS among health-allied students as well as the association and effect of selected demographics, such as sex, current residential area (within Metro Manila or outside Metro Manila), current living status (with or without a companion), estimated monthly household income, academic program, and year level, on their DAS levels. Hence, an online survey was conducted among the Medical Technology, Pharmacy, and Biochemistry undergraduate students (n = 656) of the University of Santo Tomas. Results showed that, relatively, the most prevalent psychological distress among the respondents is anxiety. It was also found to be the only dependent variable that is significantly associated (p = .009) with as well as significantly affected by the selected demographics, particularly by sex (p = .003) and year level (p = .009). The remaining selected demographics showed no significance in the DAS levels of the respondents. The results were both substantiated as well as disproved by various gathered literature, discrepancies of which may be attributed to the differences in research methodology, biological factors, and sociocultural settings. Despite such variances, one thing remains consistent: the alarming rates of psychological distress among university students, particularly health-allied and medical students. The findings of this study could lead to a better understanding of what truly affects the DAS levels of health-allied undergraduate students. Therefore, future studies should be pursued to benefit students and encourage collaborative effort and actions from family members or guardians and academic institutions to tackle mental health problems.

Key Words: —*Psychological Distress, Depression, Anxiety, Stress, Mental Health, Health-Allied Students.*

I. INTRODUCTION

The ongoing COVID-19 pandemic considerably changed people's way of living around the globe due to several reasons such as extended lockdowns, abrupt changes in one's lifestyle, and many more. Given this, it is safe to assume that even the students' mental health was affected by the pandemic. Mental health is defined as an intrinsic aspect of overall health status: the cognitive, behavioral, and emotional well-being of a person that affects an individual's way of daily living [1]. Additionally, it is also defined as the collective facet of how a person thinks, emotes, communicates, and experiences life with others. The various determinants that could contribute to one's mental well-being are social, psychological, and biological elements that could potentially lead to particular psychological and personality variables [2, 3]. What makes mental health as relevant as physical health is that mental disorders can be equally harmful as physical problems, ultimately in some worst-case scenarios may lead to certain disabilities, according to WHO. Moreover, WHO [3] further explained that a damaged or problematic mental health affects an individual's ability to function and be socially competent. Through the information mentioned above, it is safe to assume that mental health issues

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are a problem that is timely and requires attention and, therefore, is a topic worthy of being researched.

Based on the study of Almhdawi et al. [4], it was found that mental health symptoms were statistically associated with sociodemographics (i.e., sex and academic program), physical well-being, dietary condition, satisfaction with the academic program, study difficulty, and musculoskeletal discomfort. The health-allied students were chosen as the respondents of the study due to the existing literature showing university students, particularly those who were taking medicine and health-allied programs, have experienced high levels of depression, anxiety, and stress (DAS) [5]. Depression, anxiety, and stress are the primary focus of this study, for they are all significant forms of psychological distress. Hernández-Torrano et al. [6] used bibliometrics to evaluate articles regarding the psychological well-being of university students. Based on the mentioned source, psychological distress can result in poor academic participation in terms of attendance, performance, engagement, and completion in the short run [7, 8]; and could lead to dropping out, failed or toxic relationships, difficulty in finding employment, lower personal income, and recurrent mental health problems in the long run [9, 10].

High levels of depression can lead to several other problems. Depression disorder has diverse symptoms such as loss of interest or pleasure, depressed mood, decreased energy, low self-worth, and poor concentration [11], while anxiety is an emotion or response of the body that can take place with no apparent triggering stimulus that goes along with tension, negative thoughts, and subsequent physical changes [12]. On the other hand, stress is a physiological reaction of an organism to anything that can pose a challenge or threat that exceeds the person's capacity [13]. The levels of DAS are considered essential markers for overall mental health assessment, and individuals are adversely impacted by the failure to identify and resolve these psychological disorders [14].

