www.ijses.net

Association of Extracurricular Activities on Academic Stress of Medical Students: A Cross-sectional Study

Hannah Abigail A. Gruyal
University of the East Ramon Magsaysay, Philippines

Patricia Elisse I. Madiam
University of the East Ramon Magsaysay, Philippines

Michellie Anne O. Gregorio
University of the East Ramon Magsaysay, Philippines

Marie Elizabeth H. Magsombol
University of the East Ramon Magsaysay, Philippines

Alyszea Andria O. Guanzon
University of the East Ramon Magsaysay, Philippines

Ma. Therese Lafayette H. Magtibay
University of the East Ramon Magsaysay, Philippines

To cite this article:

Gruyal, H. A. A., Madiam, P. E. I., Gregorio, M. A. O., Magsombol, M. E. H., Guanzon, A. A. O., & Magtibay, T. L. H. (2020). Association of Extracurricular Activities on Academic Stress of Medical Students: A Cross-sectional Study. *International Journal of Studies in Education and Science (IJSES), 1*(2), 92-111.

International Journal of Studies in Education and Science (IJSES) is affiliated with the
International Society for Technology, Education, and Science (ISTES): www.istes.org

IJSES International Journal of Studies in Education and Science
2020, Vol. 1, No. 2, 92-111 ISSN: 2767-9799

Association of Extracurricular Activities on Academic Stress of Medical Students: A Cross-sectional Study

Hannah Abigail A. Gruyal, Patricia Elisse I. Madiam, Michellie Anne O. Gregorio, Marie Elizabeth H. Magsombol, Alyszea Andria O. Guanzon, Ma. Therese Lafayette H. Magtibay

Abstract

Medical school is perceived as a stressful environment; thus, students engage in extracurricular activities such as physical exercise or join organizations to help cope with stress. This study investigated the association between engagement in extracurricular activities and academic stress of medical students at a university. The study utilized an analytical cross-sectional approach, wherein stress of medical students was measured using the academic stress subscale of the Student Stress Inventory Questionnaire (SSIQ), and their extracurricular activities were noted. A total sample of 697 participants was enrolled. Data were collected through self-administered questionnaires which were distributed to the randomly selected students. Data obtained were analyzed using prevalence odds ratio, Pearson's chi-square test and ordinal logistic regression. The results showed that non-participation in extracurricular activities, female students and second- and third-year students are positively associated with academic stress. It was also found out that hours spent on extracurricular activities had varied negative and lack of association with academic stress. Lastly, as the number of extracurricular activities increased to 4, a low positive association with academic stress is noted. Thus, participation in extracurricular activities may be a coping mechanism in handling academic stress among medical students.

Keywords: Extracurricular activities, Academic stress, Medical students

Introduction

The issue of the health and well-being of medical students has become an increasing research interest in recent years (Bergmann et al., 2019). Development of mental health problems - such as depression and anxiety - has been one of the leading topics related to medical students' well-being (Brenneisen et al., 2016; Hope and Henderson, 2014; Silva et al. 2017). Based on the available literature, the common denominator of these mental problems points to the constant exposure to stress among medical students (Abdulghani et al., 2011; Anuradha et al., 2017; Garg et al., 2017). It is common knowledge that medical school itself is an all-prevailing pressure situation, where grueling academic demands compounded by an overwhelming lack of time are prime factors in the development of stress among students (Abdulghani et al., 2011; Alsulami et al., 2018). The environment

itself provides an authoritarian and rigid system that encourages competition rather than cooperation between students, possibly contributing to more stress (Abdulghani et al., 2011).

Stress is defined as the body's non-specific response to an environment that is perceived as threatening or a threat to well-being; and it directly upsets the individual, both mentally and physically (Yusoff et al., 2010; Salam et al., 2013). Stress experienced among medical students vary depending on circumstances — the year level the medical students are in (Garg et al., 2017; Dyrbye et al., 2006), gender, lack of family support and personal history of depressive disorder (Baldassin et al. 2008). Moreover, medical students perceive the same stressors differently due to the difference in their cultural backgrounds, personal traits, experience, and coping skills (Yusoff et al., 2010). Aside from the perceived stress with sociodemographic characteristics, stressors can generally be grouped into academic, psychosocial, and environmental stressors (Anuradha et al., 2017), with academic stress considered as the greatest obstacle in medical students' overall academic performance (Alsulami et al., 2018).

It has been suggested by Linn and Zeppa (1984) that some stress in medical school is needed for learning, which is called 'favorable stress.' However, chronic exposure to high levels of stress or distress can bear negative effects on a person's well-being, including intrapersonal conflicts (such as low self-esteem and feelings of dissatisfaction), mood swings, sleeping disorders and mental health disorders such as depression and anxiety, in which the latter are at high prevalence in a medical school (Brenneisen et al., 2016; Dahlin et al., 2005; Jadoon et al., 2010; Salam et al. 2013; Yusoff et al. 2010). This can have a domino effect on students' motivation, thus posing a higher risk on having academic-related or work-related problems, thus, bearing a chance of long-term negative effects on students' educational and career goals (Chen et al., 2013; Ruzhenkova et al., 2018).

With the constant exposure to high stress among medical students, each student develops a unique coping strategy to balance out the stress being experienced. A common strategy employed by medical students is to join extracurricular activities, which was the focus of this study. It was suggested by Chan (2016) that extracurricular activities play a key role in the education of an individual. Additionally, Eccles et al. (2003) and Stuart et al. (2011) showed that these activities may enhance several skills such as problem-solving, analytical, and critical-thinking skills through hands-on experience and collaborative activities. Hence, these activities are widely accepted among students as stress relievers. Engagement with these activities has proved to reduce stress levels and anxiety and, more than that, can lead to positive outcomes such as improvement on mental (and physical) health, enhancement of social skills and reinforcement of healthier stress-coping techniques within and beyond the classroom (Fares et al., 2016).

A few international studies have already noted ideal outcomes with participation in extracurricular activities, such as improvement on medical students' health and well-being. However, there are limited studies about the effects of extracurricular activities on academic stress among medical students in the local setting. Thus, this study was done in hopes of determining an association between extracurricular activities and academic stress experienced by medical students locally, and to discern the importance of joining these extracurricular activities as a possible mitigator of academic stress experienced by these medical students.

Method

Study Design

An analytical cross section method was employed to attain the objectives of this study. The independent variable was the engagement of the student in extracurricular activities, while the dependent variable was the perception of academic stress.

