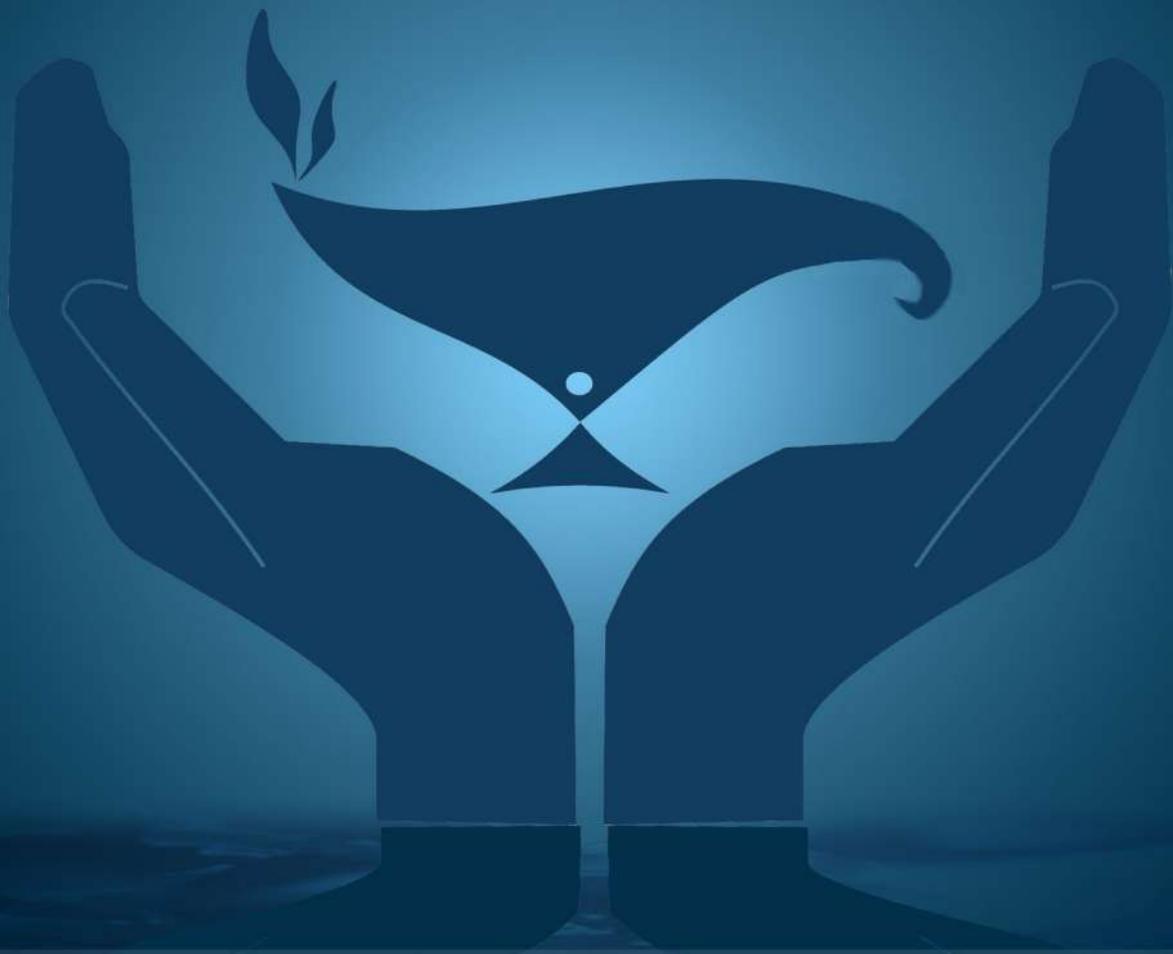


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# Analysis The Student Perception of Application Clinical Skills Online Learning in The Pandemic Time Covid-19

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## Abstract

**Background:** Government policies that apply social distancing, work from home, and learn from home to prevent the spread of the Covid-19 corona virus have an impact on learning methods. Clinical learning methods in pre-pandemic health education are carried out in campus laboratories and direct clinical services to patients. Thus, in this condition, the provision cannot be implemented.

**Purpose:** For this reason, it is necessary to modify the learning method from offline to online to meet the continuity of the student learning process.

**Methods:** In the first stage, the clinical skills online learning method using online videos is supported by lecturers' explanations in a 120-minute meeting. In the second stage, students are given the task of making videos of procedural skills that have been taught in 170 minutes, with a video duration of 10-15 minutes. At the next meeting, a review or response is carried out with students on the standard operating procedure and the theory that underlies it. The design in this study is a descriptive analysis with 511 respondents from the medical education study program and the nursing diploma 3 study program at the Faculty of Medicine, Mulawarman University. The research used was 44 items of statement questionnaire that had been tested for validity and reliability, and questionnaire items were sent to respondents via Google Forms.

**Results:** From the results of this study, there is a significant relationship between the perceptions of students who apply clinical skills online learning seen from the effectiveness of learning in the Covid-19 pandemic era with p-value = 0.000, with a very strong relationship with the Spearman value rho of 0.791 in a positive direction.

**Conclusion:** Thus, it can be concluded that the application of online clinical skills learning during the Covid-19 pandemic was effective. As a suggestion, clinical learning methods with various blended learning or hybrid learning methods should be modified.

**Keywords:** clinical skills online learning; pandemic Covid-19; student perception

## Introduction

The complexity of handling this outbreak has made world leaders implement super strict policies to break the chain of the spread of Covid-19. Social distancing is a policy to prevent the spread of Covid-19, because people stay at home as much as possible, stay away from crowds, and do not travel if it is not necessary. Social distancing, which literally means keeping a distance from social life or maintaining physical distance from other people, will slow the spread of the corona virus which is transmitted through droplet contamination or saliva splashes at a distance of 1 or 2 meters. With social distancing, the risk of contracting Covid-19 from other people will decrease (Abel & Mcqueen, 2020).

The Corona virus that continues to spread in Indonesia has made various elements decide to follow government directions by working from home or

working at home, including the world of education in Banyumas Regency which also implements learning at home. From kindergartens to public and private colleges, all learning activities are conducted from home. This is because social distancing is one of the most appropriate steps to reduce the spread of the virus. Several steps to continue the teaching and learning process are also carried out with an online system. Based on the Circular of the Minister of Education and Culture of the Republic of Indonesia No. 3 of 2020 concerning the Prevention of COVID-19 in the Education Unit, all higher education levels in Indonesia have taken from steps on the government's appeal to carry out learning activities from home (Darmalaksana, Hambali, Masrur, & Ushuluddin, 2020).

In general, clinical learning methods in health education before the pandemic period were carried out by learning in campus laboratories with live demonstrations by lecturers, accompanied by clinical skill video screening, and students doing these skills to be assessed by lecturers. After students are declared to have passed the clinical skill test, they can carry out clinical practice to handle patients and implement clinical skills competencies to patients directly with the guidance and assessment from the clinical supervisor. Well-developed clinical reasoning skills are central to the process of clinical assessment (Yauri, Nash, & Ramsbotham, 2019).

Higher education institutions make internet-based applications that are familiar with the term e-learning (both in the form of websites and applications). Not only that, it is also necessary to develop an internet-based information system application that is easy to use from day to day in the online guidance process (Andrian & Fauzi, 2020).

E-learning is an electronic system-based learning process. In general, the benefits obtained are increased self-study skills and the ability to display information with technological devices. The implementation of online clinical learning also has drawbacks. One negative side of the online procedural skills learning process system is that not all lecturers and students have the same level of understanding about operating devices and internet network problems (such as the problem of running out of quota) and errors often occur with the internet network in certain areas (Meiza, Hanifah, Natanael, & Nurdin, 2020).

While the negative side of the application of the online procedural skills learning system is that not all students have the same level of understanding. Students who are diligent and quickly understand the information conveyed in the online tutoring process will easily follow the lesson. However, those who are not familiar with this method may find it difficult not only to understand the online-based learning material delivered by the lecturer, but also to adapt to the technology application used in the online guidance process (Tosida et al., 2020).

The learning process of clinical procedures in health education is the most crucial thing and must

receive very important attention and solutions to overcome problems during this pandemic in order to keep it running effectively and sustainably. One way to do this is by continuing to learn clinical procedures online. The online method used is the lecture method and video playback of certain clinical skills, then proceed with giving assignments to students to make videos about the procedural skills that have been taught. At the next meeting, there will be a review or assessment response by the lecturer in accordance with the standard operating procedure assessment and theoretical concepts related to these clinical skills. The application of effective and efficient clinical learning is one way to ensure the quality of the health education management system in general. The key to the success of students whose assessment must be up to 100% lies in learning clinical skills. Based on this background, the researchers wanted to analyze students' perceptions of online learning clinical skills at the Faculty of Medicine, Mulawarman University.

## Methods

The type of research used is quantitative research with a descriptive analytic approach. The design in this study is cross sectional, where the dependent and independent variable data are obtained in onetime period. The sampling technique used in this study is random sampling (Dharma, 2011). Data analysis uses univariate with the number of respondents and the percentage. Bivariate analysis uses Spearman Rho. Respondents of this study came from 308 medical students and 203 nursing students. Respondents filled out 44 questionnaires via Google form. This research has received approval from the Mulawarman University research ethics committee with Ethics Approval Letter Number: 51/KEPK-FK/XI/2020.

## Results

Respondents are students who have experienced this clinical skills online learning method. The univariate variables that will be seen are the online learning method stage 1, stage 2 and the effectiveness of learning stage 1, stage 2 and both stages from the students' point of view.

Based on research data, there were 308 students (60.3%) of the medical education study program, and 39.1% of the nursing diploma 3 study program. This makes it easier to obtain valid data because this learning method has been implemented in the medical education study program since the first semester. Students who filled out the most appropriate questionnaire were students in semester 3 and above, namely 352 people (68.9%), which made the results more valid and effective. This is in accordance with the sample criteria, namely students who have participated in learning methods like this. The results of this study indicate

**Table 1.** Distribution of Respondent Characteristics Based on the Origin of Study Programs and Semester of FK Unmul Students in 2020 (n=511)

Variable	n	%
Study Program		
Nursing Students	203	39.7
Medical Stdents	308	60.3
Semester		
1	159	31.1
3	202	39.5
4	1	2
5	96	18.8
7	49	9.6
9	3	6
11	1	2

**Table 2.** Research variables on online clinical learning variables Phase 1, stage 2 and both stages and the effectiveness of learning stage 1, stage 2 and both stages during the Covid-19 pandemic in FK Unmul students in 2020 (n = 511)

Variable	n	%
Clinical Learning		
Good	262	51.3
Less Good	249	48.7
Effective Learning 1		
Effective	293	57.3
Less Effective	218	42.7
Clinical Learning 2		
Good	312	61.0
Less Good	189	39.0
Effective Learning 2		
Effective	268	52.4
Less Effective	243	47.6
Clinical Learning 1-2		
Good	295	57.7
Less Good	216	42.3
Effective Learning 1-2		
Effective	281	54.9
Less Effective	230	45.1

**Table 3.** The Relationship between Online Clinical Learning with Stage-1 Learning Effectiveness, the Relationship between Online Clinical Learning with Stage-2 Learning Effectiveness and the Relationship between Online Clinical Learning with Learning Effectiveness in Both Stages in FK UNMUL Students during the Covid-19 Pandemic in 2020 (n = 511)

Variable	P Value	Spearman-Rho	Conclusion
Clinical Learning 1	0.000	0.727	Effective Learning 1
Clinical Learning 2	0.000	0.597	Effective Learning 2
Clinical Learning 1-2	0.000	0.791	Effective Learning 1-2

that stage-1 of online clinical learning provides explanations using videos and explanations from lecturers. A total of 262 students stated that they were good (51.7%), and 293 students stated that they were effective (57, 3%).

The results of this study indicate that the stage-2 of online clinical learning is the task of making video skills according to what has been taught, then the lecturer will respond according to the standard operating procedure and the theoretical concept of these skills, and as many as 312 students stated this learning stage was good (61%), and 268 people (52.4%) stated that they were effective.

The results of this study indicate online clinical learning in stage-1 to 2, which are providing explanations using videos and explanations from lecturers and giving the task of making skill videos according to what has been taught then carrying out response by the lecturer according to the standard operating procedure and theoretical concepts from these skills. There were 295 students who stated that they were good (57.7%), and 281 students who stated that they were effective (54.9%).

## Discussion

Research related to the application of learning methods in new clinics was also carried out by Patmawati, Saleh, and Syahrul (2018) regarding the Effectiveness of Clinical Learning Methods on Critical Thinking Ability and Self-Confidence: A Literature Review. Based on the results of literature search, it is known that the learning method can improve the critical thinking skills and self-confidence of nursing students by the use of simulation method, or demonstrating something directly and it is done by watching videos and making videos of clinical procedure skills directly to patients.

Regarding the reflection of clinical skills laboratory learning, [Lisiswanti and Saputra \(2015\)](#) stated that learning clinical skills in the world is advancing rapidly in line with the development of science and education and medical technology. Learning clinical skills includes three competencies, namely the knowledge, skills and attitudes that a doctor must have. Clinical skills practice can be taught with patients and / or in clinical skills centers. Many factors influence the learning process of clinical skills. In learning clinical skills, there are many aspects that instructors must know, starting from curriculum, manuals, processes, content, instructor role, student motivation and environment. Learning clinical skills is a form of learning in the medical education curriculum which aims to improve the clinical and communication skills of medical education students. The Clinical Skill Lab (CSL) is a means for students to learn basic clinical skills which training is harmless and safe for patients. The addition of video learning media in clinical skills learning is one way to improve students' clinical skills This study aims to see the effect of the addition of video learning media on clinical skills of neuromotor phys-

ical examination of Medical Study Program FKIK UNJA students involving 128 students ([Natasha, Shafra, Charles, & Maharani, 2014](#)).

Group A students did not take part in the clinical skills learning session in the laboratory with the instructor, students can continue to practice clinical skills based on the step-by-step guide as shown in the learning video. Thus, learning videos can be a learning medium that needs to be developed into learning resources to overcome the limited time and resources of lecturers that may be encountered in medical faculties. From the comparison of the effectiveness of the Clinical Skill Lab (CSL) with learning using neurology clinical skills learning videos from the demonstration by [Aryanty, Puspasari, and Purwakanthi \(2014\)](#) it shows that videos provide education to increase knowledge. Health education using demonstration method is more effective in improving knowledge, attitudes, and skills of breast care among pregnant women than audio-visual methods ([Hayati, Marianthi, Nurhayati, & Sutanto, 2020](#)).

## Conclusion

Based on the research data, the largest number of students came from the medical education study program with as many as 308 people (60.3%), and students from the 3rd semester and above were 352 people (68.9%). The results of this study indicate that online clinical skills learning at stage-1 provides an explanation of clinical skills learning using videos and also explanations from the lecturers, and as many as 262 students stated that the clinical skills learning method was good (51.7%), and 293 students (57, 3%) stated that this learning was effective. The results of this study indicate that online clinical learning in stage-2 is to provide a task to make a video of the skills that have been taught, and then a review or response will be conducted by the lecturer according to standard operating procedure and theoretical concepts of these skills. 312 students stated that this stage of learning was good (61%), and students who stated that learning was effective were 268 people (52.4%).