Several factors may influence DAS levels. However, in this study, only the following sociodemographic factors were considered: sex, current residential area (within Metro Manila or outside of Metro Manila), current living status (with or without a companion), academic program, year level, and estimated monthly household income. Multiple studies revealed that sociodemographic factors showing relationship with DAS levels are age, sex, academic program, year level, estimated monthly household income, and residential area [12, 13, 15- 17]. Therefore, this study intended to contribute to the existing literature in determining the sociodemographic factors affecting DAS levels among health-allied students. To measure the psychological distress levels of health-allied students, the Depression, Anxiety and Stress Scale - 21 Items (DASS-21) was used in the study. The instrument is known to have the capacity to reliably assess the core DAS symptoms. However, under the context of this study, it is important to note that the tool used is not an effective means of diagnosing clinical psychological disorders and is only limited to evaluating the DAS symptoms quantitatively [12]. This study aimed to determine the prevalence of DAS as well as determining how they are associated with and affected by the selected demographics.

II. METHODOLOGY

A. Study Design

A quantitative causal design incorporating a cross-sectional approach was conducted in this study.

B. Respondents

Respondents were determined using stratified sampling. Hence, the respondents were divided into three groups depending on their department, which is Medical Technology, Pharmacy, and Biochemistry. A minimum of 567 respondents were needed to answer the survey in which 329 were from the Department of Medical Technology, 199 from the Department of Pharmacy, and 39 from the Department of Biochemistry. The said number of respondents from each department based on the computation was the minimum number needed. Any number in excess of that was included in the data analysis.

The data used for analysis were that of those who met the inclusion criteria. It included first-year to fourth-year health-allied undergraduate students of the UST under the Pharmacy, Medical Technology, and Biochemistry programs of the Faculty of Pharmacy who were of legal age (18 years old and above) and officially enrolled for the Second Term of Academic Year 2020-2021. Exclusion criteria included all those who do not meet the inclusion criteria. For the withdrawal criteria, the respondents had the freedom to withdraw from the study at any time before, during, and after the entire duration of the study, without penalties nor loss of benefit to which they may otherwise be entitled.

C. Data Collection

Before the data gathering process, the researchers were able to secure the approval of the Ethics Review Committee.

Recruitment of the respondents was done through online means of social networking platforms such as Facebook, Messenger, and Gmail via UST Email to disseminate the survey's Google Forms link and QR code to the respondents. All individuals who saw the post of the study were granted permission to answer the online survey form. As such, the data gathering was entirely by chance because the researchers cannot control the respondents who will answer the survey, making the recruitment process unbiased and randomized. The data gathering procedure was held for around a month; therefore, the QR code and link for the survey form were only available for a certain period. Upon clicking the link or scanning the QR code, the respondents encountered first an informed consent letter in which they have the option whether to be a part of the study or not. Once they agreed to participate in the study, the respondents were directed to the online survey form, which approximately took 10 minutes at most to answer. In this study, the survey was divided into two parts. The first part was made up of questions about the respondents' sociodemographic data, and the second part contained the DASS-21.

D. Data Instrumentation

The instrument used in this study is a modified form of the DASS established by Lovibond and Lovibond [18] that is originally made of 42 items with 14 questions per subscale: depression, anxiety, and stress. However, the modified and shortened version is made up of 21 items in which there are seven questions per subscale [19]. According to the Psychology Foundation of Australia [20], the DASS-21 is anchored toward assessing the severity of the core DAS symptoms in reference to their dimensional conceptions instead of their categorical ones. Moreover, Coker et al. [21] proved that the instrument was proven to possess excellent internal consistency, convergent, discriminative, and concurrent validities. Its subscales for depression and anxiety can be associated with the Self-Rating Depression Scale and the State-Trait Anxiety Inventory.

In measuring the DAS levels of the respondents, subscale scores to be obtained from DASS-21 were summated and multiplied by two (2) in accordance with the DASS manual. These values were then set as the final scores, analyzed with the DASS-21 version of the scale, and categorized into five categories of severity: 'normal', 'mild', 'moderate', 'severe', and 'extremely severe'. For DASS-21-Depression, a score of less than 9 signifies the 'normal' category. A score ranging from 10 to 13 indicates 'mild', 14 to 20 means 'moderate', 21 to 27 is 'severe', and greater than 28 connotes 'extremely severe'. For DASS-21-Anxiety, a score of less than 7 is under the 'normal' category. A score ranging from 8 to 9 means 'mild', 10 to 14 represents 'moderate', 15 to 19 is considered 'severe', and greater than 20 conveys 'extremely severe'. For DASS-21-Stress, a score of less than 14 falls under the 'normal' category. A score ranging from 15 to 18 signifies 'mild', 19 to 25 indicates 'moderate', 26 to 33 belongs to 'severe', and greater than 24 is implied as 'extremely severe' [18, 22].