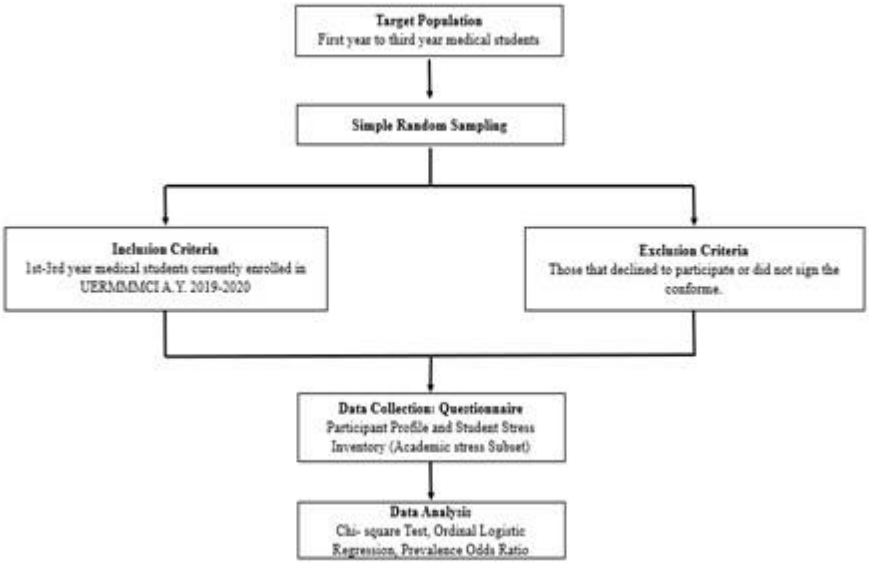

Figure 1. Schematic Flow of the Study

Sample Population

The sample population is composed of first year, second year and third year students at the University of the East Ramon Magsaysay Memorial Medical Center, Inc. (UERMMMCI) – College of Medicine, Philippines, enrolled during the Academic Year 2019-2020. In contrast, the study excluded students who declined to participate or did not sign the Informed Consent form.

The minimum required sample size was set at 649 based on a confidence interval of 95%, a power of 90%, and a proportion of 61.8% derived from the study of Fares et al. (2016) depicting the proportion of students experiencing stress in association with extracurricular activities. From the formula, it was computed that the respondents needed for this study was 1,695. However, the student population of first to third year medical students only has a population of 1,050 and does not accommodate the required sample size. To be able to still have an accurate representation of the population, the formula for finite population was used.

In total, 649 participants were needed in the completion of this study. Simple random sampling was employed in participant selection.

Operational Definition

For this study, *extracurricular activities* were defined as activities which are not part of the academic curriculum. Extracurricular activities in this study are limited to sports, music, arts, and others. The *level of involvement in extracurricular activities* (or *time commitment*) was defined as the number of hours spent in extracurricular activities, with reference to the data obtained from the utilized demographics questionnaire. *Academic stress* was defined as the difficulty in handling and performing academic activities as defined by the academic sub-scale of the Student Stress Inventory questionnaire with scores 10-19 (mild), 20-30 (moderate), and 31-40 (severe), respectively.

Data Collection

Informed Consent

Prior to data collection and included in the questionnaires that were distributed, an informed consent form was given to the participants in which they were asked to sign if they were willing to participate in the study. The contents were read and explained to them by the researchers to ensure their understanding of the nature of the study, its benefits, and risks. Data collection was through a self-administered questionnaire.

Data Collection Tool

The questionnaire used for the study consists of four pages. The first two pages were informed consent. The third page of the instrument collected information on the participants' demographics and questions on their extracurricular activities. This measured the involvement in extracurricular activities by giving a set of questions that would present the activities performed by the students (Arip et al., 2016). Specifically, the questions asked were whether they engage in extracurricular activities, the number of activities they engage in, and the average number of hours that they spend on these extracurricular engagements per week (Kelly, 2012) (see Figure 2).

The fourth page of the questionnaire consisted of questions on their level of academic stress. The Student Stress Inventory (SSI) was used to measure the level of stress of the participants. This was a measure that was developed by Arip et. al. (2016) to measure the stress levels of university students. It was divided into four subscales that consist of ten items each, making the SSI a total of 40 items. These four subscales include: Physical, Interpersonal Relationship, Academic, and Environmental Factor. For the purposes of this study, only the third subscale, Academic (see Figure 3), was used to assess the stress of medical students.

The SSI scale was proven to be both valid and reliable. The validity of the academic sub-scales was reviewed by nine experts in the fields of education and counseling. All items in the subscales were accepted and given a validity rating of 82.2%. The SSI was also proven to be reliable with a reliability value of 0.842. This measure made use of a 4-point Likert scale with a score of 1 being "Never", a score of 2 being "Somewhat frequent", a score of 3 being "Frequent", and a score of 4 being "Always".

Please circle your answers.

(a) Gender: Male Female

(b) Year of school: 3rd year 6th year

(c) Do you participate in an extracurricular activity (either in or outside of school)?

Yes No

If you answered yes to question (c) continue answering questions (d) to (h)
If you answered no please move on to page 3.

(d) How many extracurricular activities to you participate in?

1 2 3 4 5 or more

(e) Name your main extracurricular activity - _____

(f) What form of extracurricular activities do you participate in?

Sport Music Arts (dance/theatre) Other

(g) How many hours of the week would you be involved in these extracurricular activities (roughly)?

1-3 hours 3-6 hours 6-9 hours 9-12 hours More than 12 hours

Figure 2. Demographic Questionnaire (Kelly, 2012)

No	Item	N	SF	F	A
21	I have a financial problem because of the expenses of the university	1	2	3	4
22	I find difficult to juggle time between study and social activity	1	2	3	4
23	I feel nervous delivering the class presentation	1	2	3	4
24	I feel stressed as submission deadline neared	1	2	3	4
25	I feel stressed to sit for examination	1	2	3	4
26	I find difficult to juggle time between study and society involvement	1	2	3	4
27	I loss interest towards courses	1	2	3	4
28	I feel burden of academic workloads	1	2	3	4
29	I feel stressed dealing with difficult subject	1	2	3	4
30	I feel difficult in handling my academic problem	1	2	3	4

Figure 3. Academic Subscale (Arip et al., 2016)

As for interpretation, the SSI had provided a range of scores that would indicate whether the participant exhibited a mild, moderate, or severe level of stress, and the researchers' consequent interpretation for each type (see Figure 3). Participants whose total score fell under 10-19 were considered mildly stressed; those whose total score fell under 20-30 were considered moderately stressed; and those whose total score fell under 31-40 were considered severely stressed.