The results of this study indicate that online clinical learning in stages-1 to 2 is providing explanations using videos and explanations from the lecturer, then making video skills according to what has been taught and then responsiveness will be carried out by the lecturer according to standard operating procedure and theoretical concepts of these skills, and as many as 295 students said it was good (57.7%), and 281 people (54.9%) stated that it was effective.

Based on the results of the study, the relationship between learning clinical procedural skills online during the Covid-19 pandemic using videos and lecturers' explanations with learning effectiveness is very strong and has a positive direction. Secondly, the relationship between learning clinical procedural skills stage-2 by giving the task of making clinical

skills videos and reviewing or responding to lecturers as well as evaluating the effectiveness of stage-2 learning is strong and has a positive direction. Lastly, the relationship between clinical learning stages-1 and 2, namely learning using videos and lecturers' explanations, giving the task of making clinical skills videos and reviews or responses from lecturers as well as learning effectiveness is very strong and has a positive direction.

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# Depression, Anxiety and Stress among Students amidst COVID-19 Pandemic: A Cross-Sectional Study in Philippines

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## Abstract

**Background:** COVID-19 considered as a global health crisis poses mental health problems among individual and specifics to students.

**Purpose:** This study aimed to determine the depression, anxiety, and stress levels among students amidst COVID-19 pandemic in Philippines.

**Methods:** A cross-sectional study was undertaken in Region 8, Eastern Visayas Philippines. A total of 311 tertiary respondents randomly selected both private and government owned higher education institutions. The data compilation was done using online questionnaires through Google Forms with validated version of the Stress, Anxiety and Depression Scales 21 (DASS21) is used to calculate students' level of stress, anxiety and depression with their socio-demographic features

**Results:** We revealed that depression, anxiety and stress are instituted in 18.6 %, 35.1 % and 2.85% of students, respectively, amidst the COVID – 19 pandemics. The symptoms of disorders were moderate to extremely severe in 6.1%, 23.5%, and 0.6% of the study sample, respectively. Age, gender, marital status and family history of illness are significantly different with age group 20 and below, females, singles, and families with no history of illness displaying high level of anxiety. Results also established an association between anxiety and family's monthly income and history of illness. The higher the monthly income and no presence of illness of families, the more anxious the person.

**Conclusion:** Finally, the variables used, explained only 1.5% depression, 3.4% anxiety and 1.4% stress in this time of COVID-19 outbreak. It is therefore recommended to essentially develop community-based mental health program for preventive purposes.

**Keywords:** anxiety; caring; COVID-19 pandemic; depression; nursing

## Introduction

There is no doubt the world has recorded an unprecedented viral outbreak these days (Boccaletti et al., 2020; Lin et al., 2020). The new high-infectious and destructive coronavirus (Choi, 2020; Ivanov, 2020; Ivanov & Dolgui, 2020) is confirmed to be COVID-19. This virus was first identified in China, Wuhan, in late 2019. It has spread around the world and has caused thousands of deaths and illnesses (H. Wang et al., 2009). As of 27 May 2020, 5.69 million confirmed cases and 355,575 deaths have already been reported worldwide. The number of confirmed cases has steadily increased. Without any type of medicine or Covid-19 immunization the disease has become a matter of concern More than one third (Kaplan & Milstein, 2021) of the world's population is locked with limited movements to control the widespread of the virus. People should be kept away from social contact, wear masks, and regularly hand washing (Cheng et al., 2020).

The Philippines is like the rest of the world in lock-down (Sahu & Kumar,

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**Table 1.** Socio-Demographic Characteristics of The Respondents (n = 311)

Category		n	%
Age	≤ 20 years	184	59.2
	≥ 21 years	127	40.8
Gender	Male	69	22.2
	Female	242	77.8
Marital status	Single	302	97.1
	Married	9	2.9
Family monthly income	≤ 5000	265	85.2
	5000 – 15000	41	13.2
	≥ 15001	4	1.3
Family history of illness	Yes	169	54.3
	No	142	45.7

2020). Its first confirmed case of COVID-19 was on March 7th, 2020. With recent increase of cases in the Philippines, various agencies issued a resolution on the management of the COVID-19 situation on 12 March 2020. It includes class suspension at all levels, prohibiting of mass gatherings, and community quarantine rules (Vallejo & Ong, 2020).

There has been the apprehension of the population as a result of the advent of a new pandemic in which people have really had no previous contact with it. This led them to stay at home and leave only if needed (Buenaventura et al., 2020). Continuous restrictions are not easy to deal with and people with depressive symptoms, negative effects, cognitive loss, and disturbance of sleep patterns can develop under the required confinement (Avasthi & Grover, 2018). The pandemic stress, anxiety, and depression follow well known behavioral reactions (Meng et al., 2020). The stress of any event that threatens our immune function can be defined as a state of emotional and physical distress. At the same time, anxiety is called fear of uncertainty, which is the normal response of the body to circumstances (Rehman et al., 2021). This fear leads to selfishness like panic buying, capitalist behaviour, xenophobia and belief in all social media news. The crisis occurs when there is the disbalanced and unintegrated culture in the Filipinos since the announcement of COVID-19 in the Philippines (Nicomedes & Avila, 2020). Crisis is evident in Filipinos' actions. People are always ready to share their resources within the family, but are too reluctant to communicate them to others because their individual development needs to be secured.

Depression is known in everyday lives as a condition of disinterest. It is believed that people facing an unvaccinated pandemic will trigger fear making them nervous, worried and depressed. Given the growing global concerns about mental distress, have suggested appropriate psychological health measures throughout this pandemic (Xiang et al., 2020). In addition, recommendations on the public interest have been published by the WHO to tackle potential psychological problems. Now what is worrisome is the increase anxiety of the corona

viral infection that culminates in people to commit suicide (Mamun et al., 2020). A study report during the initial phase of COVID-19 outbreak, Chinese citizens had a serious mental illness (anxiety, stress, depression) (C. Wang et al., 2020). Likewise, a further study conducted by Chinese people found mental illness (stress, anxiety, and depression) very widespread (Qiu et al., 2020).

Under normal circumstances, elevated rates of mental distress are typical for college students and downstream adverse academic effects (Granton, 2019). As a result of physical distancing behavior in the COVID-19 response, tertiary schools have switched to an online emergency learning system which is expected to further intensify student academic stress. Students may experience a reduced chance to study, additional pressure to learn independently, the abandonment of their everyday lives and potentially dropouts, as a result of direct impacts on these actions, on the basis of research on the impact of academic disruption on students (Grubic et al., 2020). As a result, the COVID-12 pandemic has created an unprecedented psychological burden, which urgently needs more assessment and immediate intervention, because academic stressors in people with elevated pre-existing stress levels and the ability to rely on traditional coping strategies – like the families themselves, who can have increased stress.

Research also showed that one of the classes with higher psychological problems were students (C. Wang et al., 2020). Although teachers seek to do what they can to educate online students, the results are not ideal. The key argument is that it is still doubtful that websites will be widely used and that major changes to distant learning will have an overwhelmingly veto effect on the future of students. Adolescence is a critical stage in psychological well-being growth and maintenance to a healthy adult life. Anxiety, depression and stress can significantly impact the health and academic achievement of adolescents through emotional disorders. Simply put, in an international health emergency like the one we are now experiencing, it is necessary to investigate the psychological effect

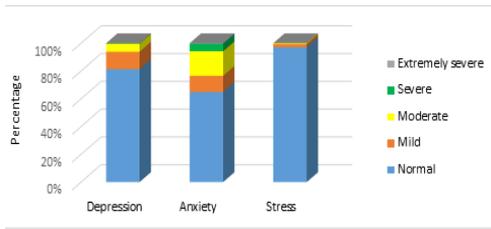


Figure 1. Respondents Level of Depression, Anxiety and Stress

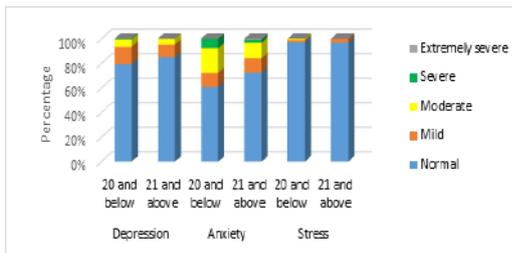


Figure 2. Depression, Anxiety, and Stress by Age

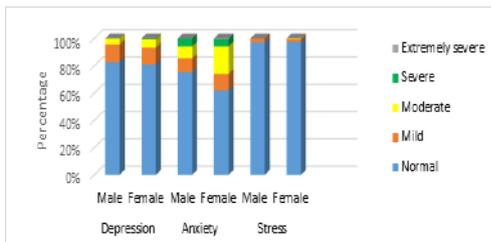


Figure 3. Depression, Anxiety, and Stress by Gender



Figure 4. Depression, Anxiety, and Stress by marital Status

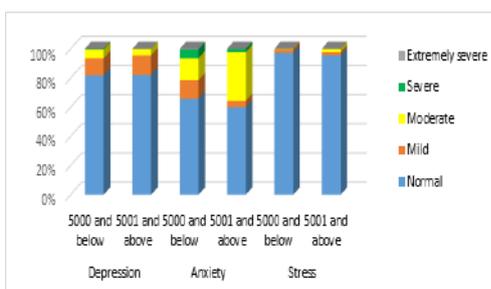


Figure 5. Depression, Anxiety, and Stress by Monthly Income

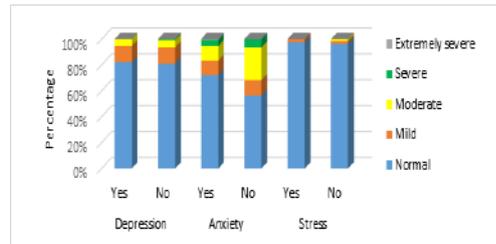


Figure 6. Depression, Anxiety, and Stress by Family History of Illness

of the outbreak on individual populations in order to develop strategies to help reduce symptoms during crisis (Xiong et al., 2020). Thus the present study assessed depression, anxiety, and stress levels in a population of students at a particular epidemic to determine the psychological needs of dealing with the pandemic and potential causal factors.

Methods

Study design

A cross-sectional study was conducted in a sample of 311 tertiary students both in private and government owned higher education institutions in Leyte, Philippines, which were randomly selected.

Instruments

The study used the abbreviated version of the Stress, Anxiety and Depression Scales 21 (DASS21) (González-Rivera et al., 2020) and some socio-demographic information. The DASS consists of a 21-item questionnaire containing three self-reporting measures designed to measure the adverse emotional symptoms of depression, anxiety, and stress. The reliability of the instrument was 0.90 and the total Cronbach's alpha was 0.947 in this study. The item addressed using the 4-point Likert scales that ranged from 0 (A little time or none) to 3 (Most of the time) according to the occurrence and severity of symptoms during the last week. Every scale has seven items, and it measures its total score with the number of the items belonging to that scale. A higher score points to higher symptoms. Moreover, the DASS-21 contained cut-offs based on the results of various categories (standard, mild, moderate, serious and extremely severe).

Data collection

Data were collected from April through June 2020 following requirement of the university's mandate of output during the period of total lockdown. The data compilation was done using online questionnaires through the platform of Google Forms, and the respondents were recruited via social media. Moreover, respondents were told not to place any personal details on the scale to preserve hostility. The order of questionnaires presented were randomized. Students were recruited through the help of faculty members which redirected students to online survey. The survey took to complete for

**Table 2.** T- test Analysis for DASS and Socio-demographic Characteristics of Students.

Characteristics	Category	n	Depression			Anxiety			Stress		
			Mean	SD	p	Mean	SD	p	Mean	SD	p
Age	≤ 20 years	184	1.29	0.608	0.151	1.74	1.03	0.028*	1.04	0.242	0.794
	≥ 21 years	127	1.20	0.505		1.50	0.881		1.03	0.175	
Gender	Male	69	1.22	0.511	0.581	1.45	0.883	0.043*	1.03	0.169	0.782
	Female	242	1.26	0.585		1.70	0.995		1.04	0.229	
Marital status	Single	302	1.25	0.573	0.879	1.66	0.984	0.001**	1.04	0.220	0.309
	Married	9	1.22	0.441		1.11	0.333		1.00	0.000	
Family income	≤ 5000	266	1.25	0.575	0.840	1.62	0.972	0.329	1.03	0.192	0.473
	≥ 5001	45	1.27	0.539		1.78	0.997		1.07	0.330	
Family history of illness	Yes	169	1.24	0.551	0.782	1.50	0.914	0.005**	1.02	0.152	0.323
	No	142	1.26	0.592		1.82	1.02		1.05	0.275	

\*\* $p < 0.01$  and \* $p < 0.05$

**Table 3.** Associations between Depression, Anxiety and Stress and Socio-demographic Variables.

Category		Depression		Anxiety		Stress	
		X <sup>2</sup>	p	X <sup>2</sup>	p	X <sup>2</sup>	p
Age	≤ 20	2.38	0.498	7.90	0.095	2.15	0.341
	≥ 21						
Gender	Male	0.638	0.888	5.99	0.200	0.736	0.692
	Female						
Marital status	Single	1.27	0.735	3.00	0.559	0.276	0.871
	Married						
Family monthly income	≤ 5000	1.57	0.667	10.98	0.027*	2.05	0.358
	≥ 5001						
Family history of illness	Yes	1.21	0.751	12.91	0.012*	2.41	0.299
	No						

\*\* $p < 0.01$  and \* $p < 0.05$

about 15 minutes.

### Data analysis

Data entry and analysis were done using SPSS version 22. Descriptive statistics such as frequency count, percentages, means and standard deviations were used. Data analysis was performed using t-test and Chi square test with a p-value of  $< 0.05$  was considered statistically significant.

### Ethical consideration

This study has approved by Health Commission Ethics St. Paul University with number HA-2020-02.

### Results

Majority of the respondents had a monthly family gross income of P5, 000 and below (265, 85.2%), predominantly females (242, 77.8 %), belonged to the age group of 20 and below (184, 59.2 %) and a family with history of illness (169, 54.3%) (Table 1).

Figure 1 summarized the respondents' distribution according to the levels of severity indicated on the DAS scale. In this study, a total of

311 students took part. Depression, anxiety, and stress were found in 18.6 %, 35.1 %, and 2.85 % of the students. Moderate to extremely severe symptoms of disorder in 6.1 %, 23.5 %, and 0.6 % of the sample were shown, respectively. Moreover, in the midst of this pandemic threat, respondents believed that their mental health was in normal condition (81.4 %, depression; 65.0 %, anxiety; and 97.1 %, stress).