E. Statistical Analysis

The varying severity categories of the respondents from their DASS-21 results were presented via frequency and percentage distribution. Multiple linear regression, a statistical tool which makes use of two or more independent variables to predict the outcome of one dependent variable, was also conducted to guarantee the significant relationship between the levels of DAS as the dependent variables, and the selected demographics as the independent categorical variables by determining the association using one-way analysis of variance (ANOVA) as well as identifying the relationship between the two variables using regression. By analyzing the gathered data using this statistical technique, changes in levels of DAS upon variations in sex, current residential area, current living status, estimated monthly household income, academic program, and year level were measured. The Statistical Package for the Social Sciences (SPSS) version 26 software, with a level of significance of a p-value less than .05, was used for the entire statistical analysis of the study.

III. RESULTS

A. Prevalence of DAS among Health-Allied Students

Table.1. Frequencies and Percentages of the Respondents under the Severity Categories of DASS-21 Subscale

	Depression	Anxiety	Stress
Normal	354 (53.96%)	272 (41.46%)	550 (83.84%)
Mild	146 (22.26%)	117 (17.84%)	79 (12.04%)
Moderate	147 (22.41%)	193 (29.42%)	27 (4.12%)

Severe	9 (1.37%)	64 (9.76%)	0
Extremely Severe	0	10 (1.52%)	0

n = 656

In the DASS-21 results of the respondents under the depression subscale, more than half of the respondents (53.96%) were under the 'normal' category. The remaining 146 (22.26%), 147 (22.41%), and 9 (1.37%) respondents fell under the 'mild', 'moderate', and 'severe' categories, respectively. Under the anxiety subscale, most of the respondents (41.46%) were under the 'normal' category. Out of the remaining 384 respondents, 117 (17.84%) were under the 'mild' category, 193 (29.42%) were under the 'moderate' category, 64 (9.76%) belonged to the 'severe' category, and 10 (1.52%) fell under the 'extremely severe' category. Under the stress subscale, the majority of the respondents (83.84%) belonged to the 'normal' category. The rest of the 79 and 27 respondents fell under the 'mild' (12.04%) and 'moderate' (4.12%) categories, respectively.

B. *Association between the Selected Demographics and DASS-21 Results of the Health-Allied Students*

Table.2. Association of Selected Demographics on the Depression Level of the Respondents

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.459	7	.351	.672	.696[b]
	Residual	338.568	648	.522		
	Total	341.027	655			

a: Dependent Variable: Depression

b: Predictors: (Constant), Estimated Monthly Household Income, Academic Program, Current Living Status, Sex, Current Residential Area, Year Level

Based on the DASS-21 results of the respondents, this table indicates that depression, which was the dependent variable, was not associated with the selected demographics, such as sex, current residential area, current living status, estimated monthly household income, academic program, and year level. As such, the regression model predicted the dependent variable poorly with a $p = .696$. This means that the regression model was not a good fit for the data.

Table.3. Association of Selected Demographics on the Anxiety Level of the Respondents

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.978	7	1.140	2.698	.009[b]
	Residual	273.748	648	.422		
	Total	281.726	655			

a: Dependent Variable: Anxiety

b: Predictors: (Constant), Estimated Monthly Household Income, Academic Program, Current Living Status, Sex, Current Residential Area, Year Level

Based on the DASS-21 results of the respondents, this table indicates that anxiety, which was the dependent variable, was associated with the selected demographics, such as sex, current residential area, current living status, estimated monthly household income, academic program, and year level. As such, the regression model predicted the dependent variable significantly with a p = .009. This means that the regression model was a good fit for the data.