Data Collection Procedure

Lists of the names of students from all sections of first to third year levels enrolled in UERMMMCI for the school year 2019-2020 were obtained. From these lists, names were randomly chosen via generation of random numbers to become participants. These self-administered questionnaires were then distributed to the participants. The data collection period was from August to September 2019. To ensure maximal response rate, a surplus of questionnaires was given out. A total of 783 questionnaires were distributed in which 697 were completed with an 89.02% response rate.

Data Analysis

For analysis, those who fell under mild stress were considered as "not stressed" while moderate and severe stress were clustered and considered as "academically stressed". For the analysis of number of hours (time commitment) and extracurricular activity count, the baseline of comparison considered was those who did not engage in any extracurricular activities. Lastly, for the analysis of academic stress among year levels, the baseline of comparison was those in first year. Gathered data were compiled in Microsoft Excel and data analyses were run using SPSS version (v. 20) for chi-square and R 3.3.2 for the logistic regression. These would consist of the following: A *Chi-Square Test* was used to determine the significance of the results on the association between in extra-curricular activities and academic stress. A confidence interval of 95% and a p-value of <0.05 was used to determine overall significance. *Prevalence odds ratio* was used in the analysis of association between participation in extracurricular activities and academic stress. *Logistic regression* was also utilized to determine the likelihood of acquiring academic stress accounting for all other variables such as gender, year level, hours of involvement in extracurricular activities as well as the number of extracurricular activities using *Ordinal Logistic Regression Model*. A confidence interval of 95% was used with a p-value of 0.05 to determine significance.

Results

Gender

Participants' demographics are shown on Table 1 and 2. Table 1 shows the frequency of male and female respondents. There were more female (n=467, 67%) than male respondents (n=230, 33%) attributed to the higher population of female medical students enrolled in the institution.

Table 1. Frequency Distribution of Gender among Respondents (n=697)

Variable: *Gender*	**N**	**% Distribution**
Male	230	33%
Female	467	67%

Involvement in Extracurriculars

Student involvement in extracurricular activities, number of activities and time commitment are summarized on Table 2. From the data gathered, most of the medical students in the institution (n=397, 56.96%) were involved in extracurricular activities. Most of these students had one extracurricular activity (n=181, 25.97%), mostly spending their time on these activities for 1-3 hours (n=211, 30.27%).

Table 2. Frequency Distribution of Demographic Variables (n=697)

Variable	N	% Distribution
Participation on Extracurricular Activity		
No	300	43.04%
Yes	397	56.96%
Number of Extracurricular Activity		
0	300	43.04%
1	181	25. 97
2	120	17.22%
3	68	9.76%
4	15	2.15%
5 or more	13	1.87%
Hours Spent on Extracurricular Activity		
0 hour	300	43.04%
1-3 hours	211	30.27%
3-6 hours	118	16.93%
6-9 hours	49	7.03%
9-12 hours	12	1.72%
More than 12 hours	7	1%
Academic Stress Level		
Mild	155	22.24%
Moderate	490	70.30%
Severe	52	7.46%

When considering the amount of stress medical students experienced (regardless of their participation in extracurricular activities) it was found that most were moderately stressed academically (n=490, 70.30%), followed by mildly stressed (n=155, 22.24%), and severely stressed was the least reported (n=52, 7.46%).

Association between Different Variables

The data presented on Tables 3 to 6 include analysis on the following variables – participation and non-participation in extracurricular activities (see Table 3), gender (see Table 4), and year levels (see Tables 5-6) – in relation to stress. Non-participation in extracurricular activities showed a significant positive association with academic stress, with a prevalence odds ratio of 1.447 (95% CI: 1.001, 2.093, p-value: 0.048) as shown in Table 3.

Table 3. Association of Extracurricular Activities and Stress

	Stressed	Not Stressed	POR	95% CI	p-value
Without Extracurricular Activities	244	56	1.447	(1.001, 2.093)	0.048
With Extracurricular Activities	298	99			

Moderately and severely stressed data were collectively clustered as "stressed", while data on mild stress were grouped as "not-stressed."

As shown in Table 4, compared to males, females showed a positive association with academic stress, with a prevalence odds ratio of 1.382 (95% CI: 0.954, 2.002, p-value: 0.086), however, this was statistically non-significant.

Table 4. Association of Gender and Stress

	Stressed	Not Stressed	POR	95% CI	p-value
Female	372	95	1.382	(0.954, 2.002)	0.086
Male	170	60			

Moderately and severely stressed data were collectively clustered as "stressed", while data on mild stress were grouped as "not-stressed."

For the year-level variability, the second-year students also yielded to a non-significant but strong positive association with academic stress, with a prevalence odds ratio of 1.481 (95% CI: 0.969, 2.261, p-value: 0.068), as shown in Table 5.

Table 5. Association of Year Levels (1st year vs 2nd year) and Stress

	Stressed	Not Stressed	POR	95% CI	p-value
2nd year	208	53	1.481	(0.969, 2.261)	0.068
1st year	159	60			

Moderately and severely stressed data were collectively clustered as "stressed", while data on mild stress were grouped as "not-stressed."

Lastly, as shown in Table 6, third-year students showed a significant strong positive association with academic stress, with prevalence odds ratio of 1.572 (95% CI: 1.003, 2.463, p-value: 0.047).

Table 6. Association of Year Levels (1st year vs 3rd year) and Stress

	Stressed	Not Stressed	POR	95% CI	p-value
3rd year	175	42	1.572	(1.003, 2.463)	0.047
1st year	159	60			

Moderately and severely stressed data were collectively clustered as "stressed", while data on mild stress were grouped as "not-stressed."

Ordinal Logistic Regression Analyses

Further analyses using ordinal logistic regression were done to assess the association and outcome between each variable (see Table 7). Firstly, females had, again, a non-significant but positive association with academic stress (OR=1.406, 95% CI: 0.99, 1.99, p-value: 0.054). Secondly, for the year-level variability – with reference to the first years as the baseline comparison – second year students had a stronger significant positive association with academic stress (OR=1.586, 95% CI: 1.06, 2.37, p-value: 0.024) more than the third years. As per the number of extracurricular activities, results showed consistently negative associations for counts below 4; however, as soon as the number of extracurricular activities students were involved in increased to 4 counts, a non-significant, but low positive association (OR= 1.27, 95% CI: 0.03, 44.18, p-value: 0.090) was reported. Lastly, for the time commitment variable, each range (for the number of hours spent) had a negative and lack of association with academic stress. The results for the students' time commitment were also non-significant.