The respondents with symptoms of disorder were analysed for all the demographic characteristics. For younger respondents aged 20 and below, the rate of depression, anxiety, and stress was higher (12.6 %, 23.2 %, and 1.6 %) than for the older group aged 21 and above (6.1 %, 11.6 % and 1.3 %). The younger group were 5.7 %, and 11.6 % more likely to have mild to extremely severe depression and anxiety than the older group, respectively. Conversely, older group was 0.44 % more likely to have mild to moderate stress than the younger group (Figure 2). This was also indicated by the disorder mean scores of 6.02, 6.58, and 6.22 for the younger group and the older group 5.25, 5.61, and 5.50 for the older group, respectively. The mean score difference in anxiety was found to be significant ( $p = .028$ ) (Table

2). This means that younger respondents were more anxious than older respondents. In addition, age does not relate to mental health disorder during this pandemic period ( $p > 0.05$ ) (Table 3).

Figure 3 reveals that the symptoms of disorder for females (14.7 %, 29.6 %, and 2.2%) was higher than for males (3.9 %, 5.5 % and 0.70 %). Females had 10.8 %, 24.1 % and 1.5 % more symptoms of mild to extremely severe depression, anxiety and stress than males. This was also shown in the mean scores in disorder for females (5.91, 6.45, and 6.06) and males (5.00, 5.28, and 5.45). The difference in mean scores in anxiety was found to be significant ( $p = .043$ ). This implies that females experienced more anxiety than males (Table 2). The results of the analysis also revealed that stress does not relate to gender (Table 3).

Depression, anxiety and stress was higher for singles (18.0 %, 34.8 % and 2.9 %) than married ones (0.6 %, 0.3 % and 0.0%). Singles were more depressed, anxious and under stress than married ones (Figure 4). However, the mean score in anxiety and stress for singles (6.22, and 5.95) were higher than married ones (5.11) yet, the mean score for depression was higher for married (6.22) than singles (5.69). The difference in mean scores of the respondents in anxiety was found to be significant ( $p = .001$ ). This indicates that singles displayed more symptoms of anxiety than married ones (Table 2). Further analysis found no association on marital status, in the mental health of the respondents,  $p > 0.05$  (Table 3).

Figure 5 illustrates the mental health disorder among respondents for families of different monthly income. Results showed that respondents from the lower monthly income families (15.4 %, 29.2 % and 2.2 %) had the highest symptoms of the disorder as compared to other group (3.2 %, 5.7 % and 0.70). On the other hand, the mean score in the depression, anxiety and stress for respondents with high monthly income families (6.04, 6.40, and 6.38) were higher than respondents with low-income families (5.65, 6.15 and 5.85). The difference in mean scores of the disorder was not found to be significant ( $p > .05$ ) (Table 2). Further, analysis also revealed that levels of anxiety was associated with family monthly income ( $X^2 = 10.98$ ;  $p = 0.027$ ) but not for depression and stress. This means that the higher the families monthly income, the more anxious the person (Table 2).

Depression, anxiety and stress rates were higher among respondents with no history of family illness than those with families with history of illness. Respondents with no history of family illness were 1.3 %, 21.8 % and 1.2 % more likely to have mild to extremely severe depression, anxiety, and stress than the other group, respectively (Figure 6). Similarly, the mean score in depression, anxiety and stress for respondents of families with no history of illness (5.83, 6.75, and 6.17) were higher than respondents of families with history of illness (5.61, 5.71, and 5.72). The difference in mean scores of the

respondents in anxiety was found to be significant ( $p = .005$ ) (Table 2). This implies that those families with no history of illness were more likely to experience anxiety than their counterparts. Also, findings of the study have shown a significant association between history of family illness and anxiety ( $X^2 = 12.91$ ;  $p = 0.012$ ) but not for depression and stress (Table 2).

In summary, age, gender, marital status and history of family illness are the characteristics that showed a significant difference in the level of anxiety. The younger age group 20 and under, females, singles and with no family history of illness displayed high level of anxiety than the other groups (Table 2). Moreover, family monthly income and history of illness are the variables associated with anxiety. Finally, the variables, which are used in regression explained only 1.5 % of depression, 3.4 % of anxiety and 1.4 % of stress (Table 3).

## Discussion

The research is aimed at determining the depression, anxiety and stress level of the tertiary students enrolled at either private or public higher education institution in Leyte, Philippines. In the sample, moderate to extremely severe depression, anxiety, and stress levels were lower than in other studies (C. Wang et al., 2020). This is due to the subsequent reasons. First, data collection has been carried out before the Enhanced Community Quarantine (ECQ) and second, more information about the virus has been obtained since the first recorded case in the Philippines was one month after China, and three months later, the first local transmission in the country was confirmed. Such awareness may explain the lower rates of depression, anxiety and stress.

As far as age differences on depression, anxiety and stress were concerned, there were significant higher levels of depression, anxiety and stress in the 20 and below age bracket than in the 21 and above age bracket. These symptoms may have been due to the additional stress experienced by young students during the need to adapt to the new online educational environment, without face-to-face classes (Ivanov & Dolgui, 2020). Thus, if these young people still find themselves vulnerable to mental disorders, education institutions must put in place prevention and intervention services to relieve tension (Boccaletti et al., 2020). This finding is similar to the study which found age group 18-25 year age bracket had higher mean levels of stress, anxiety and depression followed by the age bracket 26-60 year bracket (Choi, 2020). However, it contradicts with previous findings that psychiatric disorder is more prevalent in adults aged 41-55 years compared to other adult age groups (Griffith et al., 2019).

The study also found that gender was not related to depression, anxiety and stress. The depression, anxiety and stress rate for females are significantly higher than for males. This is consistent

with the previous findings that women during the pandemics are more prone to mental health (Acob, 2020a). Women may be more concerned with social and economic effects of the pandemic being the traditional caregiver in the family (Grubic et al., 2020). Similarly, according to a study of the American College Health Association (2019), using CIDI and MDQ inventories, it was found that 26.5% of women and 20.8% of men had psychiatric disorders, anxiety disorder (19.4% vs 12%), and mood disorders. Other studies reported that common mental disorders are more common in women than in men in other countries (Chew et al., 2004). This difference can be attributed to socioeconomic disadvantage, cultural constraints, and violence. Women are more likely to express mental health problems than men. Evidence suggests the role of sex hormones in such gender differences.

In this study, age, gender, marital status, and history of family illness showed a significant difference in the level of anxiety. The younger group age 20 and below, females, single, and families with no history of illness were more anxious than those other groups. Moreover, family monthly income and history of illness were associated with the level of anxiety of the respondents. In general, the variables, which are used explained only 1.5 % of depression, 3.4 % of anxiety and 1.4 % of stress.

In short in this situation of unprecedented confinement for the Filipino students, it is highly important to deal with psychological factors. Most of the student-respondents exhibited a typical mental health disorder. This may mean that the students were still manifesting a strong and optimistic outlook in life in the midst of this pandemic problem. It doesn't automatically mean they don't experience any depression, anxiety or stress, but they have only decided to project hope and end this national disaster. This finding is contrary to previous study that college students encountered amplified negative emotions as several universities agreed to cancel face-to-face classes and relocate students in response to the increasing COVID-19 concerns (Choi, 2020). The same findings contradicted the result of this study in which college students felt uncomfortable due to confusion and sudden end of classes, in addition to the anxiety of closing schools. As more colleges move into distant learning after the spring break, due to the change in academic routine some students experienced poor mental health. Therefore, disruptions of their tasks and activities putting a risk in their program of study, postponed completion and hinder ability to find a job, consequently fuel insecurity among college students (H. Wang et al., 2009).

The same idea suggested that employment, education and gender affected signs of anxiety and depression that developed through this pandemic. Highlighted depressive disorders and anxiety are more usual in females, and it is expected that females will be more affected during pandemics (Acob, 2020b).

## Limitations

While the work has made a major contribution to the psychological effects in COVID-19 and can be used by government, school administrators or other organizations, the study still shows some limitations. The survey was conducted online and is only available for students with internet access and excludes large parts of the population from participating.

## Conclusion

In conclusion, it was found that students had mild to moderate levels of stress; mild to severe levels of depression and anxiety while most of them has normal levels of depression and stress. The majority of students do not suffer from stress; however there was a significant association between gender and the presence of stress levels. Finally, the students do not suffer from stress and also no associations were found regarding age, sex, marital status, and family monthly income. Moreover, it is necessary to develop community-based mental health programs. Further studies must be conducted on larger sample size and by selecting more sample in groups and include other possible factors such as social media, regular stress, and social skills that could also have a main effect rates of depression, anxiety and stress.

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## Conflict of interest

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# Demographic Profile, Knowledge, Attitude, and Practices of Blood Donors in a Low-Middle Income Country

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## Abstract

**Background:** Demographic profile, knowledge, attitude and practices (KAP) of blood donors in a low-middle income setting was investigated in this study. The study determined the demographic profile of blood donors in terms of sex, age, ethnicity and level of education and measured the level of knowledge, attitude and practices in terms of blood donation.

**Purpose:** The relationship of the donor profiles in terms of level of knowledge, attitude and practices was also determined.

**Methods:** It utilized a cross-sectional study design which was conducted from February-October 2020. A self-administered questionnaire was distributed to the volunteers of blood donors of a non-institution-based blood bank establishment in Baguio City. Descriptive statistics and Chi-square were used to analyze the data. Ethical clearance was obtained and was approved.

**Results:** The results revealed that the majority of the respondents were female (59.2%) with age ranged from 18–30 years old (75.3%) and in collegiate level (83.2%). Majority of the respondents' ethnicities were Tagalog (25.9%). Study revealed that respondents have a high level of knowledge in relation to blood donation, the attitude of the respondents revealed that blood donor had strong agreement to positive statements and disagreement to negative statements. Most of the respondents donated in the past, 62.3% are lapsed donors, 18% were first time donors and the majority had an intention to donate in the future.

**Conclusion:** In terms of relationship of Demographic Profile to KAP, only Practices revealed a significant relationship to sex, age, ethnicity and level of education with P value ranging from 0.05- <0.0001.

**Keywords:** Attitude; blood donors; knowledge; low-middle income country; practices

## Introduction

Voluntary blood donation is the response to the demands of blood transfusion services in the healthcare system as recommended by international authorities; WHO, ISBT and Council of Europe. The sustainability and safety of national blood supplies rely on the recruitment and retention of non-remunerated blood donation and "low risk" donors instead of replacement and paid donors. By 2020, WHO had a goal to eliminate paid donation and promote 100% voluntary and non-remunerated blood donation across the world. WHO global framework for action had recommended 20 strategies in its attempt to address the barriers on voluntary donation (WHO, 2010). A global effort was dedicated to formulating national blood systems among low- and middle-income countries (LMICs) to ensure the availability and safety of blood supply (Ifland, 2014). One of the WHO recommendations is the undertaking of knowledge, attitudes and practices in the local environment to understand the behaviors regarding blood donation and predict future blood donations (WHO, 2010).

Among LMICs, the access to safe blood products is lifesaving treatment and management of; congenital blood disorders, anemia caused by malaria,

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trauma, reduction of maternal mortality from complications such as hemorrhage during childbirth and road traffic accidents (WHO, 2010). However, recruitment of low-risk donors in developing countries is a challenging feat. In sub-Saharan Africa (SSA) and in the South East Asia region (SEAR), there is still prevalence of replacement of blood by family and friends which have higher risk for blood borne infections and paid donor system.

The problem of decreasing frequency of blood donors impact the availability of blood which may be due to the following prevailing misinformation, low awareness and poor knowledge, unfavorable attitude regarding blood donation, low practice mainly due to the lack and accessibility of infrastructure (Melku et al., 2018; W. Tadesse, Ayalew, Yisma, Liben, & Wudu, 2018), time constraints from work and studies, paperwork, questioning, eligibility requirements (Charbonneau, Cloutier, & Carrier, 2016), failure to make positive attitudes to actual blood donation (Lownik et al., 2012; van Dongen, 2015) and the advent of increasing understanding of blood transmissible diseases resulted to a stricter deferral criteria which the current pool of blood donors (Schnaubelt & Nadder, 2010).

The blood collection centers must regularly monitor the patterns of blood donors and donation behaviors to be able to direct their donor management practices (Veldhuizen, 2013). Unfortunately, lapses in blood donation happen after the fifth donation. Lapsing donors are those who "donated at least once within the last 24 months, but not in the last 12 months" (Veldhuizen, 2013). Lapses happen due to changes in residency, lifestyle-related deferral, the lack of personal request to donate (Misje, Bosnes, & Heier, 2008), physical reaction and busy lifestyle (van Dongen, 2013), and medical deferral reasons (Moog, 2009).

This study focused on donor retention, defined by European blood services providers as the prevention of donors from lapsing from donating blood and becoming inactive. The goal among blood establishments is that first time donors would become regular donors. Regular donors are "those who made at least two donations within the last 24 months". Regular donors can ensure the adequate blood supply in the future while also participating to motivate other people to donate blood. Hence, KAP survey among the current donors may fill in the knowledge gap on how to convert them as committed blood donors (Ringwald, Zimmermann, & Eckstein, 2010)

There are still gaps on data regarding 1) donor retention 2) lack of focus among first time, repeat and lapsed donors, 3) most of the samples were college undergraduates thus the results may not be generalizable (Godin, Vézina-Im, Bélanger-Gravel, & Amireault, 2012; Bagot, Murray & Masser, 2016; van Dongen, 2015). The findings of the research is useful in understanding the donors to be able to formulate a responsive donor recruitment and retention strategy and long term donor management

(Satake, 2016; Veldhuizen, Doggen, Atsma, & Kort, 2009; World Health Organization, 2017).

In response to global guidelines on the provision of blood, the Philippine government has enacted Republic Act no. 7719, National Blood Services Act of 1994 which implements the National Voluntary Blood Services Program which promotes voluntary blood donation to meet the needs of Filipino patients for available and safe blood products (Republic Act No. 7719, 1994). Despite the organization of blood donation programs among developing countries, there are still shortages of blood products.

Baguio City is an urbanized city in the middle of the mountain ranges of Cordillera Administrative Region (CAR), which is 240 km away from Manila, the capital of the Philippines. It is the center of commerce, tourism and education within the region (Estoque & Murayama, 2011). As of the 2015 census of Philippine Statistics Authority, 345,000 is the estimated population in the city (PSA, 2010; n.d., 1994). Based on the census in 2010, it is shown that 51.2% of the population are female and 48.8% comprise the males. The median age of the population is 24.4 years (Philippine Statistics Authority (PSA), 2010; n.d., 1994). Baguio City's population consists of different native groups which are Igorots, Ilocano, Pangasinenses, Tagalogs and Kapampangans (Estoque & Murayama, 2011) According to the Philippine Red Cross (PRC)-Baguio City Chapter data in 2018, 6812 of the population has been the donors which is only about 2% of the population (PRC, 2017).