Table.4. Association of Selected Demographics on the Stress Level of the Respondents

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.693	7	.385	.902	.504[b]
	Residual	276.326	648	.426		
	Total	279.019	655			

a: Dependent Variable: Stress

b: Predictors: (Constant), Estimated Monthly Household Income, Academic Program, Current Living Status, Sex, Current Residential Area, Year Level

Based on the DASS-21 results of the respondents, this table indicates that stress, which is the dependent variable, was not associated with the selected demographics, such as sex, current residential area, current living status, estimated monthly household income, academic program, and year level. As such, the regression model predicted the dependent variable poorly with a p = .504. This means that the regression model was not a good fit for the data.

C. Effect of the Selected Demographics on the Dass-21 Results of the Health-Allied Students

Table.5. Effect of Selected Demographics on the Anxiety Level of the Respondents

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.903	.520		1.738	.083
	Sex	.180	.060	.118	3.022	.003
	Academic Program	-.015	.044	-.013	-.355	.738
	Year Level	-.101	.039	-.136	-2.606	.009
	Current Residential Area	-.024	.052	-.018	-.456	.648
	Current Living Status	.123	.248	.019	.495	.621
	Estimated Monthly Household Income	-.003	.025	-.005	-.136	.891

a: Dependent Variable: Anxiety

This table displays the selected demographics, such as sex, current residential area, current living status, estimated monthly household income, academic program, and year level had a significant effect on the anxiety level of the respondents based on their DASS-21 results. Among the selected demographics, the data showed that only the sex and year level were statistically significant to the model with a p = .003 and p = .009, respectively. The regression equations for the significant results are as follows:

Anxiety=0.903 + 0.180 (sex)

Anxiety= 0.903 – 0.101 (year level)

This means that sex increased the anxiety level, but it was not identified if it was male or female that specifically affected the anxiety levels. For the year level, as the year level of the respondents increased, their anxiety level decreased. The other selected demographic variables had no significant effect on anxiety with a p > .05.

IV. Discussion

The researchers were able to obtain a total of 656 respondents from the survey. The DASS-21 results of the respondents, particularly their final scores in each subscale (depression, anxiety, and stress), were analyzed and categorized into five categories of severity: ‘normal’, ‘mild’, ‘moderate’, ‘severe’, and ‘extremely severe’. Scores under ‘normal’ and ‘mild’ categories were classified as ‘psychologically normal’, while scores under ‘moderate’, ‘severe’, and ‘extremely severe’ were classified as ‘psychologically distressed’. Out of the three subscales, relatively, stress was the least concerning in terms of raw case severity as 629 respondents (95.98%) were classified as ‘psychologically normal’ albeit the remaining 27 respondents (4.12%) belonged to the ‘moderate’ category, classifying it as ‘psychologically distressed’. The depression subscale showed a similar pattern to the stress category, with the only difference being that there was a lesser number of respondents, specifically 500 (76.22%), falling under the ‘psychologically normal’ classification while the rest of the 126 respondents (23.78%) were classified as ‘psychologically distressed’. The anxiety subscale was relatively the most concerning out of all the three subscales as almost half of the respondents, in particular, 267 of them (40.70%), were classified as ‘psychologically distressed’ whereas the remaining 389 respondents (59.30%) were classified as ‘psychologically normal’.

The researchers’ finding on the prevalence of anxiety was higher than the study conducted by Samreen et al. [23] in Saudi Arabia. Results showed that the prevalence of anxiety was 22.9% among 170 pharmacy students. The present finding was also higher than the study conducted by Tee et al. [24] regarding

the mental impact of the COVID-19 pandemic in the Philippines. It showed that the prevalence of anxiety was 28.8% of the sample (n = 1879) of the general population. Another local study on adult Filipinos from low-income communities (n = 1, 203) using the Hospital Anxiety and Depression Scale showed a relatively higher prevalence of anxiety, which was 39% but a percent lower than the researchers' findings [25]. In the United States, a study on various medical schools using the 7-item Generalized Anxiety Disorder assessing anxiety of medical students (n = 1428) resulted in a prevalence of 30.6% [26]. A study conducted among pharmacy students (n = 164) in Alexandria University in Egypt using the Beck Anxiety Inventory showed a 29.3% prevalence of anxiety [27]. However, the same study showed a higher prevalence of anxiety (43.9%) in medical students, which was higher than the researchers' findings.