Table 7. Ordinal Logistic Regression Outcome on Study Variables

	OR	**95% CI**	**p-value**
Gender (Baseline: Male)			
Female	1.406	(0.99, 1.99)	0.054
Year (Baseline: 1st year)			
2nd	1.586	(1.06, 2.37)	0.024*
3rd	1.494	(0.99, 2.27)	0.059
Participation (Baseline: No)			
Yes	1.055	(0.18, 7.49)	0.955
Hours (Baseline: 0 hours)			
1-3 hours	0.798	(0.05, 13.41)	0.877
3-6 hours	0.715	(0.04, 12.34)	0.819
6-9 hours	0.558	(0.03, 9.95)	0.694
9-12 hours	1.173	(0.05, 26.34)	0.920
More than 12 hours	0.634	(0.03, 16.48)	0.784
Count (Baseline: 0)			
1	0.778	(0.03, 22.30)	0.885
2	0.756	(0.02, 21.40)	0.872
3	0.695	(0.02, 20.46)	0.835
4	1.271	(0.03, 44.18)	0.896
5 or more	0.519	(0.01, 18.23)	0.722

**Significant at 0.05*

Discussion

Medical students experience a compelling amount of stress daily. Linn and Zeppa (1984) presented the significance of stress in the medical school setting as an important positive factor in learning and in getting things done. Even so, constant exposure to high levels of stress is not ideal (Linn and Zeppa, 1984), as it can negatively affect the students' health. The causes of stress in medical schools are multifactorial, but a study at a Malaysian medical school has found that its relationship does not cause relevant differences in overall patterns of stressors, and that academic-related matters, in general, are still the primary root stressors experienced by

medical students (Yusoff and Abdul rahim, 2010).

Support-seeking behavior, acceptance of one's vulnerability to emotion, socialization, active involvement (engagement), positive reinterpretation, problem solving, and rationalization are just some key strategies promoting better management of stress and other positive outcomes (Fares et al., 2016). Several studies have recommended the relevance of social support from the institution — its faculty and counseling services — peers, family and participating in extracurricular activities, as the most helpful coping mechanisms, especially to students who are at risk of high levels of stress (Batista et al., 2018; Chang et al., 2012). Studies highly suggest encouraging the participation in extracurriculars, as this may promote positive and healthier behaviors that can be a means of de-stressing for most medical students (Batista et al., 2018; Fares et al., 2016; Frank et al., 2005). Regarding this, the study investigated a common coping strategy — participation in extracurricular activities — and its association with academic stress among first year to third year medical students of UERMMMCI for the academic year 2019-2020. Other factors such as gender, time commitment in participation with extracurricular activities, and number of extracurricular activities joined for each respondent were also considered.

Involvement in Extracurriculars

Students who claimed that they did not participate in extracurricular activities had shown a significant positive association with academic stress, hence, suggesting the significance of participation in extracurricular activities as a possible means to healthily cope with the academic stress experienced. This result was aligned with prior studies done by Hill et al. (2018) and Fares et al. (2016), where students who participated in extracurricular activities related to music, physical exercise, playing sports, socializing without alcohol, their hobbies and joining organizations reported to be less stressed as compared to those who do not. Studies of Batista et al. (2018) and Singh and Upadhyay (2008) showed that the academic adjustment of students who actively participate in extracurricular activities fared better. This is also evidenced in Astin's (1999) model of student involvement where it suggested that there is a direct relationship between students' involvement in extracurricular activities and students' learning and personal advancement in higher education. Moreover, this is supported by Zhang (2000) where it indicates that involvement in extracurricular activities can enhance intrinsic motivation in learning among students.

Several aspects of students' well-being may also be promoted as suggested by Almalki et al. (2017), Zhang and Zheng (2017), and Toyokawa and Toyokawa (2002). To name a few, students' noted improvement on their social skills, became more productive and were generally satisfied with themselves - gaining more self-confidence and mindfulness. Hunt (2005) also suggested that students who are more likely to enjoy an increased sense of accomplishment, competence, and self-esteem, are those who engage in extracurricular activities. A study by Wilson (2009) revealed the strong relationship between joining student organizations and psychosocial development, especially on establishing purpose, educational involvement, career planning, life management, and cultural participation.

However, results from this study are contradictory with the findings in the study of Chan (2016), where it

showed that the involvement in extracurricular activities might not help in the enhancement of the academic performance of students. The result also contradicts Black (2002), Chambers and Schreiber (2004) and Leung et al. (2011), where they suggest that there is no direct relationship between extracurricular activities and academic outcomes. Nonetheless, several studies support the findings of this study. Ahmad et al. (2015) and McCarthy et al. (2000) suggested that students who participated in extracurricular activities had better attendance rate that would indicate lesser stress and better mental state among these students. The study of McCarthy et al. (2000) also highlighted that students who participated in extracurricular activities have higher GPA's. Furthermore, it was shown that activity participation can be linked to positive academic outcomes, improved grades, test scores, more engagement in class, less absenteeism, and increased educational aspirations (Fredrick and Eccles, 2006).

Time Commitment and Number of Activities

Results had also shown that an odds ratio 1.1 (for 9-12 hours committed) and 1.2 (for the frequency involved in 4 extracurriculars) were not considerably strong positive associations, as the values were nearer to 1, thus results were inconclusive. Weak positive associations were correlated with the time commitment of 9 to 12 hours, and in a greater number of extracurricular activities involved in (4 counts), albeit both do not have significant association with academic stress (see Table 7), respectively. Analysis across respondents who participated in extracurriculars, garnered consistently negative associations for time commitment below 9 hours and for extracurricular counts below 4, which is relatively a good outcome.

As with prior studies, it was proven that there is a direct correlation between the number of hours spent in extracurricular activities, and the well-being of students (Fredricks, 2011; Foubert & Grainger, 2006). Academic performance can be compromised if a student allots ample amount of time on extracurricular activity participation (Wilson, 2009). Such extracurricular activities, like social activities that focus on volunteering, can be energy and time-consuming and in turn, might negatively influence academic performance (Fares et al., 2015). Students with greater time participation in extracurricular activities may have difficulty balancing social and academic life – leading to more depressive symptoms, manifesting as undergoing existential crises, and compromised academic performance due to lack of focus (Arip et al., 2016; Knifsend & Graham, 2012).

This contrasted with the study of Almalki et al. (2017) where it was found out that the frequency of attendance in extracurricular activities does not influence the development of burnout. Varying results may be linked to the difference in the time management of each medical student when handling their academics and their extracurricular activities – basically their individuality. Each student has a specific need and unique way of balancing socialization and responsibility – which is not far from how these students would respond between extracurricular activities and accomplishing academic tasks.