It is problematic to generalize the results from other blood donor studies because the city has a unique demographic pattern which consists of young people and changes are influenced by the city's rapid urbanization (Estoque & Murayama, 2011). Change in the environmental landscape affects the maintenance of the donor blood pool (Unnikrishnan et al., 2011). Young and female donors have increased chances of lapsing in blood donation (van Dongen, 2015) which is usually the case in the city of Baguio. Another problem which contributes to challenges in donor selection is the increasing number of HIV cases in the city, as of 1984 to January 2018 with 281 cases (Department of Health, 2018) thus, the need for retaining healthy blood donors. Studying the knowledge, attitude and practice of regular and lapsed donors would give an overview about the current donors of the city that can assist in filling the gaps in terms of donor profiles information. Hence, it can assist in formulating appropriate strategies to ensure the adequate blood supply in the city. This study determines the following: The profile of blood donors in Baguio City in terms of sex, age, ethnicity, level of education in Baguio City; the level of the knowledge of blood donors in terms of blood donation; the attitudes of blood donor respondents in terms of blood donation and the practices of blood donor respondents in terms of blood donation.

Knowledge, attitude and practice (KAP)

research is recommended by WHO (2010) to produce essential data for demonstrating present donor recruitment and retention strategies. The study is important among Blood Bank Institutions since the result would serve as a base-line data and identification of behavioral patterns useful in crafting health communication strategies. Policy makers may utilize this evidence-based research in blood donation policy development.

The research's respondents are from PRC-Baguio City data base. The KAP Survey was conducted from February to October 2020.

## Methods

The study utilized a cross-sectional study design, conducted from February -October 2020. A self-administered questionnaire was distributed to the volunteering blood donors of 17-70 years old at a non-institution-based blood collection establishment in Baguio City after a successful blood donation. The data was collected through a validated and pre-tested questionnaire. It was analyzed using SPSS and presented using tables. Ethical clearance was obtained from the SLU Research Ethics Committee See. The estimated population size in 2019 was 1,793. The sample size was calculated using Epi

info version 7.2.2.2, at 95% confidence interval which was 316. The study was conducted at Philippine Red Cross (PRC)-Baguio City Chapter in Baguio City, Benguet Province, Philippines. It is a non-institution-based blood service facility that provides the following programs; donor recruitment and retention, blood collection, blood component processing and blood storage and issuance. The self-administered guided questionnaire was prepared in English and Filipino. The data collection instrument was adapted from the studies of Gebresilase, Fite, & Abeya (2017), Melku et al (2018) and Das et al (2014) for evaluating KAP of blood donors and the tool was designed to collect donor demographic profile (sex, age, ethnicity, level of education), level of knowledge, attitude and practices. The questionnaire was pre-tested and validated before data collection, reliability and validity were carried out. Data was coded, checked, and analyzed in SPSS version 20.0. Appropriate inferential and descriptive statistics were used to process the data. Percentages were used to analyze the profile of blood donors and level of knowledge. The Attitude of blood donors were analyzed through mean and standard deviation. The relationship of knowledge, attitude and practices with the demographic profiles were calculated using Chi-square with the

**Table 1.** The Profile of Blood Donors in Baguio City (n=316)

Profile of Blood Donors	Categories	%
Sex	Male	40.8
	Female	59.2
Age (Year)	18–30 years old	75.3
	31–40 years old	10.4
	41–50 years old	8.5
	Above 50 years old	5.7
Education	Elementary	3.5
	High school	8.2
	Senior high level and Technical Vocation	3.8
	College level	83.2
	Masters and PhD	1.6
Ethnicity	Igorot	14.2
	Ifugao	2.2
	Kalinga	3.2
	Kankana-eyes	14.2
	Ibaloi	5.4
	Ilocano	24.4
	Pangasinense	3.8
	Tagalog	25.9
	Kapampangan	2.8
	Others	3.8
Donation Status	First time donor	18
	Lapsed donor	62.3
	Regular donor	19.6

significance level at  $p$  value  $< 0.05$ . The results were presented in texts and tables.

## Results

### Profile of Blood Donors in Baguio City

Profile of blood donors in Baguio City based on sex, age (year), education, ethnicity and donation status were summarized in Table 1. Among the 316 blood donor respondents, the majority of blood donors were women (59.2%), the highest donation rate was from the age group of 18-30 years (75.3%) from the group of college level education (83.2%). Based on ethnicity, 25.9% were Tagalogs, 24.4% were Ilocanos, 14.2% were Igorots and Kankana-eyes.

### Attitude of Blood Donors in Relation to Blood Donation

Attitude of blood donors in relation to blood donation is shown in Table 3. The questions in relation to attitude towards blood donation included five positive and five negative attitude statements. The questions were based on altruism, willingness to be a voluntary and regular donor, receiving incentives for donation and blood donation experience. The blood donor respondents exhibited strong agreement to positive attitude statements which are

the following: young people should donate more frequently compared to old people, the best way to donate is through voluntary donation, willingness to become a regular donor and donating blood is a good experience, agreeing that donating blood is one self's moral duty. While the blood respondents disagreed among the negative attitude statements; people who donate blood should receive something in exchange, donors are temporarily weakened, donors can contract diseases, donating done to get free screening tests and the best way to donate is at the request of relatives. The blood donor respondents showed a favorable attitude.

### Practices of Blood Donors in Relation to Blood Donation

Practices of Blood Donors in Relation to Blood Donation were measured through the history of donation, intention to donate in the future and donation status (first time, regular and lapsed donor). Results in Table 4 revealed that for the history of donation, 29.4% (57) donated more than three times, 27.8% (88) donated two to three times, 24.7% (78) donated once and 18% (57) had never donated before. The results on intention to donate in the future showed that 34.8% of the respondents intended to donate every 3 months, 25.6% intended to donate every 6 months while 7.3% would only donate when asked for. According to the responses

**Table 2.** Level of Knowledge of Blood Donors on Blood Donation

Knowledge	Correct Response (%)	Interpretation
Donor Eligibility	76.90–95.90	Very High
Blood Typing	74.40–91.90	Very High
Blood Testing	78.80–94.90	Very High
Mean	84.40	Very high

**Table 3.** Attitude of Blood Donors in Relation to Blood Donation

Attitude of Blood Donors	Mean	Std. Deviation	Interpretation
<b>Positive Attitude on Blood Donation</b>			
I donate blood because it is my moral duty.	3.1013	0.79833	Agree
I think people who donate blood should receive something in exchange	1.8196	0.74048	Disagree
I think people who donate blood are temporarily weakened	2.1709	0.59301	Disagree
I think young people should frequently donate blood compared to old people	3.3133	0.80865	Strongly Agree
I think the best way to donate blood is through voluntary donation	3.7057	0.54519	Strongly Agree
<b>Negative Attitude on Blood Donation</b>			
I think people who donate can contract diseases	2.0411	0.49269	Disagree
I donate blood to get free screening tests	1.962	0.75075	Disagree
I am willing to become a regular donor	3.7057	0.52138	Strongly Agree
In my opinion the best way to donate blood is at the request of relatives	2.0538	0.50422	Disagree
I think donating blood is a good experience	3.8196	0.45327	Strongly Agree

**Table 4.** Practices of Blood Donors in Relation to Blood Donation

History of blood donation	n	%
Never donated	57	18
Donated Once	78	24.7
2–3 Times	88	27.8
More than 3 times	93	29.4
How often do you intend to donate?		
Every 3 months	110	34.8
Every 6 months	81	25.6
Once a year	42	13.3
Only when asked for	23	7.3
N/A	60	19
Donation Status		
First time donor (No history of donation)	57	18
Regular donor (Donated blood twice within the last 2 years)	62	19.6
Lapsed Donor (Donated at least once within the last 24 months, but did not donate in the last 12 months)	197	62.3

on donation status, 62.3% were lapsed donors, 19.6% were regular donors and 18% were first time blood donors. The study also revealed that most of the respondents have a previous history of donation, only 18% had not donated in the past or first-time donors while the majority were lapsed donors.

### Relationship of Demographic Profile of Blood Donors to Knowledge, Attitude and Practices on Blood Donation

Relationship of Demographic Profile of Blood Donors to Knowledge, Attitude and Practices on Blood Donation were analyzed using Chi square test of association at P value = 0.05 level of significance (Table 5). Results revealed that Practices of Blood Donors in terms of History of Blood donation (P value = <0.001) Frequency of future blood donation (P value = .001) and Donation Status (P value = <0.001) has significant relationship to sex of blood donors. Frequency of future blood donation has significant relationship to Age of the blood donors (P value = 0.016), Ethnicity has significant relationship to Donation status of blood donors (P value = 0.006) and Level of Education has significant relationship to History of blood donation (P value = 0.050). Knowledge and Attitude shows no significant relationship to the Demographic profile of the blood donors.

## Discussion

The demographic profile was similar to the changing demographic landscape of Baguio City as reflected in the 2015 Census where the number of women was slightly higher than men, the median age in the city was young individuals around 24 years old who were college students and the major ethnicities were represented in the study (Estoque & Murayama, 2011). In contrast to the Global Status Report on

Blood Safety and Availability by WHO (2017), a survey from 118 countries showed otherwise– only 30% were the female donors wherein the lowest donation rate of female donors was in the Eastern Mediterranean region and the highest number of female donors was in the America and second was the South East Asia (WHO, 2017), the same is true with the studies of Veldhuizen et. al (2009). The same report noted that among developing countries, the age group of donors were below 18 years old while 18-24 years old were the age group that usually donated among high income and upper middle-income countries. Globally, especially in developing countries, young people account for the majority of the blood donors (WHO, 2017). Over the course of the study, the ethnic groups that were recorded were the following; Igorot, Ifugao, Kalinga, Kankana-eyes, Ibaloi, Ilocano, Pangasinense, Tagalog, Kapampangans, Bisaya, Bontoc, Bicolano, Cagayanon, Applai, Indian, Ibaneg, Chinese and Isneg. The ethnicities reflected the rich cultural diversity in the city. These diverse groups were an assembly of potential new donors who can be converted to regular donors. On the downside, the under-represented groups may require rare blood types which may not be found among the blood banks in the city. Recruitment and retention from minor ethnic group blood donors is still a challenge among blood donation facilities in Australia, Canada, Europe and the United States (Blacks and Hispanics) (van Dongen, Mews, Kort, & Wagenmans, 2016; Patel et al., 2019).

Level of Knowledge of Blood Donors on Blood Donation in this research revealed a very high knowledge which was the same with the study done by Lownik et al. (2012). Lownik et al. (2012) summarized 18 KAP studies from developing countries, the countries showed commendable level of knowledge regarding the blood uses, testing the

**Table 5.** Relationship of Demographic Profile of Blood Donors to Knowledge, Attitude and Practices on Blood Donation

Variable	Knowledge (P value)	Positive attitude (P value)	Negative attitude (P value)	History of blood donation (P value)	Frequency of future blood donation (P value)	Donation Status (P value)
Sex	0.334	0.810	0.113	<0.001	<0.001	<0.001
Age	0.247	0.225	0.954	0.299	0.016	0.267
Ethnicity	0.431	0.091	0.577	0.798	0.676	0.006
Level of Education	0.302	0.927	0.567	0.050	0.463	0.156

*P value =0.05 level of significance*

types of donors however low the knowledge on the requirements to be an eligible donor is. The respondents of the current study were already donors which would have contributed to a high level of knowledge. Among the questions in the current study, the common misconception is that blood could not transmit infections which is in contrast to the results of KAP studies in developing countries showing that respondents are fearing the risk of contracting infections (Lownik et al., 2012). Based on five KAP studies targeting university students, the systemic review showed high awareness based on their overall scores in the assessment (De Los Santos & Firmo, 2019). This is very promising because good knowledge increases the willingness to be a regular donor (Lownik et al., 2012).

The favorable attitude on blood donation is a common result of KAP studies from developing countries and there is no study yet that recorded a negative attitude on blood donation. However, certain populations from Tanzania, Nigeria, Bangladesh, and South Africa are not willing to donate (Lownik et al., 2012). On Attitude of Blood Donors, in the systematic review of De Los Santos and Firmo (2019), most university students of five research studies have favorable attitudes regarding blood donation. The literature agrees that university students affirm that blood donation is an act in helping others, it must be voluntary, incentives and rewards are unnecessary, and there is willingness to be donors also in medical emergencies. The favorable result of prevalent positive attitude increases the likelihood of first-time donors returning.

Furthermore, the same study showed in terms of practices. The factors which increased the likelihood of first-time donors to donate again were favorable attitude, donation as being under a person's control, importance placed on being a blood donor and confidence in the ability to donate despite being given incentives (Bagot, Murray & Masser, 2016). The most common deterrent to blood donation among developing countries was fear; fear of pain (China), fear of needles (Thailand, Bangladesh and Trinidad and Tobago) and fear of being infected with HIV (Nigeria and Tanzania), infertility and hepatitis (Iran) (Lownik et al., 2012). Based on the 18 KAP studies from developing countries, the number of

previous donors varies depending on their target population. KAP studies from Brazil, Burkina Faso, Nigeria targeted previous blood donors. While in studies which targeted the general population, the percentages showed the blood donors who donated in the past; China (27.6%), Iran (37.9%), Haiti (6.1%) and Molva (42%) (Lownik et al., 2012). WHO (2017) recorded that Europe had 85% repeat voluntary donors while Western Pacific had 48% and South East Asia had 47% while the lowest recorded were in the Americas (19%). De Los Santos and Firmo (2019) reviewed five KAP studies in relation to university students, results noted low actual donation among university students. The results were encouraging because they were intending to practice blood donation in the near future despite the current Covid-19 pandemic situation. Though they intend to donate every 3 months or annually, this result intensifies the need for strategies on retaining these donors and converting the first-time donors to become regular donors. In the context of donor retention, van Dongen (2015) states that females, young people and minorities are prone to lapse in blood donation, this may explain the high number of lapsed donations in the city since university students who were blood donors may not donate again because of the following reasons; contacting them is difficult, students who donated due to peer pressure have lower chances on donating again once they have been removed from that environment and mobile blood drives among schools may be crowded which increases the chances of adverse reactions such as fainting and nausea which decreases the willingness to donate (Lownik et al., 2012). Furthermore, reasons for lapsing may be due to changes in residency of college students after graduation, no one is asking them to donate, lifestyle-related and medical reasons (Misje, Bosnes, & Heier, 2008; Moog, 2009; van Dongen, 2013).

On the Relationship of the Profile of the Blood Donors to the KAP on Blood Donation, this research revealed that only practices revealed a significant relationship with gender, age, ethnicity and level of education, neither knowledge and attitude showed the same relationship.