A higher prevalence of anxiety was noticeable among medical students. A study in Nepal by Pokhrel et al. [28] among medical students and residents showed a 45.3% prevalence of anxiety using the Hospital Anxiety and Depression Scale. A higher prevalence of anxiety was evident among the same type of students in the findings of Iqbal et al. [5] in India and Fawzy and Hamed [29] in Egypt, which were 66.9% and 73%, respectively. Possible reasons for a higher prevalence of anxiety among medical students could be due to the competitive environment, continuous assessment, and undue self-criticism [27]. In addition, a high prevalence of anxiety was noticeable as well in a recent study by Fauzi et al. [30] in Malaysia among students taking up health sciences programs such as Nursing, Medical Laboratory Sciences, and Medical Imaging. Results showed that the respondents (n = 449) had a prevalence of anxiety of 85.1%. The varying prevalence of anxiety across countries could be attributed to the differences in the methodology applied, such as research design, sampling method and size, and data instrumentation when a particular study was conducted [23, 30, 31]. Moreover, anxiety could also be due to various risk factors such as drug addiction, genetics, academic pressure, sleep adequacy, and demographics [28, 29, 32, 33].

In this study, the researchers intended to determine the association of selected demographics such as sex, current residential area (within Metro Manila or outside Metro Manila), current living status (with or without a companion), estimated monthly household income, academic program, and year level on the DAS levels of the health-allied students of the UST Faculty of Pharmacy. Additionally, they also wanted to determine which of those demographics affected their DAS levels. Therefore, multiple linear regression was used as a statistical tool for data analysis to determine the association and causality between the respondents' selected demographics and DAS levels. Specifically, under the multiple linear regression, ANOVA was utilized to determine the association between the selected demographics and DAS levels. Regression was additionally used to determine which selected demographics affect the DAS levels of the respondents.

Only anxiety showed significant association ($p = .009$) with the selected demographics out of all three subscales of DASS-21. The significant association with anxiety is in accordance with studies in Saudi Arabia conducted by Samreen et al. [23] on pharmacy students and AlShamlan et al. [34] on medical students despite the difference in data instrumentation used. Moreover, the present finding using the same data instrumentation in this study (DASS-21) aligns with Fauzi et al. [30]. In particular, they conducted a study on the DAS levels' prevalence and risk factors among health sciences or health-allied undergraduates, particularly those who are taking Medical Laboratory Sciences, Nursing, and Medical Imaging in Malaysia. Additional studies consisting of health professions students conducted by Sahu and Nayak [35] and Ekanayaka and Rathnayake [36] reported a significant association of sociodemographics on anxiety as well. Similar results are in line with related literature that had medical students as respondents [12, 13, 37]. However, the researchers' findings on the insignificance association of selected demographics on depression and stress were contradictory to such studies.

There were studies claiming insignificance of sociodemographics, particularly sex and year level, on anxiety. Studies conducted among nursing students in Hong Kong [38] and Sri Lanka [36] showed that sex and year level did not significantly affect DAS. Consistently, studies conducted among medical students in Bangladesh [39], India [16], Nepal [40], and Palestine [41] assessing DAS symptoms showed that sex had an insignificant effect or association on anxiety. This was also evident in the studies conducted in Bangladesh on university students [42], India on medical and engineering students [43], and Malaysia on health sciences undergraduates [30]. In addition, studies of Kunwar et al. [40] and Fauzi et al. [30] noted insignificance in year level as well. Thus, despite related literature claiming insignificance of sex and year level on anxiety, the researchers' findings claimed otherwise. As for sex, results showed that sex had a $p = .003$ upon using regression, indicating that it significantly affected anxiety. This

finding was in accordance with several studies worldwide [5, 12, 13, 24, 25, 27, 28, 34, 37, 44-48].