Good time management skills that involve prioritization of activities and sensible usage of time during organizational tasks were found to determine academic performance. Aside from this, those with good time management behavior were also found to have fewer psychological and physical symptoms related to stress (Joseph et al., 2020; Misra and McKean 2000; Macan et al., 1990). Indeed, social activities require

responsibility, dedication, time, and energy to prepare and render them well (Wilson, 2009), but it is important that a student must establish their priorities – forming a sense of responsibility, accountability and the right discernment on their priorities.

Gender

The results had also reported that although non-significant, the odds ratio for females was higher as compared to males (Table 4) and in fact, several studies have shown that female medical students were relatively more prone to higher academic stress levels than their male counterparts. Fares et al. (2016) found that women are more likely to be at risk of stress than men. Dyrbye et al. (2006) suggests that this may be because women are more likely to view difficult situations as stressful. Despite this, studies have reported that females yielded lower burnout rates when involved in an extracurricular activity than their male counterparts (Costa et al., 2012; Verma et al., 2011; Palen & Coatsworth, 2007). This could be attributed to psychological, social, physiological, and biological factors (Cecil et al., 2014; Cirone & Saks, 2015; Dhull & Kumari, 2015). Differences can span between the perceptions of stress, their coping styles, and the predominance of stress hormones when dealing with a stressful situation.

In a study of Naseem et al. (2019) among University students, it was found out that women were more prone to higher levels of anxiety and depression among ages 19 to 24 years old; these women were more likely to seek psychological help than men. However, it must be noted that men ask for help indirectly through friends, partner, and family rather than seeking professional help. The trapping view of society of men such as perceived vulnerability in seeking help renders it unacceptable to seek help from professionals (Tudiver & Talbot, 1999).

Naturally, stress is part of our body's fight or flight response when faced with tense situations and is generally the body's adaptive response. A popular definition by McGrath in 1976 states that stress is an interaction between the (perceived) substantial imbalance of demand (stimuli) and the body's inherent capability to respond to these stimuli, consisting of a "number of normal reactions of the body - mental, emotional, and physiological - that is designed for self-preservation (Chang et al., 2012). On the physiological level, males have the advantage. Although males have a higher risk of developing burnout than females, a study by Backovic et al. (2012) showed that increased levels of female sex hormones such as progesterone reduce the force of the sympathoadrenal and hypothalamic-pituitary axis responsiveness, leading to the sluggish negative feedback of cortisol on the brain.

Since there is a continuous surge in stress hormones, there is less or delayed containment of the stress response – linking women's increased susceptibility of developing depression, which is another serious concern. According to some researchers, this increased risk is owed to the general personality traits common to females such as being sensitive and sincere in nature and having a serious perception of the world around them (Melaku et al., 2015; Singh & Upadhyay, 2008). Brougham et al. (2009) showed in their study among college students, that although women are more stressed than men, they make greater use of emotion focused strategies to cope while men are more prone to use maladaptive strategies in coping such as self-punishment and avoidance.

However, despite this cultural and societal conception of women's said characteristics, justified by scientific explanation, these traits – and being in touch with emotion – are still beneficial and important. Because of these, females tend to form positive coping styles, and are noted to have positive perceptions on stress. This method is known as cognitive restructuring, wherein negative thoughts are remodeled, thus contributes to the lesser burn-out rates noted in women.

Gender cannot be considered the primary or significant contributory factor to stress as it has not been established due to the varying claims of several studies (Domantay, 2014). Again, it must be noted that men cope differently than women and are less likely to admit to stress and thus less likely to seek professional help (Tudiver & Talbot, 1999). Both men and women have their own and overlapping coping styles and although varying do not make it less effective (Khan et al., 2013).

Year-level Variability

For the year-level variability, the first years were considered as the baseline. Substantially, medical students undergo frequent periods of adjustment and stress, depending on the specific year level they are in (Domantay, 2014). This is reflective of the data incurred from the medical students enrolled in this institution for this school year. The odds of academically stressed medical students in second- and third-year levels were higher than the first-year students (see Tables 5-6). This could be due to increased academic workload of the higher year levels than first year students. First-year students are expected to join more extracurricular activities, as compared to higher year levels, either out of curiosity, need for socialization, or just because of their less busy schedules. The first year of medical school has been tagged as a vital adjustment period for students toward a new environment, increased academic demands and challenges.

Mehfooz and Haider (2017) suggested that considerable stress is experienced during their third year in medical school which is at par with the results of the study. Learning in medical school will rapidly transition to more clinically oriented courses within the second and third-year levels before an entirely whole new setting is experienced at the fourth year - clinical training in the hospital (Verma et al., 2011). Reflecting on this scenario, among the year levels, the second-year students had the highest odds of developing academic stress, plausible to the fact that there is increased demand in academic workload and students' adjustment to the clinical aspect of medical education, compared to the basic science courses during the first year (Domantay, 2014; Verma et al., 2011). Second-year medical students are more likely to take leadership roles as their respective extracurriculars, adding to the experienced pressures of academics (Cirone & Saks, 2015).

Meanwhile, assessment of third years found that despite being more stressed than first-years, third years had lower academic stress levels than second years. This may be because at this year level, students had already adapted and developed some of the more mature, and healthier necessary coping skills in surviving medical school. Third-year students are better, but not entirely, adjusted to the medical curriculum after more than two years of medical education. Our results were supported by a study conducted by Acosta-Gomez et al. (2018), confirming the varying stress levels per year level, with first year and third-year students having significantly

lesser stress as compared to second year students.

Medical students can adapt to increasing amounts of stress over the years, since they have gained more effective coping techniques and the demands of medical school in comparison with their first few years in medical school and training (Costa et al., 2012). This can also suggest that these students may be better at juggling time with handling academic responsibilities and extracurriculars, although this cannot be concluded in our study. Higher year level students are also better at handling themselves emotionally as compared with their first year in medical school (Domantay, 2014). Further studies within the institution are needed regarding this for it to be proven. One study emphasized that third-year medical students were under much more stress as compared to first year and second-year levels, since there is a higher frequency of tests and examinations that third year medical students take (Saipanish, 2003). However, in the studies of Melaku et al. (2015) and Singh and Upadhyay (2008) the highest prevalence of stress was among first year medical students, ascribed to the difficulty of adjusting to the new learning environment, as well as higher failure rates in comparison to later years in medical school.