## Conclusion

The results in the demographic profile of blood donor respondents are similar to the unique demographic landscape in Baguio City. The majority was women (59.2%), the highest donation rate was from the 18-30 years old age group (75.3%) and college level educated (83.2%). Based on ethnicity, 25.9% were Tagalogs, 24.4% were Ilocanos, 14.2% were Igorots and Kankana-eyes. The blood donor respondents had a very high level of knowledge on most facts about blood donation, donor eligibility, blood typing and testing. The blood donor respondents had a favorable attitude on statements regarding altruism, willingness to be a volunteer and regular donor, receiving incentives for donation and blood donation experience. For practices, the history of blood donation revealed that the majority of donors have donated before and only 18% are first-time donors. The majority of them showed intention to donate in the future and the majority are lapsed blood donors. Sustaining the availability of safe blood supply is of utmost importance especially during pressures of rapid urbanization in the city and social pressures exacerbated by the COVID-19. Though the results of the KAP survey may vary based on context, the results showed increased intention to donate in the future as reflected in the knowledge, attitude and practices. Therefore, this reveals that retaining this donor pool using retention strategies is actually a need right now as a response to the fluctuating blood supply. The results of the survey could be used by blood bank facilities in crafting targeted retention strategies to build a safe and reliable blood system. Practices revealed a significant relationship with gender, age, ethnicity and level of education, neither Knowledge and Attitude showed the same relationship.

## Recommendations

Design a communication strategy campaign based on the current profile of blood donors in the city (use of specific dialects) to widen the reach of potential donors in order to convert negative attitude on blood donation to positive attitude; Collaborations with the local government units, public and private organization are needed to maintain a stream of blood donations and offer this evidence-based research in crafting donor retention program policy; Explore the other facets of retention strategies in Baguio City such as studying medical deferral, anxiety and stress, failing to plan for donation as barriers of retaining donors may be studied further; Explore the use of electronic communication and telecommunication models to help track blood donors and achieve retention strategies; Consider and explore other profile in associating KAP such as income and marital status.

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# Severity Level and Quality of Life of Post-Acute Coronary Syndrome Patients

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## Abstract

**Background:** Severity level is one of the variables used to determine the treatments of acute coronary syndrome patients. There are many ways to see the success of treatment such as measuring the patient's quality of life.

**Purpose:** This study aims to determine the correlation between severity level and quality of life among patients with post-acute coronary syndrome at Hasan Sadikin Central Hospital Bandung.

**Methods:** This research was a quantitative study with a descriptive-analytic approach. Sampling of 100 patients with post-acute coronary syndrome patients was collected during a period of one month using consecutive sampling technique. The severity was assessed based on the stenosis number and the quality of life data were collected using the MacNew QLMI. Somers'd Gamma was used to analyze the data.

**Results:** Data showed that most of the patients had angina without stenosis (36%) and coronary 1 stenosis (29%). The results of the quality of life measurement show that 58% patients have a good quality of life, 64% are good in the emotional domain, 52% are good in the physical domain, and 60% are good in the social domain. Bivariate analysis (CI 95%) showed that there was a significant correlation between severity level and quality of life (p-value 0.033), as well as with the physical domain (p-value 0,008).

**Conclusion:** There is a correlation between severity level and quality of life of post-acute coronary syndrome patients in Hasan Sadikin Central Hospital Bandung. Based on the quality of life domain, the severity level was significantly related to the physical-domain. Regular screening is necessary to improve the quality of life of post-acute coronary syndrome patients.

**Keywords:** post-acute coronary syndrome; quality of life; severity level

## Introduction

Cardiovascular disease is one of illnesses that still causes of high mortality and morbidity rates in the world. Approximately 31% amount of deaths worldwide are caused by cardiovascular disease (Liu et al., 2019). The prevalence of ACS increases rapidly especially in developing countries, for example in Srilanka which is recognized as having one of the highest causes of death worldwide (Medagama, Bandara, Silva, & Galgomuwa, 2015). As much as 65% of deaths occurred when the patients were in pre-hospital phase and did not receive medical care (Beauloye, Vrolix, & Claeys, 2016).

Indonesia is one of the countries with a high case of heart disease. About 2,650,340 people were diagnosed with a heart disease and the number increases every year (Ministry of Health Republic of Indonesia, 2017). One of the provinces in Indonesia, West Java, contributed 514,597 of them (Ministry of Health Republic of Indonesia, 2014). Acute coronary syndrome is a major cardiovascular problem that causes an increase in the number of hospitalization and mortality rate (Irmalita et al., 2015).

The severity of the disease is described according to coronary artery disease categorization. First, Stable Coronary Artery Disease (Stable CAD) refers to angina pectoris syndrome, including the appearance of recurrent chest pain due to lack of oxygen supply to cells (Liu et al., 2019). While

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Unstable Angina is a condition that is associated with prolonged spontaneous attacks where chest pain can occur even during periods of rest. The last one is Myocardial Infarction (MI). It leads to severe and persistent chest pain, typical ECG changes, and an increase in cardiac biomarkers such as troponin (Thygesen et al., 2018).

The impact of Acute Coronary Syndrome on a patient can affect the quality of life. Patients who have undergone percutaneous coronary intervention experience a decrease in quality of life, related to psychological endurance and self-efficacy. Patients with acute coronary syndrome who have comorbidities like diabetes, hypertension, kidney problems, stress, lack of exercise are described as having a lower quality of life (Bahall & Khan, 2018). Patients who survive from an acute coronary syndrome attack have lower quality of life in some domains such as general health, physical, mental, and daily activities compared to the general population (Mollon & Bhattacharjee, 2017).

On the other hand, Kaambwa, Gesesew, and Horsfall (2020) stated that Quality of Life of ACS patients improved after receiving treatments when compared to the baseline status where treatments were not provided. Kaambwa, Gesesew, and Horsfall (2020) also found that patients undergoing PCI experienced a faster improvement in quality of life compared to CABG procedure. According to the data above, it is necessary to do research about the quality of life of patients after acute coronary syndrome.

Specific instruments are needed to evaluate these conditions. There are some tools to assess the quality of life according to patients' conditions and aspects to be measured. For cardiology and heart disease, the instruments used are such as World Health Organization Quality of Life Assessment Instrument (WHO-QoL), Medical Outcomes Study 6-item Short-Form Health Survey (SF-36), MacNew Heart Disease Health-Related Quality of Life Questionnaire (MacNew) and so on (Gierlaszyńska, Pudło, Jaworska, Byrczek-godula, & Gąsior, 2016).

There are factors that affect the quality of life of patients with acute coronary syndrome, especially myocardial infarction. According to a review of articles conducted, Nurhamsyah, Trisyani, and Nuraeni, (2018) found that there were 5 factors, including biological factors; emotional factors; physical factors; social factors; and psychometric factors. Considering that post-acute coronary syndrome is more general and complicated than myocardial infarction, it is possible that patients suffer more symptoms as well as severity. Moreover, because severity is directly related to many factors above (biological factors, physical factors, and emotional factors) so this study is important to do.

Many studies in emergency ACS patients have been conducted. The approach developed to categorize ACS patients in hospitals is still limited to triage that allows for the best and fast therapy, but an approach to patients after they have gone

through an emergency still needs to be done (Crea & Libby, 2017). Quality of life is one indicator for the success of patient care. An extensible quality of life instrument, particularly for patients with established ACS, is called the Macnew QLMI. However, its use in the service setting has not yet been found.

This is a part of research, which examines the factors associated with the quality of life of patients with post-acute coronary syndrome. Based on reviews, the MacNew Heart Disease Health-Related Quality of Life Questionnaire can describe the patient's quality of life in detail because it has 3 domains, namely emotional, physical and social. This study uses correlation because researchers want to see specifically the relationship between severity and quality of life of post-acute coronary syndrome patients. Domains on MacNew seem to be correlated with disease severity variables. This study aim was to determine the correlation between severity and quality of life of post-acute coronary syndrome patients at Hasan Sadikin Central Hospital Bandung.

## Method

This research is a quantitative study with a descriptive-analytic design and a cross-sectional approach. This study was conducted on all outpatients with post-acute coronary syndrome who passed the inclusion research criteria and came to the general cardiac clinic and specialists at Hasan Sadikin Central Hospital Bandung in 2019. The inclusion criteria included: patients younger than 70 years who can communicate well; patients who can read and write; and patients with more than 2 weeks post-treatment.

Sampling technique used in this study was consecutive sampling. 100 respondents were taken from June to July 2019. This study has received ethical clearance from two ethical institutions, namely the ethics committee of Hasan Sadikin Central Hospital Bandung with reference LB.02.01/X.6.5/94/2019, and the research ethics committee of Universitas Padjadjaran with reference 532/UN6.KEP/EC/2019. This research process also got approval from the Director of Hasan Sadikin Central Hospital Bandung with letter number LB.02.01/X.2.2/8348/2019.

The independent variable in this research was severity level of ACS (based on disorders in the heart blood vessels) which were Angina without Significant Stenosis; coronary 1 stenosis, coronary 2 stenosis; coronary 3 stenosis; coronary 4 stenosis; coronary 5 stenosis, and coronary 6 stenosis (Smith et al., 2006). While the dependent variables were quality of life and its domains. Data on quality of life were collected using the MacNew Quality of Life after Myocardial Infarction Questionnaire (MacNew QLMI) which was approved by the instrument developer (Oldridge, Neil, & Lim, 1996). This instrument consists of 27 questions describing conditions related to the quality of life of patients with coronary heart disease. The result of the quality

**Table 1.** Characteristics of Respondents / Demographic Data (n=100)

Characteristics	Quality of life		n (%)
	Good	Poor	
Age (Years)			
17–25 (Teens)	0	1	1
26–45 (Adult)	5	6	11
46–55 (Early elderly)	18	8	26
56–65 (Late elderly)	20	20	40
>65	15	7	22
Gender			
Male	48	24	72
Female	10	18	28
Marital status			
Married	56	41	97
Single	2	1	3
Last Education			
Primary Education (Elementary, Junior High)	20	23	43
Secondary Education (High School/equal)	24	13	37
Tertiary Education (Diploma, Bachelor, Master)	14	6	20
Employment			
Unemployed	17	24	41
Private employees / PNS / POLRI / TNI	21	11	32
Others (Entrepreneurs, Farmers )	20	7	27
Income			
1.000.000-2.900.000 (West Java Minimum Wage)	21	24	45
3.000.000-3.500.000	14	7	21
>3.500.000	23	11	34
Comorbidities (Related to Cardiac)			
Diabetes / Hypertension / Kidney Disease	13	13	26
More than 1 disease	7	10	17
Without comorbidity (Diabetes / Hypertension / Kidney Disease )	38	19	57

of life data can be divided into two categories based on cut off points, which are good and poor (Oldridge, Neil, & Lim, 1996). The validity test conducted by the researcher showed the value of  $r$  count  $> r$  table (0.196) on all question items ( $r$  count P1-P27: 0.486-0.799). The instrument is also declared reliable with Chronbach's alpha value of 0.937. It means that every single question in this questionnaire is valid and reliable.

Researchers conducted univariate and bivariate analyses in this study. The univariate analysis conducted by researchers includes the characteristics of each variable. The bivariate analysis used was Somers'd Gamma to assure the relation between independent and dependent variables. The Somers'd Gamma test was chosen because the scale of data on severity and quality of life is an ordinal scale.

## Results

Based on [table 1](#), the respondent characteristics can be seen. 40 respondents (40%) were 56-65 years old or in the final elderly stage. The most of respondents' gender (72%) were male and the marital status was married (97%). The most recent level of education taken by respondents was mostly at the basic education level, which were accounted for 43 respondents (43%). The majority of the respondents' indigenous tribes were Sundanese with 86 people (86%). The respondents' employment status was mostly unemployed (41%) and as many as 45 respondents (45%) had monthly income under the minimum wage of West Java province (Rp. 1,000,000-Rp. 2,900,000). On average, there were 57 respondents (57%) who did not have other comorbidities.

Based on [table 2](#), it can be seen that more

**Table 2.** Characteristics of Variables (n=100)

Characteristics	Quality of Life		n (%)
	Good	Poor	
Good			58
Poor			42
Emotional Domain			
Good	55	9	64
Poor	3	33	36
Physical Domain			
Good	50	2	52
Poor	8	40	48
Social Domain			
Good	52	8	60
Poor	6	34	40
Severity Level			
Angina without Significant Stenosis	15	21	36
Coronary 1 Stenosis	21	8	29
Coronary 2 Stenosis	2	4	6
Coronary 3 Stenosis	7	5	12
Coronary 4 Stenosis	8	1	9
Coronary 5 Stenosis	4	3	7
Coronary 6 Stenosis	1	0	1

**Table 3.** Bivariate Analysis Between Independent Variables and Dependent Variables in Post Acute Coronary Syndrome Patients at Hasan Sadikin Central Hospital Bandung in 2019

Variable	Coefficient of Correlation/Approx. Sig.			
	QOL	Emotional	Physical	Social
Level of Severity	*0.033	0.070	*0.008	0.149

\* $p < 0.05$ 

than half of the respondent (58 respondents) after acute coronary syndrome had good quality of life. Conditions with a good result can also be found in each quality of life domain, namely the emotional domain with 64 respondents (64%), the physical domain with 52 respondents (52%), and the social domain with 60 respondents (60%). The table also showed cross tabulation between severity level and the quality of life. The severity level was based on disorders in the heart blood vessels, the most experienced angina pectoris/chest pain with 36 respondents (36%), followed by respondents who experienced blockages in 1 heart blood vessel with 29 respondents (29%).

Based on table 3, there is a significant relation between severity and quality of life of patients after acute coronary syndrome ( $p = 0.033$ ). In addition, there is also a significant relation between severity and physical domain quality of life of patients after acute coronary syndrome ( $p = 0.008$ ).

## Discussion

This research found that more than half of the patients after acute coronary syndrome at Hasan Sadikin Central Hospital Bandung had good quality of life. It is also shown that more than fifty percent of patients had good scores in each domain of quality of life. A systematic review by [Kaambwa et al. \(2020\)](#) found that quality of life of acute coronary syndrome patients increased after receiving treatments therapies, which was in line with this research where the data were collected two weeks after treatment.

The severity level and quality of life of patients after acute coronary syndrome had a significant correlation. This is appropriate with the study by [Moriel, Roscani, Matsubara, Teresa, and Cerqueira \(2010\)](#) which revealed that severity level affects the quality of life of patients after acute coronary syndrome. The severity level had a negative correlation with quality of life, higher severity level

caused lower quality of life. This is in line with Padilla, Martín-Asenjo, and Bueno (2017) who stated that the increase of severity level of acute coronary syndrome increased the risk of disability and lowered the quality of life.

The physical domain was a domain that had correlation with the severity level. It is in line with the research (Zaben & Khalil, 2019) which stated that physical domain is the most affected in post-acute coronary syndrome patients. It can be caused by the physical domain of quality of life score, where there were 48% of respondents who had a poor quality of life and the severity of the disease was closely related to the physical domain of the patient. This finding is in line with a research by Nuraeni et al. (2016), that the focus on improving the quality of life of patients with coronary heart disease is still on the physical aspects. Physical limitations due to coronary heart disease cause a change in one's role (Rosidawati, Ibrahim, & Nuraeni, 2016).

Findings of this study where 43 respondents had comorbidities such as hypertension, diabetes, kidney disease or both could be a possible cause that made more than 30% respondent had poor quality of life. Kim et al. (2013) found at their study that comorbidities such as hypertension and diabetes in patients with unstable angina and older age NSTEMI increase the severity and decrease the quality of life. In line with those findings, Moriel et al. (2010) also said the same thing that patients' quality of life were exacerbated by obesity, comorbidities such as diabetes mellitus and uncontrolled hypertension.