In the Philippines, studies were conducted on the DAS levels of adult Filipinos for specific reasons, such as examining the prevalence of psychological distress among low-income communities [24] or assessing the mental impact of the COVID-19 pandemic [25]. Despite the reasons for conducting the study, both studies showed higher anxiety levels in females than males. In addition, such findings were also evident in studies among college students in Saudi Arabia [47] and China [45]. It was observed that females had higher anxiety levels while males had higher depression levels [45]. Furthermore, a similar finding was also observed among medical students across the globe like in Egypt [13, 27], Ethiopia [37, 46], India [5], Nepal [28], Saudi Arabia [34], and Syria [12]. In addition, anxiety among female medical students had a rate of twice that of males [46, 49]. Another study was conducted by Macauley et al. [50] on the anxiety of health professions students, particularly those who are taking Master of Science in Communication Science Disorders, Master of Physician Assistant Studies, and Doctor of Physical Therapy using the Westside Test Anxiety Scale and the State-Trait Anxiety Inventory. In terms of sex, results showed that females displayed higher mean anxiety levels than males.

Higher levels of anxiety in females may imply that they are more vulnerable to anxiety disorders than males [51]. Amir and El Gellany [52] and Ibrahim and Abdelreheem [27] also observed that they might be more susceptible to psychological symptoms. Jalnapurkar et al. [53] conducted a review on anxiety disorders regarding sex differences. They concluded that the probability of developing anxiety disorders, namely general anxiety disorder, panic disorder, and social anxiety disorder, were more likely in females than in males. Moreover, such disorders are more complicated with comorbidities such as drug use disorders, mood disorders, and somatoform disorders [54-57]. Anxiety disorders with comorbidities present a long-term clinical course and exhibit more severity in symptoms, which show an increased risk for suicide [57-61].

Based on the literature mentioned above, there seems to be a consensus that females had higher anxiety levels than males. However, it is to be noted that the researchers' findings only determined the significance of sex affecting anxiety, but not which sex specifically affected it. Higher levels of anxiety in females may be due to cultural, environmental, social, or biological factors [53, 62]. According to the Anxiety & Depression Association of America [63], there were hormonal and biochemical distinctions between males and females in which estrogen and progesterone are responsible for more prolonged and easy activation of the fight-or-flight response among females. Moreso, periodic shifts in female hormones occurring throughout their lifespan may influence the anxiety disorders' severity and clinical course [64]. Additionally, females were also more vocal in expressing their dissatisfaction with the heavy academic workload and reporting their psychological and somatic symptoms [52, 65-67]. Furthermore, males tend to be reticent on their psychological concerns [68]. Additional reasons could be attributed to traditional gender norms, fewer job opportunities, and increased exposure to acute stressors [46, 52].

Another finding of this study was the significant effect of the year level on anxiety ($p = .009$). It was further explained by the regression equation that there is an inverse relationship between the anxiety level of the respondents and their year level, wherein their anxiety level decreases as their year level increases. Such finding was congruent with various studies across the globe [12, 28, 31, 34, 37, 45-47, 50, 69-71]. Aside from the significance of sex on anxiety, another finding of Gao et al. [45] among Chinese college students showed that students were suffering from mild anxiety during their first three years of college, particularly females in their first and second years. They concluded that there was a correlation between introversion and first-year students. Similarly, Khoshaim et al. [47], in their study among university students in Saudi Arabia, reported that fourth-year students have higher anxiety levels than fifth-year students. They concluded that fifth-year students have less anxiety in this online setting because classes were already in the last semester, and students were in their "cooperative training program". Hence, their academic standing was not heavily influenced by the online mode of learning.

Consistent with the downward trend of anxiety on year level, a similar finding was found among medical students in Brazil [70, 71], Ethiopia [31, 37, 46], and Nepal [28]. Those aforementioned studies observed that first-year medical students had the highest anxiety level than other years, which could be attributed to the overwhelming curriculum and adjusting to a new environment [28, 46]. Additionally, a study in Pakistan using the Beck Anxiety Inventory to assess anxiety showed that second-year medical students had higher anxiety than third-year and fourth-year medical students [69]. A study by AlShamlan et al. [34] in Saudi Arabia regarding the association of anxiety and future specialty preparation among

fourth-, fifth-, and sixth-year medical students in their clinical years showed that fourth-year students had the most anxiety level due to lack of exposure to most specialties. A lesser anxiety level of medical students in higher academic years might be attributed to their gradual adaptation to academic stress in which they developed skills not just in managing it but as well as being able to manage their time [12, 69, 72, 73].