It should be noted that medical students may also experience different challenges and may have different major stressors depending on their year level. Hill et al. (2018) found that there are differences between the impact of different stressors to students in their preclinical years compared to those in their clinical years. Across the year levels, time management challenges and deficiencies in study skills both have the same impact. For those in first year, the major stressor is associated with the change and transition from college to graduate school, while stress in relation to a more competitive and less supportive environment seems to peak during their second year. In the study, these were the preclinical years. For third- and fourth-year students (clinical years) the most significant stressors were related to time management (balancing school and clinical duties with other life responsibilities) and having first-hand experience with mortality and suffering, respectively.

Despite the conflicting literature, it should be acknowledged that there are a multitude of factors to be considered. Different year-levels have different demands, thus different needs must be met. This also goes to the other points assessed in this study. Unless an exact cause can be ruled in, the year-level variability on stress experienced, and with the other factors assessed, are still non-conclusive, but can give us an insight on what needs to be addressed. Awareness of students' concerns can effectively address the constantly ever-changing needs of an institution's current support programs on mental and physical health according to the prevailing trends among students, and the importance of promoting positive coping strategies (Verma et al., 2011).

Conclusion

Our study showed that almost half of the students at medical school do not participate in extracurricular activities, which had a significant positive association with academic stress. It was also shown that the odds of females who were stressed were higher than their male counterparts. Moreover, among year levels, the odds of second year students who develop stress were highest among the other year levels. Hours spent and the number of extracurriculars had a low positive association with academic stress.

Based on the results of the study, it can be deduced that participation in extracurricular activities may be a good coping strategy against academic stress. Thus, students are encouraged to join extracurricular activities, but will still be under each student's discretion. Counseling, preferably focused on time management and prioritization, and of course, general wellness, if possible, would also be of great benefit to the students. However, should they opt to participate, students must choose activities that will not exceedingly interfere with their academic responsibilities.

Recommendations

The researchers recommend for further study about the association of extracurricular activities to academic stress by including other factors such as the type of activities (i.e., sports, music, arts, theater, etc.) the students engage in. Additionally, variables such as financial status, family support and mental state can also be considered in further study of the association of extracurricular activities and academic stress since stress is multifactorial.

Acknowledgements

We would like to extend our sincerest gratitude to the people who made our research possible and successful.

Participating Investigators

We extend our sincerest thanks to Lara Thea B. Garde, Anna Veronika P. Go, Jose Miguel A. Goyena, Gian Carlo P. Gonzales, Willard Jaeger K. Madrazo and Justin S. Gonzales for helping in the data sampling, collection, and interpretation.

Advisers

We extend our utmost gratitude to Dr. Jose Ronilo Juangco and Dr. Cherry-Rich Cheng for their guidance and for sharing their expertise in the research.

Department and Staff

We would like to reach out our sincerest thanks to the Department of Preventive Medicine, to the faculty and secretaries who provided us with some solutions when we had lapses on our research, or questions.

Institution

We would also like to thank the UERMMMCI – College of Medicine student body for allowing us to gather data from them, despite the busy schedule they have. We appreciate the time each of you have spared for us for making this research possible.

References

Abdulghani, H.M., AlKanhal, A.A., Mahmoud, E.S., Ponnamperuma, G.G., Alfaris, E.A. (2011). Stress and its effects on medical students: a cross-sectional study at a college of medicine in Saudi Arabia. *J Health Popul Nutr, 29*(5), 516-22. DOI: 10.3329/jhpn.v29i5.8906

Acosta-Gomez, M.G., De la Roca-Chiapas, J.M., Zavala-Bervena, A., Rivera, C.A., Reyes, P.V., Da Silva, R.C., et al. (2018). Stress in High School Students: A Descriptive Study. *Journal of Cognitive Behavioral Therapy, 1*(1), 1-10.

Ahmad M, Rahman MF, Ali M et al. (2015). Effect of Extracurricular Activity on Student's Academic Performance. *JAFMC Bangladesh, 11* (2): 41-46.

Almalki, S., Almojali, A., Alothman, A., Masuadi, E., Alaqeel, M. (2017). Burnout and its association with extracurricular activities among medical students in Saudi Arabia. *International Journal of Medical Education, 8*, 144-150. DOI: 10.5116/ijme.58e3.ca8a

Alsulami, S., Omar, Z.A., Binnwejim, M., Alhamdan, F., Aldrees, A., Al-Bawardi, A, et al. (2018) Perception of academic stress among Health Science Preparatory Program students in two Saudi universities. *Advances in Medical Education and Practice, 9*, 159–64. DOI: 10.2147/AMEP.S143151

Anuradha, R., Dutta, R., Raja, J.D., Sivaprakasam, P., Patil, A.B. (2017). Stress and Stressors among Medical Undergraduate Students: A Cross-sectional Study in a Private Medical College in Tamil Nadu. *Indian J Community Med, 42*(4), 222-225. DOI: 10.4103/ijcm.IJCM_287_16

Arip, M.A., Kamaruzaman, D.N., Roslan, A.B., Ahmad, A.B. (2016, September). Manual of student stress inventory (SSI) development, validity, and reliability of Student Stress Inventory. Retrieved from: https://www.researchgate.net/publication/316662054_MANUAL_OF_STUDENT_STRESS_INVENTORY_SSI_Development_Validity_And_Reliability_of_Student_Stress_Inventory_SSI

Astin AW. (1999). Student involvement: A developmental theory for higher education. *Journal of College Student Development*, 40 (5): 518-29.

Backovic, D.V., Zivojinovic, J.I., Maksimovic, J., Maksimovic, M. (2012). Gender differences in academic stress and burnout among medical students in final years of education. *Psychiatr Danub, 24*(2), 175-81. PMID: 22706416.

Baldassin S, de Toledo Ferraz Alves TC, de Andradel AG, Martins LAN. (2008). The characteristics of depressive symptoms in medical students during medical education and training: a cross-sectional study. *BMC Med Educ, 8:* 60. Doi: 10.1186/1472-6920-8-60

Batista, S., Santiago, L.M., Rosendo, I. (2018) Reasons for Perfectionism and Intolerance to Frustration in Medicine Students of University of Coimbra. *Acta Medica Portuguesa, 31*(10). DOI: 10.20344/amp.9976

Bergmann C, Muth T, Loerbroks A. (2019). Medical students' perceptions of stress due to academic studies and its interrelationships with other domains of life: a qualitative study. *Med Educ Online, 24* (1): 1603526. Doi: 10.1080/10872981.2019.1603526

Black S. (2002). The well-rounded student. *American School Board Journal*, 189 (6): 33-5.