Another study by Kim et al., (2013) stated that the condition of patients with unstable angina and long-term NSTEMI had a worse outcome than STEMI patients. They stated that although PCI was an effective treatment for treating patients with acute myocardial ischemia, it turned out that its benefits for the improvement of general health conditions would not be sufficient, but they need for more specific angina therapy support such as comprehensive supportive care. This is appropriate with this study findings which found that 21% of respondents who experienced angina pectoris had a poor quality of life. This further strengthens that the quality of life of the respondents is 58% in the good category. It may be affected or caused by finding that there were still 21% of respondents who experienced angina pectoris had not received revascularization interventions yet.

## Conclusion

Based on the results of research that has been done, it can be concluded that more than half of patients after acute coronary syndrome in Hasan Sadikin Central Hospital Bandung had good quality of life. Likewise, in each domain of quality of life, such as emotional, physical, and social domains, the quality of life of more than half of the respondents was good.

There was a correlation between severity level

and quality of life of patients post-acute coronary syndrome in Hasan Sadikin Central Hospital Bandung. The severity level had a negative correlation with quality of life, higher severity level caused lower quality of life. Based on the quality of life domain, the severity level was significantly related to the physical-domain. Considering that, regular screening is necessary to improve the quality of life of patients after acute coronary syndrome. Future studies are needed to reveal data related to the length of diagnosis of acute coronary syndrome with quality of life.

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# The Effect of Lateral Position with Head Up 45° on Oxygenation in Pleural Effusion Patients

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## Abstract

**Background:** The accumulation of fluid in the pleural cavity will interfere with the restriction process, namely disruption of lung expansion so that the air entering the lungs is less than normal. One of the effects is shortness of breath and a decrease in oxygen saturation. In this case, nursing actions play an important role in inadequate ventilation, namely positioning. The lateral position is one of the recommended positions for patients with unilateral lung disease, one of which is unilateral pleural effusion. Position selection is very important to facilitate adequate breathing, namely one with a head-up of 45°. According to some literature, the 45° head-up position can reduce consumption and maximize lung expansion which will result in greater ventilation.

**Purpose:** To determine the effect of the lateral position with a head-up 45° on oxygen saturation and respiratory rate in a patient with unilateral pleural effusion at the Dr. H. A. Rotinsulu Lung Hospital Bandung.

**Methods:** The research design was a quasi-experimental design with one group pre and post-test design with a sample of 44 people. The sampling technique used consecutive sampling. The results showed that there were differences in median oxygen saturation and respiratory rate before and after the intervention.

**Results:** The results of a comparative study using the Wilcoxon test obtained a p value of 0.0001 (p value < 0.05). There is an effect of giving a lateral position with a head-up 45° on increasing oxygen saturation and decreasing respiratory rate.

**Conclusion:** Thus, it is expected for the service unit to establish a lateral position in the direction of the effusion with a head-up of 45° as the operational standard for the management of unilateral pleural effusion impaired oxygenation patients.

**Keywords:** gas exchange; lateral positioning; pleural effusion; unilateral lung disease.

## Introduction

Pleural effusion is a condition in which there is an abnormal accumulation of pleural fluid. This is due to the formation of pleural fluid which is faster than the absorption process. The accumulation of fluid in the pleural cavity will cause disturbances in the ventilation process, namely restriction, where there is a disruption in lung development so that the air entering the lungs is less than normal. The impact of this is the presence of shortness of breath, decreased PaO<sub>2</sub>, increased PaCO<sub>2</sub>, and decreased oxygen saturation (Havelock, Teoh, Laws, & Glesson, 2010). Given these conditions, appropriate nursing interventions are needed. There are several nursing actions in overcoming respiratory problems in pleural effusions, namely assessment in the form of monitoring the patient's respiratory status which includes respiratory frequency, auscultation of lung sounds, monitoring of mental status, dyspnea, cyanosis, oxygen saturation, positioning, and collaborative action, namely giving oxygen therapy (Suryantoro, Isworo,

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& Upoyo, 2017). However, positioning is the most appropriate nursing intervention because it can facilitate the problem of oxygenation disorders, that is improving the ventilation process so that it can increase lung expansion to reduce tightness experienced by patients (Dean, 2014).

The position most often used by patients with unilateral pleural effusions is the lateral position directly affected by the effusion. This is evidenced by research conducted by Remolina, Khan, and Edelman (2014) that the partial pressure of O<sub>2</sub> (PaO<sub>2</sub>) and optimal gas exchange occurs when the patient is positioned laterally with the healthy lung at the top. This position will produce maximum gas exchange. The lateral position is one of the positions recommended for patients with unilateral lung disease. One of the lateral positions aims to improve gas exchange in conditions of pulmonary complications. The lateral position is also often used in cases of unilateral lung damage (Bein et al., 2015). This reclining side or lateral position can be used to increase the efficiency of gas exchange, thereby avoiding the use of additional oxygen. According to Kozier, Erb, Berman, and Synder (2011) choosing a position for sufferers with respiratory problems is very important to facilitate adequate breathing, one of which is a head-up 45°. This is evidenced by research conducted by Rustandi, Fatimah, and Mulyati (2014) on the effect of positioning on tidal volume, data were obtained on the position head-up 45° which can increase tidal volume. The increase in tidal volume will cause an increase in oxygenation, where the increase in oxygenation will cause the requirement minute volume for oxygen to be quickly fulfilled so that the respiratory rate tends to decrease (Shah, Desai, & Gohil, 2013).

The head-up 45° uses gravity to help expand the chest and reduce pressure on the abdomen and diaphragm. When gravity occurs, it will pull the diaphragm down, reducing pressure to the diaphragm and relieving chest compressions so that chest expansion and pulmonary ventilation are greater (Kozier, Erb, Berman, & Synder, 2011). This is proven by other studies conducted by Safitri and Andriyani (2014), that the 45° semi-fowler position is effective in reducing shortness of breath in asthma patients. When the lung expansion becomes maximal, it will increase oxygen in the lungs so

that oxygenation disturbances in pleural effusions such as a decrease in PaO<sub>2</sub> which has an impact on decreasing oxygen saturation can improve (increase). When PaO<sub>2</sub> increases, it will increase the affinity of Hb for oxygen and a decrease in the amount of CO<sub>2</sub> will also increase the affinity of Hb for oxygen and vice versa, so that SaO<sub>2</sub> will also increase (Kozier, Erb, Berman, & Synder, 2011).

Monitoring gas exchange can be done in several ways, namely invasive monitoring and non-invasive monitoring. Because monitoring gas exchange can be done non-invasively, in this research, the author will monitor gas exchange in a non-invasive way by using pulse oximetry, considering that pulse oximetry is a tool that has few side effects, does not require calibration, is easy to use, accurate, simple, non-invasive, and inexpensive (Imak & Tinni, 2017). Considering that pleural effusion can increase the volume in the pleural cavity which results in decreased pleural pressure and has an impact on respiratory system disorders, namely impaired lung development, it is necessary to provide the right position to increase lung expansion. According to a literature review, a lateral position with the head-up 45° maximizes the expansion of the lung so it can increase oxygen saturation and respiratory rate.

The purpose of this study was to determine the effect of the lateral position with a head-up 45° on oxygen saturation and respiratory rate in unilateral pleural effusion patients at the Dr. H. A. Rotinsulu Lung Hospital Bandung.

## Methods

The research design was a quasi-experimental design with one group pre and post-test design where the variables to be measured are oxygen saturation and the respiratory rate which are included in the dependent variable. The independent variable in this study is the lateral position with a head-up of 45°. The sampling technique used a consecutive sampling technique with a sample size of 44 respondents. The inclusion criteria in this study were patients with unilateral pleural effusion as evidenced by the results of an X-ray or physical examination by a doctor, the position used was a lateral position with head-up below 45°, nasal cannula oxygen was installed, while the exclusion criteria in this study

**Table 1.** Characteristics of Respondents (n = 44)

Characteristics of Respondents	Result
Location of Pleural Effusion n (%)	
Right pleural effusion	25 (56.8%)
Left pleural effusion	19 (43.2%)
Oxygen saturation before intervention	Median 94.00 (min-max 93–95)
Oxygen saturation after given intervention	Median 96.00 (min-max 94–98)
Respiration rate before intervention	Median 24.00 (min-max 23–24)
Respiration rate after intervention	Median 22.00 (min-max 20–24)

**Table 2.** Frequency Distribution of Cross-Tabulation of Pleural Effusion Locations by Gender

Pleural effusion location	Gender				Total	
	Female		Male		n	%
	n	%	n	%		
Extra pleural effusion	12	27.3	13	29.5	25	56.8
Left pleural effusion	3	6.8	16	36.4	19	43.2
Total	15	34.1	29	65.9	44	100

**Table 3.** The Frequency Distribution of Cross-Tabulation of Pleural Effusion Locations with Age

Location of pleural effusion	Gender				Total	
	<40 years		> 40 years		n	%
	n	%	n	%		
Extra pleural effusion	10	27.7	15	34.1	25	56.8
Left pleural effusion	6	13.6	13	29.5	19	43.2
Total	16	36.4	28	63.6	44	100

**Table 4.** Effect of Giving a Lateral Position with A Head-Up of 45° on Oxygen Saturation and Respiratory Rate

Variable	Mean Rank	Sum of Ranks	Z	P
Oxygen Saturation Before-after the intervention	Negative ranks 0.00	990.00	-	0.0001
	Positive ranks 22.50		5.883	
Breath Frequency Before-after intervention	Negative ranks 21.50	903.00	-	0.0001
	Positive ranks 0.00		5.808	

**Table 5.** Distribution of Increased Oxygen Saturation and Decreased Breath Frequency Before and After Intervention

Variable	Right pleural effusion			Left pleural effusion		
	Before Median Min-max	After Median Min-max	▲ median	Prior Median Min-max	After Median Min-max	▲ median
Oxygen Saturation	94.00 93-95	95.00 94-97	1	94.00 93-95	97.00 94-98	3
Respiratory rate	24.00 23-24	22.00 21-24	-2	24.00 23-24	22.00 20-23	-2

were respiratory rate > 25x/m and the presence of cervical trauma.

This research was conducted at the Dr. H. A. Rotinsulu Lung Hospital Bandung from April 10, 2019 to May 8, 2019. Ethical considerations in the study were the researcher explanation about the objectives, benefits, and research procedures of unilateral pleural effusion patients, and respondents who were willing to become research respondents were asked to fill out an informed consent form. In performing the study, researchers conform and consider the ethical principles of research including respecting the privacy and confidentiality of respondents, providing fair treatment, and taking into account the benefits and losses incurred, paying attention to each respondent. This research was reviewed and approved by the Health Research Ethics Commission, Faculty of Medicine, Universitas Padjadjaran, No: 231/UN6.KEP/EC/2019.

In this study, data collection was adjusted to the

research protocol of giving a lateral position with a head-up of 45°. The head-up 45° is measured using the angle level. Oxygen saturation is measured using pulse oximetry with the brand Choicemmed type Md300c20 and respiratory rate is measured by calculating the frequency of breaths for 1 minute by the first author.

Data analysis used descriptive analysis (frequency, percentage, median, minimum value, and maximum value) and inferential analysis (Wilcoxon test) with a significance <0.05 which was processed using SPSS version 21 software. The Wilcoxon test was used because when the data normality test was carried out, all data were not normally distributed (p value < 0.05).

## Results

Table 1 shows that some of the respondent's pleural effusion locations were left pleural effusions, the

median of oxygen saturation before intervention was 94.00 (min-max 93-95) and the median of oxygen saturation after the intervention was 96.00 (min-max. 94-98). In addition, the median of the respiratory rate before the intervention was 24.00 (min-max 23-24) and the median of the respiratory rate after the intervention was 22.00 (min-max 20-24).

### Cross tabulation of pleural effusion location with gender

Based on [table 2](#), it is shown that 12 (27.3%) were female and 13 (29.5%) were male. In the left pleural effusion, there were 3 women (6.8%) and 16 men (36.4%).

### Cross-tabulation of locations with age-based

From pleural effusion on [table 3](#), 10 people (22.7%) of the left pleural effusions were less than 40 years old and 15 people (34.1%) were over the age of 40 years old. In the left pleural effusion, there were 6 people aged less than 40 years (13.6%) and 13 people aged over 40 years old (29.5%).

## Discussion

Based on the results of the study by [table 1](#), there were respondents who experienced oxygenation disturbances before intervention, namely oxygen saturation below normal values and breathing frequencies above normal values, where the median of oxygen saturation before intervention was 94.00 and the median of the respiratory rate before the intervention was 24.00. This shows that there are respondents who experienced oxygenation disorders, namely oxygen saturation below normal values, where the normal value of oxygen saturation is 95-100% ([Suryantoro, Isworo, & Upoyo, 2017](#)). In addition, another disturbance of oxygenation is an increase in respiratory rate, where the normal value of the respiratory rate is 12-15 x / minute ([Kozier, Erb, Berman, & Synder, 2011](#)). This can occur because pleural effusion patients experience interference with the ventilation process due to a buildup of fluid in the pleural cavity. Ventilation is the process of leaving and entering air into the lungs. The ventilation disturbance that occurs in pleural effusion patients is a restriction, where there is a disruption in lung expansion so that the air entering the lungs is less than normal. As a result, in pleural effusion patients it can be observed that there is an increase in breath effort through an increase in the frequency of breaths as compensation for the body to meet the demand oxygen in the body ([Suryantoro, Isworo, & Upoyo, 2017](#)).

Oxygen is the main body requirement of living things. All cell metabolism in the human body requires oxygen. Disorders of the respiratory system can directly result in reduced oxygen levels in the blood. This state of lack of oxygen in the blood is called hypoxia. Hypoxia can be observed clinically,

one of which is the increase in breath effort, where this condition can be detected by examining oxygen saturation ([Sherwood, 2018](#)). After being given the intervention with a lateral position of a head-up of 45° for 15 minutes, the median value of oxygen saturation has increased and the median value of the respiratory rate has decreased, where after being given the intervention, the median value of oxygen saturation is 96.00 and the median value of the respiratory rate is 22.00. This indicates that there is a change in the median oxygen saturation value and the median respiratory rate before and after the intervention. This can occur because giving a lateral position in the direction of the effusion in the pleural effusion can maximize lung expansion in a healthy lung, resulting in maximum gas exchange.