Contrary to the downward trend, other studies have reported an upward trend of anxiety on year level. Mofatteh et al. [74] investigated risk factors associated with DAS among university students by evaluating various articles from the year 2000 to 2020. Based on the studies of Lee et al. [75] and Ratanasiripong et al. [76], they concluded that students in their final years suffered a tremendous amount of anxiety due to uncertainties about the future like employment status, adjustment from student life to real life, and repaying university debt. Similarly, Macauley et al. [50] observed among Doctor of Physical Therapy students that second-year students had significantly higher anxiety scores than first-year students, which might be due to the stress they were experiencing in shifting to clinical training [77]. Likewise, senior medical students showed the highest anxiety level among other year levels in the studies of Aktekin et al. [78] in Turkey and Liu et al. [79] in China. Such finding is mainly due to the pressure they were facing, such as graduation, future employment, and financial concerns [79]. The variances in the findings regarding the relationship between anxiety and academic year level may be attributed to the differences worldwide in educational methods such as curricula and teaching styles [12].

Overall, based on the researchers' significant findings and the related literature presented above, anxiety is a serious mental health concern worldwide, especially for medical and health-allied students. Excessive anxiety levels can be detrimental to one's quality of life since they can lead to adverse impacts. For example, it can damage relationships, diminish academic performance, higher likelihood of suicidal tendencies, impair cognitive function, and reduce work ability [46, 61, 80]. Moreover, the rise in the prevalence of anxiety disorders has shown an association with the increased mortality and morbidity rate globally [81]. Hence, there is a need to address the issue. Jadoon et al. [82] suggested adjusting the learning environment in accordance with different phases in a particular program; disseminating information regarding active coping strategies; encouraging students to seek help and dedicate time for their personal lives as well; and providing recreational resources at campus and interventions to address students' problems. Furthermore, the knowledge on which selected demographics significantly influence anxiety may help psychology-related sectors or institutions to know which areas to focus on to provide proper counseling and appropriate interventions.

As mentioned earlier, the results exhibited no statistically significant effect in depression and stress levels between male and female students. These coincided with studies having similar objectives but used different quantitative instruments to describe DAS levels of students [45, 83]. However, previous reports of Abdel Wahed and Hassan [13] demonstrated that females experienced greater vulnerability to stress than males and generally obtained higher anxiety and stress scores in DASS-21. Mirza et al. [48] also revealed a higher prevalence of depression in females than males using several peer-reviewed publications. The report is contradictory to a study conducted in mainland China where male students had a greater predominance of depression, for they were less likely to use mental health assistance in their communities [84].

In addition, selected demographics that obtained significant levels of p-value more than .05, such as academic program, current residential area, current living status, and estimated monthly household income, did not significantly affect the DAS levels of health-allied students. A study conducted by Sahu and Nayak [35] at the University of the West Indies statistically revealed that veterinary, dental, medical, and pharmacy students did not exhibit significant differences in depression and anxiety scores using DASS-21. Preceding reports did not also identify any significant association between residential area, current living status, and monthly household income to the mental condition of students. Health-allied students deal with a similar extent of DAS regardless of their parents' monthly earnings, with whom they were staying, and residency status (e.g., urban, suburban, or rural) [26, 36, 42, 85]. These findings were opposed to the cross-sectional study of Abdel Wahed and Hassan [13], which states that poor socioeconomic and residency conditions due to household financial difficulties greatly influence the psychological distress of medical students.

To sum it up, these inconsistent data reports about the influence of different sociodemographics concerning the occurrence of DAS among health-allied students were seemingly involved with variability in research design, data collection tools, biological factors, and socio-cultural settings of different cited literature. Despite the variances in data findings, the related reports mainly revealed alarming rates of psychological distress

among university or college students, particularly those who are taking medical and health-allied programs [27, 78]. As mental condition largely contributes to the ability of man to be mentally, emotionally, and socially competent, students' mental health concerns should be prioritized and effectively addressed by close social groups such as family and friends, educational institutions, and national health organizations.