Brenneisen MF, Souza SI, Silveira PSP, et al. (2016). Factors associated to depression and anxiety in medical students: a multicenter study. *BMC Med Educ, 16*: 282. Doi: 10.1186/s12909-016-0791-1

Brougham, R. R., Zail, C. M., Mendoza, C. M., & Miller, J. R. (2009). Stress, Sex Differences, and Coping

Strategies Among College Students. *Current Psychology*, 28(2), 85–97. doi:10.1007/s12144-009-9047-0

Cecil, J., McHale, C., Hart, J., Laidlaw, A. (2014). Behaviour and burnout in medical students. *Med Educ Online, 19*, 25209. DOI: 10.3402/meo.v19.25209.

Chambers EA, Schreiber JB. (2004). Girls' academic achievement: Varying associations of extracurricular activities. *Gender and Education, 16* (3): 327-46.

Chan YK. (2016). Investigating the relationship among extracurricular activities, learning approach and academic outcomes: A case study. *Active Learning In Higher Education, 17* (3): 223-233. https://doi.org/10.1177/1469787416654795

Chang, E., Eddins-Folensbee, F., Coverdale, J. (2012). Survey of the Prevalence of Burnout, Stress, Depression, and the Use of Supports by Medical Students at One School. *Academic Psychiatry, 36*(3), 177. DOI: 10.1176/appi.ap.11040079

Chen, J., Wu, Y., Yi, H., Li, Z., Eshita, Y., Qin, P., et al. (2013). The impact of academic stress on medical students attending college in the Inner Mongolia Area of China. *Open Journal of Preventive Medicine, 03*(02), 149–54. DOI: 10.4236/ojpm.2013.32019

Cirone, J., Saks, N.S. (2015). Medical Student Engagement in Extracurricular Activities. *Medical Science Educator, 25*(3), 293–7. DOI: https://doi.org/10.1007/s40670-015-0142-6

Costa, E.F., Santos, S.A., Santos, A.T., Melo, E.V., Andrade, T.M. (2012). Burnout Syndrome and associated factors among medical students: a cross-sectional study. *Clinics (Sao Paulo), 67*, 573–580. DOI: 10.6061/clinics/2012(06)05

Dahlin, M., Joneborg, N., Runeson, B. (2005). Stress and depression among medical students: a cross-sectional study. *Medical Education, 39*(6), 594-604. DOI: 10.1111/j.1365-2929.2005.02176.x

Dhull, I., Kumari, S. (2015). Academic stress among adolescents in relation to gender. *International Journal of Applied Research, 1(*11), 394-396.

Domantay, J.A.A. (2014). Health-Related Quality of Life of Future Physicians at a Medical School in the Philippines. *SAGE Open, 4*(3), 215824401454545. DOI: https://doi.org/10.1177/2158244014545459

Dyrbye LN, Thomas MR, Shanafelt TD. (2006). Systematic review of depression, anxiety and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med,* 81: 354-373.

Dyrbye, L.N., Thomas, M.R., Huschka, M.M., et al. (2006). A multicenter study of burnout, depression, and quality of life in minority and non-minority US medical students. *Mayo Clin Proc*, 81, pp. 1435-1442

Eccles J, Barber B, Stone M, et al. (2003). Extracurricular activities and adolescent development. *Journal of Social Issues, 59* (4): 865-89.

Fares J, Saadeddin Z, Al Tabosh H, et al. (2015). Extracurricular activities associated with stress and burnout in preclinical medical students. Journal of Epidemiology and Global Health, 6(3), 177. doi:10.1016/j.jegh.2015.10.003

Fares, J., Tabosh, H.A., Saadeddin, Z., Mouhayyar, C.E., Aridi, H. (2016). Stress, burnout and coping strategies in preclinical medical students. *North American Journal of Medical Sciences, 8*(2), 75. DOI: 10.4103/1947-2714.177299

Foubert, J., Grainger, L. (2006). Effects of Involvement in Clubs and Organizations on the Psychosocial Development of First Year and Senior College Students. *NASPA Journal, 43*(1), 166-182, DOI: 10.2202/1949-6605.1576

Frank, E., Smith, D., Fitzmaurice, D. (2005). A description and qualitative assessment of a 4-year intervention to improve patient counseling by improving medical student health. *MedGenMed, 7*(2), 4. PMID: 16369383; PMCID: PMC1681578.

Fredricks L, Eccles I. (2006).Is extracurricular participation associated with beneficial outcomes? Concurrent and longitudinal relations. *Developmental Psychology*, 42 (40: 698-713.

Fredricks, J.A. (2011). Extracurricular Participation and Academic Outcomes: Testing the Over-Scheduling Hypothesis. *Journal of Youth and Adolescence, 41*(3), 295–306. DOI: 10.1007/s10964-011-9704-0

Garg, K., Agarwal, M., Dalal, P.K. (2017). Stress among medical students: A cross-sectional study from a North Indian Medical University. *Indian J Psychiatry, 59*(4), 502-504. DOI: 10.4103/psychiatry.IndianJPsychiatry_239_17

Hill, M.R., Goicochea, S., Merlo, L.J. (2018). In their own words: stressors facing medical students in the millennial generation. *Med Educ Online, 23*(1), 1530558. DOI:10.1080/10872981.2018.1530558

Hope V, Henderson M. (2014). Medical student depression, anxiety and distress outside North America: a systematic review. *Med Educ, 48* (10): 963-79. doi:10.1111/medu.12512

Hunt DH. (2005). The effect of extracurricular activities in the educational process: Influence on academic outcomes. *Sociological Spectrum, 25* (4): 417-45.

Jadoon Na, Yaqoob R, Raza A, et al. (2010). Anxiety and depression among medical students: a cross-sectional study. *J Pak Med Assoc., 60* (8): 699-702.

Joseph N, Nallapati A, Machado M. X, et al. (2020). Assessment of academic stress and its coping mechanisms among MEDICAL undergraduate students in a large Midwestern university. Current Psychology. doi:10.1007/s12144-020-00963-2

Kelly, D. (2012). *An Investigatory Study into the Relationship between Extracurricular Activities and Stress/Worry in Exam Years*. (Unpublished undergraduate thesis). DBS School of Arts, Dublin.