The research conducted by [Remolina, Khan, and Edelman \(2014\)](#) explains that lying in the direction affected by pleural effusion/lungs which experience pleural effusion is at a lower level when the lateral position results in optimal gas exchange and PaO<sub>2</sub> will be maximum. This is reinforced by research conducted by [Yeaw \(2013\)](#) that patients with unilateral lung damage experience a decrease in the frequency of breaths in the SDL (sick lung down) position or the position of the lungs that are damaged in unilateral lung disease at a lower level compared to the position HDL (health lung down) or a healthy lung position at a lower level. When the SDL (sick lung down) position is given to a patient with unilateral pleural effusion or in other words the healthy lung is above, this position can increase gas exchange in healthy lungs for cases of unilateral pleural effusion. However, when an unhealthy lung (submerged in fluid) depends/is above in a lateral position, it will cause an increase in blood flow to the infected lung area causing a physiological shift (ventilation-perfusion miss-matching) which then causes hypoxemia. This condition will trigger oxygen desaturation (the blood does not get enough oxygen) which will cause an increase in heart work ([Suryantoro, Isworo, & Upoyo, 2017](#)). The right position can also increase the relaxation of additional muscles so that it can reduce breathing effort /dyspnea, reduce oxygen consumption and maximal expansion and increase comfort. As a result, this position is effectively given to patients with shortness of breath ([Kozier, Erb, Berman, & Synder, 2011](#)).

A similar study was conducted by [Fiskasianita \(2014\)](#), comparing the lateral, supine, and fowler positions of the SaO<sub>2</sub> (oxygen saturation) and PaO<sub>2</sub>. The result is that the lateral position with a head-up of 10-15° can increase oxygen saturation in patients with pleural effusions compared to supine and fowler positions which each intervention is carried out for 15 minutes. The results showed that the SaO<sub>2</sub> (oxygen saturation) and PaO<sub>2</sub> values were the highest in the lateral position. In this study, the SaO<sub>2</sub> data were obtained in supine position (94.30%), fowler position (96.40%), and lateral position (96.60%). The PaO<sub>2</sub> value in the

unknown sleeping position was 56.00 mmHg, the fowler position 89.50 mmHg, and the lateral position 90.30 mmHg. Thus, it can be concluded that the lateral position with a head-up 10-15° can increase oxygen saturation and PaO<sub>2</sub> optimally compared to the supine and fowler positions in unilateral pleural effusion patients. [Remolina, Khan, and Edelman \(2014\)](#) in their study stated that the detrimental effect of the lateral position with the diseased side of the lung depends (is on) on unilateral lung damage, which will result in a decrease in PaO<sub>2</sub>. This is evidenced in the results of his research that there is a decrease in PaO<sub>2</sub> by an average of 2.3 mmHg from the lateral position on the healthy side above to the lateral position on the affected side above. The PaO<sub>2</sub> value in the lateral position with the diseased lung which is on higher level is lower than the PaO<sub>2</sub> value in the lateral position with the healthy lung position above in unilateral lung disease. Thus, O<sub>2</sub> partial pressure (PaO<sub>2</sub>) and optimal gas exchange occur when the patient is positioned laterally with the healthy lung on top. Giving a head up of 45° can facilitate adequate breathing.

This is evidenced by research conducted by [Rustandi, Fatimah, and Mulyati \(2014\)](#) on the effect of positioning on tidal volume. Data obtained on the position stated that head-up 45° can increase tidal volume. The increase in tidal volume will cause an increase in oxygenation, where the increase in oxygenation will cause the required minute volume for oxygen to be quickly fulfilled so that the respiratory rate tends to decrease ([Shah, Desai, & Gohil, 2013](#)). Hence, it is hoped that the provision of a lateral position with a head-up of 45° can maximize lung expansion so that the respiratory rate decreases and oxygen saturation increases. Giving a lateral position with a head-up of 45° can also reduce tension in the abdominal muscles by gravitating the contents of the abdomen and the abdominal mass falling, thereby reducing pressure on the diaphragm and relieving chest compressions. At the time of inspiration, the pressure in the lungs is much lower than normal than the atmospheric pressure, which causes more air to be drawn into the lungs ([Jones & Bartlett, 2012](#)). This position will reduce damage to the alveolar membrane due to fluid accumulation in clients with pleural effusions. This is influenced by the force of gravity so that oxygen flow becomes optimal. The higher the position of the head than the pelvis, the greater the force of gravity ([Remolina, Khan, & Edelman, 2014](#)).

### Increased Oxygen Saturation and Decreased Breath Frequency by Location of Pleural Effusion

The results showed that respondents who were diagnosed with left pleural effusions after the intervention experienced a greater increase in oxygen saturation than those with left pleural effusions. Likewise, with the frequency of breaths after the intervention, respondents who were diagnosed with left pleural effusions experienced a

greater decrease in respiratory rate than those with right pleural effusions. It can be seen in table 5 that the median oxygen saturation value after intervention in the right pleural effusion has increased by one and in the left pleural effusion by three. However, the variable frequency of breaths in the right pleural effusion and left pleural effusion has no difference in decreasing breath frequency after the intervention. This is not by the research conducted by [Katz, Nissim, Ariel, Yacov, and Esther-Lee \(2018\)](#) that the oxygen saturation in the left lateral position is lower than that of the right lateral. This occurs because the left lateral position has a less gas exchange effect than the right lateral position. This happens because of the left lung which is smaller than the right lung and the compressive effect of the heart and mediastinum in the left lateral position, thereby reducing the volume of the left lung when given the left lateral position.

When the volume of the left lung is reduced, the ventilation in the left lung is reduced so that the oxygen entering the left lung is less than optimal ([Kozier, Erb, Berman, & Synder, 2011](#)). However, in this study, left lateral pleural effusions given the left lateral position had an increase in oxygen saturation and a greater decrease in respiratory rate compared to right pleural effusions given the right lateral position, which may occur because it is influenced by several factors that can affect lung function lung such as age, gender, height and weight, comorbidities, and pleural fluid volume. Age can affect lung function because when the age is over 40 years, there will be a decrease in the elasticity of the alveoli, bronchial thickening, and a decrease in lung capacity which is affected by aging. This is by table 3, namely the age characteristics of respondents based on the location of pleural effusions in this study. Respondents with extrapleural effusions who are over 40 years old are 15 respondents and those with left pleural effusions who are over 40 years old are 13 people. Thus, the respondent to the right pleural effusion who was over 40 years old was more than the respondents who were diagnosed with left pleural effusion. This causes oxygen saturation and respiratory rate in respondents with left pleural effusions to have a greater increase than respondents with left pleural effusions. Another factor that can influence is gender.

Gender can affect the function of ventilation where the ventilation function of men is 20-25% higher than in women ([Guyton & Hall, 2014](#)). This is related to the anatomical size of the male lung which is greater than that of women. In addition, male activity is higher so that recoil and compliance pulmonary are trained. This is by table 2, namely the characteristics of the sex seen based on the location of the pleural effusion in this study that the respondents with left pleural effusions who were female were 3 respondents and on the left pleural effusions who were male were 16 people. Hence, the male respondents for left pleural effusions were more than the female respondents for left pleural

effusions. This is consistent with the theory that gender affects lung function. Therefore, this causes oxygen saturation and respiratory rate in left pleural effusions to have a greater increase than right pleural effusions.

Another factor is height and weight, as an example someone who has a tall and large body, has a higher pulmonary ventilation function compared to a person who is small and short (Guyton & Hall, 2014). Concomitant diseases can also affect the ventilation process in lateral positioning. This is consistent with the statement of Katz, Nissim, Ariel, Yacov, and Esther-Lee (2018) in their study that comorbidities that are closely related to age, which is related to cardiopulmonary status such as increased body weight and increased heart volume as well as mass can cause changes in ventilation function so that it will have an impact on decreasing oxygen saturation and increased respiratory rate. Unilateral pleural effusion accompanied by infection in the lung parenchyma (airway, alveoli, and blood vessels) can also affect the ventilation process, where when given a lateral position to the affected lung parenchyma will cause a physiological shift (ventilation-perfusion miss-matching) which then causes hypoxemia (Guyton & Hall, 2014). Then, the amount of fluid in the pleural cavity can also affect the ventilation process. This can occur because the amount of fluid in the pleural cavity will affect the volume in the pleural cavity which has an impact on intrapleural pressure, where intrapleural pressure will affect lung development in the process of respiration (Pratomo & Yunus, 2013). However, in this study, body weight, height, comorbidities, and fluid volume in the pleural cavity were not included.

### Effect of Lateral Position with a Head-Up of 45° on Oxygen Saturation and Respiratory Rate

The statistical test results obtained a p value of 0.0001 ( $p \leq 0.05$ ), which means that giving a lateral position to the direction experiencing effusion with a head-up of 45° can increase oxygen saturation and decrease breath rate. Performing routine lateral repositioning is a relatively safe standard practice. However, if the patient's oxygenation drops during the change of position, of course, it becomes dangerous and requires prompt medical attention. During the study, none of the respondents experienced a decrease in oxygenation (increased respiratory rate and decreased oxygen saturation). This is supported by research conducted by Hewitt, Bucknall, and Faraone (2016) which examined the effect of lateral position on arterial oxygen partial pressure (PaO<sub>2</sub>) as a measure of detecting hypoxemia in critical patients with unilateral pulmonary disease. The results of this study showed a difference of 50 mmHg in PaO<sub>2</sub> between the lateral with a bad lung position and those with unilateral lung damage compared to the healthy lung without unilateral damage at the bottom arterial oxygen partial pressure (PaO<sub>2</sub>Lower), that is in a

lateral position with a poor/unilateral lung damaged position at the bottom.

This is due to the gravitational force when given a lateral position. When applied in a lateral position, the force of gravity can increase the intra-pleural pressure at the base of the lungs (the lower lungs). This condition results in more air exchange occurring at the top than at the base of the lungs (the lower lungs). Increasing gravity can increase the amount of effort required for ventilation. Hence, when the patient is positioned laterally in the direction of the effusion, the unilateral pleural effusion will maximize healthy lungs because in this section there is no increase in intra-pleural pressure so that the process of ventilation and lung expansion will be better (Rustandi, Fatimah, & Mulyati, 2014).

However, in this study, there was only a slight difference in oxygen saturation values and respiratory rates before and after the intervention. This can be seen in table 4 where the average oxygen saturation value after being given the intervention increased by 1.73 and the average respiratory rate after being given the intervention decreased by 1.98. This is caused by many affecting factors such as hemoglobin values and comorbidities. However, in this study, hemoglobin values and comorbidities were not included. Hemoglobin value can affect oxygen saturation, where low hemoglobin will result in inadequate oxygen supply so that it will have an impact on low oxygen saturation values (Sherwood, 2018). However, when determining the location of the pleural effusion, all respondents were examined for the conjunctiva, the result is that none of the respondents were anemic. The conjunctiva is the indentation of the eye. In normal condition, the conjunctiva is reddish. However, in certain conditions, namely low hemoglobin, the conjunctiva will be pale, which is called anemic conjunctiva. The presence of low hemoglobin will affect oxygen intake throughout the body, while the conjunctiva is one of the sensitive areas that will appear pale if not flowed with blood. Therefore, the conjunctiva can be used as a predictor of low hemoglobin. This is consistent with research conducted by Qalbi, Razak, and Aminuddin (2014) that there is a significant relationship between conjunctival features and hemoglobin status.

Although there was only slight changes in oxygen saturation value and respiratory rate after the intervention was given, positioning is quite helpful as the first aid in dealing with impaired oxygenation in pleural effusion patients. However, in dealing with impaired oxygenation in pleural effusion patients, it cannot be overcome by positioning alone, which must be assisted with other measures such as oxygen therapy, thoracocentesis, pleurodesis, and chest tube insertion / WSD (Klopp, 2013). Therefore, based on the results of the study, positioning needs to be done by the hospital as the first aid in dealing with oxygenation disorders in pleural effusion patients.

## Conclusion

There is a significant difference in the value of oxygen saturation before and after the intervention, also in the frequency of breaths before and after the intervention is given a lateral position with a head-up of 45° to oxygen saturation and respiratory rate in unilateral pleural effusion patients. Researchers recommend that the service unit establishes a lateral position which is directly affected by the effusion with a head-up of 45° as the operational standard for the management of impaired oxygenation in unilateral pleural effusion patients. The limitations of this study are that it does not control for confounding variables such as hemoglobin value, body weight, height, comorbidities, oxygen flow, and fluid volume in the pleural cavity. Hence, further research can be done by paying attention to confounding variables.

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# Awareness of the Food-Based Diet Guidelines, Eating Practices, and Preferred Sources of Nutrition Information of Employees in an Open University in the Philippines

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## Abstract

**Background:** Physical inactivity and unhealthy diet are considered as major risk factors in the development of the “fatal four” Non-communicable Diseases (NCDs) (WHO, 2018). As the University of the Philippines Open University (UPOU) adopts a sedentary work lifestyle with most of the employees spending long hours at the office sitting in front of a computer screen, the university must be able to promote health and wellness in the workplace, particularly healthy eating.

**Purpose:** Thus, the study aimed to determine UPOU employees’ awareness of the Food-based Dietary Guidelines (FBDGs), adherence to the 2012 Nutritional Guidelines for Filipinos (NGF), and preferred sources of information on healthy eating to provide insights for the development of nutrition interventions in the university.

**Methods:** A total of 85 healthy employees aged 19-59 years old accomplished an online adapted survey from February to April 2019 which included questions on awareness of the four FBDGs--2012 NGF; Kumainments (simplified version of NGF); Daily Nutritional Guide Pyramid (DNGP); and Pinggang Pinoy (a plate-like pictorial model), eating practices relative to the 2012 NGF, and preferred sources of information on the FBDGs. Data were analyzed using descriptive statistics.

**Results:** Results of the study showed that most of the respondents were not aware of the FBDGs. Among those who were aware, only a few have read the FBDGs. Adherence to the guidelines was also low as reflected by a very low percentage of respondents practicing the messages on the recommended frequency of intake of food groups.

**Conclusion:** Results suggest conducting lectures or seminars and producing video materials about nutrition which can be uploaded in UPOU’s online repository of multimedia resources and social media sites to promote healthy eating practices among UPOU employees and ensure a healthy and sustainable workforce.

**Keywords:** eating practices; FBDGs awareness; Open University Philippines; preferred information sources.

## Introduction

Non-communicable diseases (NCDs), also known as chronic diseases, are non-infectious medical conditions which last for a long period of time and generally progress in a slow manner. These diseases can develop as a result of the confluence of genetic, physiological, environmental, and behavioural factors. Cardiovascular diseases such as heart attacks and stroke; cancers; chronic respiratory diseases like chronic obstructive pulmonary disease and asthma; and diabetes; are the four main types of NCDs (WHO, 2018; WHO, 2013; Nordqvist, 2011; CDC, n.a., 2013; Cirino, 2011).

NCDs remain the leading causes of mortality worldwide, killing 41 million people each year which is equivalent to 71% of all deaths globally. WHO

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reported that every year, 15 million people between the ages of 30 and 69 years die from NCD and over 85% of these “premature” deaths occur in low- and middle- income countries. Cardiovascular diseases account for most NCD deaths, or 17.9 million people annually, followed by cancers (9.0 million), respiratory diseases (3.9million), and diabetes (1.6 million). With this current trend, progress towards the 2030 Agenda for Sustainable Development is threatened, specifically the target of reducing premature deaths from NCDs by 25% in 2025 and one-third by 2030 (WHO, 2018).