Furthermore, health-allied students generally belong in the late adolescent age bracket that is in great need of social support and guidance as they progress towards adulthood while experiencing academic challenges [89]. According to Estrada et al. [87], in the Philippines, the prevalence of mental health issues among Filipino children and adolescents is high and continuously increasing. However, the use of mental health assistance is generally low. Stigmatization and negative attitudes towards mental health problems, lack of awareness, and inaccessibility to affordable mental health services were the identified major constraints that hinder young adults from seeking professional help. This finding was congruent to the systemic review of Martinez et al. [88] in the similar country, which states that these constraints cause psychologically suffering individuals to rely on themselves and cope with mental health problems in secret.

In the light of the results of this study and the determined constraints in mental health help-seeking of young adults in the Philippines, national health organizations are suggested to revisit and reform the previous mental health act (Republic Act no. 11036 or the Philippine Mental Health Act) in accordance with the current situation of mental healthcare in the country. An effective national framework must be established to provide quality yet affordable mental health services with expanded accessibility. Being considered as parents in academe, administrative officers and educators of academic institutions should help expand mental health awareness and prevent the prevalence of psychological distress among students. Collaborative effort and actions from family members or guardians and academic institutions are also advised. Regular counseling, annual physical examination with a mental checkup, and inclusion of mental health education in the general curriculum of college students can be implemented to build a holistic approach and social support systems.

Failure to determine, address and resolve the factors affecting the mental health condition or the general problems of mental healthcare in the Philippines are expected to result in increased severity of psychological distress and poor quality of life among students [89]. Unaddressed mental health concerns most likely progress to chronic illnesses such as bipolar disorder and major depressive disorder. Different studies of Esang and Ahmed [90] and Sher [91] have shown that adolescents with untreated mental problems resort to drug or alcohol abuse, violent acts, intentional self-harm, or suicide.

V. Conclusion And Recommendation

The results of this study reveal that out of the three dependent variables of the study, anxiety is found to be the most prevalent psychological distress among health-allied students. Moreover, it is also the only variable that is significantly associated with the selected demographics, particularly being affected by sex and year level. Sex is determined to significantly affect the anxiety level of health-allied students, but it is not identified which sex specifically affected their anxiety levels. Year level also significantly affects the anxiety level of health-allied students in which as their anxiety, level decreases while their year level increases. Based on the results of this study and the supporting related literature, anxiety is a serious mental health concern worldwide, especially for medical and health-allied students. Excessive levels of anxiety can have detrimental effects on one's quality of life. Hence, it should be addressed, and appropriate solutions should be implemented.

Additionally, the remaining sociodemographics in this study show insignificant association with the DAS levels of respondents, which is both substantiated and disproved by various gathered literature. Discrepancies may be attributed to the differences in research methodology, biological factors, and sociocultural settings. Despite such variances, one thing remains consistent: the alarming rates of psychological distress among university students, particularly health-allied and medical students. The findings of this study could lead to a better understanding of what truly affects the DAS levels of health-allied undergraduate students. Therefore, future studies should be pursued as these benefit students and encourage collaborative effort and actions from family members or guardians and academic institutions to tackle mental health problems. Furthermore, the study may be administered to aid future endeavors akin to selected demographics as factors affecting DAS levels that are related but not limited to health-allied students.

The researchers suggest that future related studies expand the scope of respondents. The line of study can be improved if selected respondents from various universities who are taking up health-allied courses will be included. This is to provide

more reliability and accuracy to the data as well as avoid having a limited number of respondents, which will restrict its generalizability. In addition, a larger scope of respondents will affect their demographics and allow for a more accurate representation of the target population.

Furthermore, since one of the notable findings in the study consists of the significant effect of sex on the anxiety levels of the respondents, the researchers also suggest determining which sex specifically affects anxiety levels more. This will yield more accurate information regarding whether or not the aforementioned selected demographic has a significant effect on the said variable or not. Moreover, since both sex and year level reveal to have a significant effect on the anxiety levels of the respondents in this study, a more in-depth analysis of the said factors may also be elaborated in future studies.

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