Khan, M.J., Altaf, S. and Kausar, H. (2013). Effect of Perceived Academic Stress on Students' Performance. *FWU Journal of Social Sciences*, Winter, Vol. 7, No. 2, 146-151

Knifsend, C. A., & Graham, S. (2012). Too much of a good thing? How breadth of extracurricular participation relates to school-related affect and academic outcomes during adolescence. *Journal of Youth and Adolescence, 41*(3), 379-389. DOI: 10.1007/s10964-011-9737-4

Leung CH, Ng CWR, Chan POE. (2011). Can co-curricular activities enhance the learning effectiveness of students? An application to the sub-degree students in Hong Kong. *International Journal of Teaching and Learning in Higher Education, 23*(3): 329-41.

Linn, B.S., Zeppa, R. (1984). Stress in junior medical students: relationship to personality and performance. *J Med Educ, 59*:7-12. PMID: 6690704

Macan, T. H., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College students' time management: Correlations with academic performance and stress. Journal of Educational Psychology, 82, 760–768.

McCarthy K. (2000). *The Effects of Student Activity Participation, Gender, Ethnicity and Socio-Economic Level on High School student Grade Point Averages and Attendance*. 1st ed. New York. National Association of African American Studies & National Association of Hispanic and Latino Studies. pp. 410-24.

Mehfooz QUA, Haider SI (2017) Effect of Stress on Academic Performance of Undergraduate Medical Students. J Community Med Health Educ 7:566. DOI: 10.4172/2161-0711.1000566

Melaku, L., Mossie, A., Negash, A. (2015). "Stress among Medical Students and Its Association with Substance Use and Academic Performance," *Journal of Biomedical Education, 149509:*1-9. DOI: https://doi.org/10.1155/2015/149509.

Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. American Journal of Health Studies, 16, 41–51.

Naseem, N., Nas, L., and Zehra, N. (2019). Prevalence of Stress and Depression among University Students of Karachi. *Pakistan Journal of Neurological Sciences (PJNS)*, 14(1): Article 10.

Palen, L.A., Coatsworth, J.D. (2007). Activity-based identity experiences and their relations to problem behavior and psychological well-being in adolescence. *Journal of Adolescence, 30*, 721-737. DOI: 10.1016/j.adolescence.2006.11.003

Ruzhenkova, V., Ruzhenkov, V., Lukyantseva, I., Anisimova, N. (2018). Academic stress and its effect on medical students' mental health status. *Drug Invention Today, 10* (7): 1171-1174.

Saipanish, R. (2003). Stress among medical students in a Thai medical school. *Medical Teacher, 25*(5), 502-506. DOI: 10.1080/0142159031000136716

Salam A, Yousuf R, Bakar SMA, Haque M. (2013). Stress among Medical Students in Malaysia: A Systematic Review of Literatures. *International Medical Journal, 20* (6): 649-655.

Silva V, Costa P, Pereira I, Faria R, Salgueira A, Costa M, Sousa N, Cerqueira J, Morgado P. (2017). Depression in medical students: insights from a longitudinal study. *BMC Med Educ, 17*: 184. doi:10.1186/s12909-017-1006-0

Singh, A., Upadhyay, A. (2008). "Age and sex differences in academic stress among college students," *Social Science International, 24*(1), 78-88.

Stuart M, Lido C, Morgan J, et al. (2011). The impact of engagement with extracurricular activities on the student experience and graduate outcomes for widening participation populations. *Active Learning in Higher Education*, 12 (3): 203-15.

Toyokawa, T., Toyokawa, N. (2002). Extracurricular activities and the adjustment of Asian international students: A study of Japanese students. *International Journal of Intercultural Relations, 26*(4), 363–379. DOI: 10.1016/s0147-1767(02)00010-x

Tudiver, F. and Talbot, Y. (1999). Why don't men seek help? Family physicians' perspectives on help-seeking behavior in men. *J Fam Pract*. 48(1):47-52. PMID: 9934383.

Verma, R., Balhara, Y.P.S., Gupta, C.S. (2011). Gender differences in stress response: Role of developmental and biological determinants. *Ind Psychiatry J., 20* (1): 4-10. DOI: 10.4103/0972-6748.98407

Wilson, N. (2009). Impact of Extracurricular Activities on Students. University of Wisconsin-Stout. (Unpublished MS thesis). University of Wisconsin-Stout, Menomonie, WI.

Yusoff MSB, Rahim AFA, Yaacob MJ. (2010). Prevalence and Sources of Stress Among Universiti Sains Malaysia Medical Students. *Malays J Med Sci*, *17* (1): 30-37.

Yusoff, M.S.B, Abdul rahim, A.F. (2010, February). The Medical Student Stressor Questionnaire (MSSQ) Manual. Retrieved from: https://www.researchgate.net/publication/200640404_The_Medical_Student_Stressor_Questionnaire_MSSQ_Manual

Zhang LF. (2000). University students' learning approaches in three cultures: An investigation of Bigg's 3P

model. *Journal of Psychology*, 134 (1): 37-55.

Zhang, J., Zheng, Y. (2017). How do academic stress and leisure activities influence college students' emotional well-being? A daily diary investigation. *Journal of Adolescence, 60*, 114–118. DOI: 10.1016/j.adolescence.2017.08.003

Author Information

Hannah Abigail A. Gruyal
https://orcid.org/0000-0001-5589-4812
University of the East Ramon Magsaysay Memorial Medical Center, Inc.
64 Aurora Blvd, Quezon City, 1113 Metro Manila
Philippines
Contact e-mail: *hannah12_gruyal@yahoo.com*

Patricia Elisse I. Madiam
https://orcid.org/0000-0002-6671-1628
University of the East Ramon Magsaysay Memorial Medical Center, Inc.
64 Aurora Blvd, Quezon City, 1113 Metro Manila
Philippines

Michellie Anne O. Gregorio
https://orcid.org/0000-0002-6134-9084
University of the East Ramon Magsaysay Memorial Medical Center, Inc.
64 Aurora Blvd, Quezon City, 1113 Metro Manila
Philippines

Marie Elizabeth H. Magsombol
https://orcid.org/0000-0002-3349-4313
University of the East Ramon Magsaysay Memorial Medical Center, Inc.
64 Aurora Blvd, Quezon City, 1113 Metro Manila
Philippines

Alyszea Andria O. Guanzon
https://orcid.org/0000-0002-4821-1160
University of the East Ramon Magsaysay Memorial Medical Center, Inc.
64 Aurora Blvd, Quezon City, 1113 Metro Manila
Philippines

Ma. Therese Lafayette H. Magtibay
https://orcid.org/0000-0002-0439-6052
University of the East Ramon Magsaysay Memorial Medical Center, Inc.
64 Aurora Blvd, Quezon City, 1113 Metro Manila
Philippines