Moreover, NCDs also account for more than half of the global burden of disease preventing people from living a long life in full health. The total burden of disease is measured both from years of life lost and years lived with disability (KFF, 2019; Roser, M. & Ritchie, H., 2018; IHME, 2018). Poverty is also closely linked with NCDs. The rapid rise in NCDs is predicted to impede poverty reduction initiatives in low-income countries, particularly by increasing household costs associated with health care. In low-resource settings, health-care costs for NCDs quickly drain household resources. The exorbitant costs of NCDs, including often lengthy and expensive treatment and loss of breadwinners, force millions of people into poverty annually and stifle development (WHO, 2018).

As stated by the UN Philippines Resident Coordinator, Ola Almgren, NCDs have great social and economic impact on individuals and countries and are now considered as a major challenge for sustainable development (Lalu, 2018; WHO, 2018). There is a need to prevent and treat NCDs to achieve quality of life and long term survival and according to WHO (2018), an important way to combat NCDs is to focus on the risk factors associated with these diseases.

Unhealthy eating is one of the major risk factors for NCDs, thus promoting healthy dietary practices would aid in controlling NCDs (WHO, 2018; WHO, 2013; Nordqvist, 2011; CDC, n.a., 2013; Cirino, 2011). Several Food-based Dietary Guidelines (FBDGs) have been established in the Philippines for health promotion and disease control and prevention. These science-based policy guidelines or recommendations provide clear dietary advice on food rather than nutrition as well as easy-to-understand technical nutrition information to educate individual consumers (EFSA, 2010; Kuizon, et al., 1990; Tanchoco, 2011; Tee, et al., 2016). FBDGs in the Philippines include the Nutritional Guidelines for Filipinos (NGF), Daily Nutritional Guide Pyramid (DNGP), Kumainments, and Pinggang Pinoy.

NGF is a set of dietary guidelines based on Filipinos’ eating pattern, lifestyle, and health status. The first nutritional guidelines created in 1990 consisted of five messages only. In 2000, a revised NGF composed of 10 messages was released. Years after, the 2000 version was again revised by the technical working group led by the Food and Nutrition Research Institute of the Department

of Science and Technology (FNRI-DOST) which resulted to the 2012 NGF that now includes the basis and justification for each of the 10 key messages (FNRI-DOST, n.d., 2015).

On the other hand, DNGP is a visual translation of the NGF presenting levels of recommended daily consumption of different food groups. Those at the bottom of the pyramid like whole grains and vegetables should be eaten more, while those at the topmost such as fats, and oils, sugar, and red meat should be eaten the least. Messages about exercise and personal and environmental hygiene practices that are slightly separated at the bottom of the pyramid serve as support messages (FAO, n.d., 2014; DOH, n.d., 2020).

The FBDGs in the country also include Pinggang Pinoy which uses a familiar plate model to show the relative proportion of major food groups (rice and alternatives, fish and alternatives, and vegetables and fruits) – in a plate on a per-meal basis. It was developed as a complement to the DNGP (DOH, n.d., 2020).

Lastly, the Kumainments is the popularized version of the revised NGF. It consists of 10 shortened and simplified messages of the NGF for better recall and understanding at the barangay and household levels (NNC, 2015).

Another major risk factor in the development of NCDs is physical inactivity (WHO, 2018). Regular physical activity is a well-established protective factor for the prevention and treatment of the leading NCDs and it also improves mental health, delays the onset of dementia and improves quality of life and well-being. However, in the University of the Philippines Open University (UPOU), a sedentary work lifestyle can be observed. As all courses offered in the university are delivered online, most of the employees spend long hours (at least eight hours) at the office sitting in front of a computer screen and not engaging in any physical activity. An infographic from Online University has also presented that a sedentary job “kills” employees as it slows their metabolism, promotes obesity and increases rates of death from heart disease (Online University, 2012). A study by Kurniawan et al. (2018) also revealed that university staffs have a greater risk of developing NCDs such as cardiovascular diseases and diabetes and have a more unsatisfactory work quality. In order to address this health concern, the UPOU Health and Wellness Committee conducts various physical activities for its employees before and after work hours. They do volleyball, basketball and dancercise sessions twice a week and short warm-up exercises during flag ceremony at the start of every week.

Although workplace physical activity programs are increasingly proposed or being conducted to increase physical activity levels of employees in UPOU, sitting and screen time remain extremely high. The most realistic and effective things sedentary workers can do to avoid the consequences of not engaging in any, or very little, physical activity

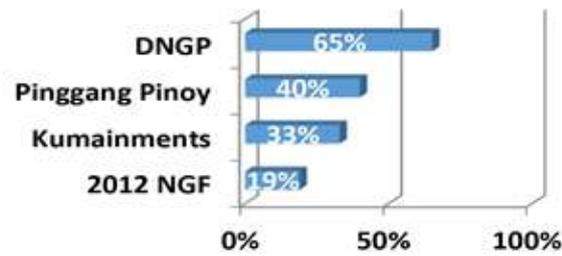


Figure 1. Distribution of respondents by awareness of FBDGs

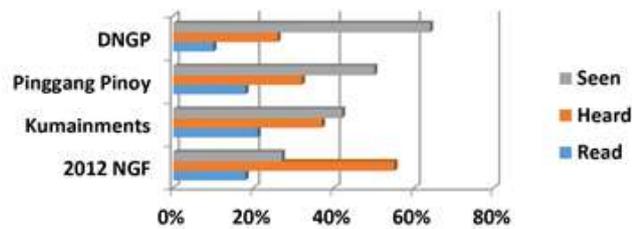


Figure 2. Distribution of respondents by level of awareness of FBDGs

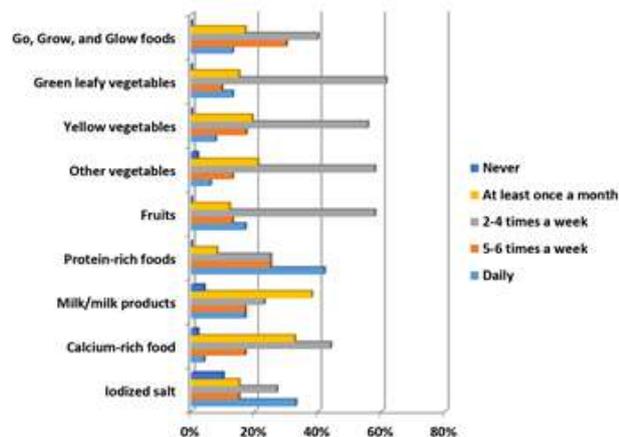


Figure 3. Distribution of reactions to the positive practice statements

for eight or more hours a day is to practice healthy eating habits (Williams, 2018; Gulbin, n.d., 2011). Even if they do not have a lot of flexibility in terms of being active on the job, they do have control over the food and drinks they are consuming throughout their day. Even in meetings/activities inside or outside the university, food served are decided by employees themselves, mostly the administrative staff. Thus, it is really important for UPOU employees to be aware of and to practice healthy eating behaviors. This study determined their awareness of FBDGs, eating practices relative to the nutritional guidelines, and preferred sources of information about healthy eating.

As most of the health programs or activities being implemented in UPOU under its Team Approach and Youthful Outlook (TAYO) flagship program do not focus on food and nutrition, this research study would very much benefit the university. The

study's results and recommendations would guide the UPOU Health and Wellness Committee in developing nutrition-related programs/activities aimed at promoting healthy eating practices among UPOU employees.

## Methods

The study used the survey research design to gather data from the respondents. All 150 employees were asked to participate in the study excluding those with specific health conditions like hypertension and diabetes. A total of 85 healthy employees aged 19-59 years old were able to complete the online adapted survey which includes questions on awareness of the four FBDGs—2012 NGF; Kumainments (simplified version of NGF); Daily Nutritional Guide Pyramid (DNGP); and Pinggang Pinoy (a plate-like pictorial model), eating practices

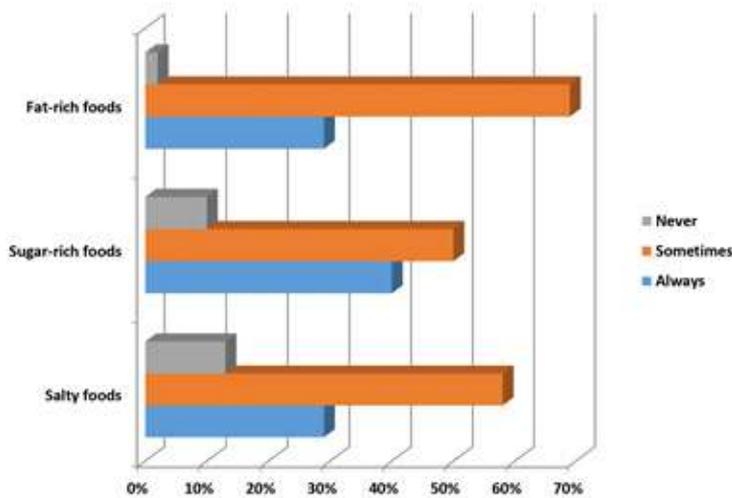


Figure 4. Distribution of reactions to the positive practice statements

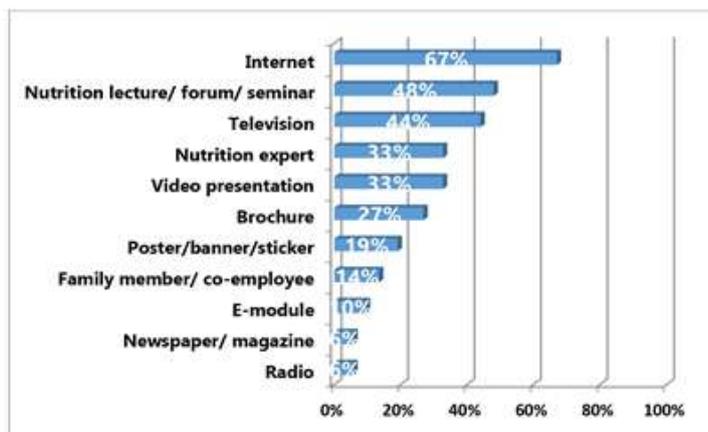


Figure 5. Distribution of respondents by preferred sources of information

relative to the 2012 NGF, and preferred sources of information on the FBDGs (Lopez-Madrid, et al., 2018). Pretesting was done prior to the use of the tool in the study. To eliminate response bias, the study ensured anonymity and confidentiality of the responses. Other ethical issues such as informed consent, beneficence, and non-maleficence were also taken into consideration. Clearance from the ethical review board of FMDS was sought prior to the implementation of the research. Data were analyzed using descriptive statistics such as frequency counts and percentages and measures of central tendency (median, mode).

## Results

### Awareness of the FBDGs

As can be seen in Figure 1, majority (65%) of the respondents have seen, heard, or read the Daily Nutritional Guide Pyramid (DNGP). However, only a minority were aware of the Pinggang Pinoy

(40%), Kumainments (33%), and 2012 Nutritional Guidelines for Filipinos (NGF) (19%).

Among those who were aware, only a few have read the FBDGs. Figure 2 shows that most of the respondents have only seen or heard about the DNGP (90%), Pinggang Pinoy (82%), Kumainments (79%), and 2012 NGF (82%).

### Eating Practices

As shown in Figure 3, most (87%) of the respondents do not eat a variety of food (Go, Grow, Glow) daily. Moreover, most of the respondents consume green leafy vegetables (77%), yellow vegetables (75%), other vegetables (79%), fruits (70%), milk or milk products (61%), and other calcium-rich foods (77%) only 2-4 times a week or at least once a month. Majority of the respondents also only sometimes limit their consumption of fat-rich and high in cholesterol foods (69%), sugar-rich foods (50%), and salty foods (58%).

### Preferred Sources of Information

Figure 4 presents the distribution of respondents by their preferred sources of information on healthy eating or FBDGs. Their top two most preferred sources of information were the internet (67%) and nutrition lecture/forum/seminar (48%), followed by television (44%), nutrition expert (33%), and video presentation (33%).

### Discussion

Only a minority of the respondents were aware of the *Pinggang Pinoy* (40%), *Kumainments* (33%), and 2012 Nutritional Guidelines for Filipinos (NGF) (19%). Among those who were aware, only a few have read the FBDGs. These findings suggest increasing UPOU employees' level of awareness of the FBDGs to be able to adhere to the guidelines and practice healthy eating behaviors. According to a study by [Bechthold et al. \(2017\)](#), awareness of the FBDGs is indispensable to encourage people's performance of desired behaviors.

The respondents also generally reported unfavourable eating practices with almost all of the statements being practiced infrequently. Most (87%) of the respondents do not eat a variety of food (Go, Grow, Glow) daily. This is consistent with the 2013 National Nutrition Survey (NNS) where it was found that Filipino's meal pattern only consisted of rice and fish or rice and vegetables ([FNRI-DOST 2015](#)). Similar also to the results of the 2013 NNS, most of the respondents consume green leafy vegetables (77%), yellow vegetables (75%), other vegetables (79%), fruits (70%), milk or milk products (61%), and other calcium-rich foods (77%) only 2-4 times a week or at least once a month. Factors such as high cost of nutritious foods like vegetables and fruits, limited access to fresh foods, and lack of awareness or knowledge about nutrition may have contributed to their low frequency of consumption of these food items ([Ball et al., 2003](#); [De Abreu et al., 2014](#); [Fukuta et al., 2008](#); [George et al., 2005](#)). Majority of the respondents also only sometimes limit their consumption of fat-rich and high in cholesterol foods (69%), sugar-rich foods (50%), and salty foods (58%). Such findings indicate that the respondents must be persuaded to limit their intake of these kinds of food every day to prevent cardiovascular diseases.

The results previously discussed suggest communication gaps or entry points: UPOU employees must be informed about the FBDGs and must be persuaded to adhere to these dietary guidelines. To help address these issues or bridge the gaps, communication interventions can be conducted ([FAO, 2014](#)). Results of this study showed that the respondents' top two most preferred sources of information were the internet (67%) and nutrition lecture/forum/seminar (48%), followed by television (44%), nutrition expert (33%), and video presentation (33%). These sources of information can be used in future health communication

interventions that will be conducted in the university to promote healthy eating behaviors among UPOU employees.

### Conclusion

Results of the study showed that most of the respondents were not aware of the FBDGs. Among those who were aware, only a few have read the FBDGs. Adherence to the guidelines was also low as reflected by a very low percentage of respondents practicing the messages on the recommended frequency of intake of food groups. Programs that would increase UPOU employees' awareness of FBDGs and healthy eating practices could be implemented. Based on the results, the UPOU Health and Wellness Committee could conduct nutrition lectures or seminars and invite an expert to serve as resource person. Video presentations could serve as supporting materials in the lecture. As the respondents mostly prefer to get nutrition information on the internet, the lecture/s could also be uploaded in UPOU's online repository of multimedia resources—the UPOU Networks. The university could also produce more video materials about food and nutrition and upload them at the UPOU Networks site as well as in their social media sites to promote healthy eating practices among UPOU employees and ensure a healthy and sustainable workforce. This study may also be conducted in similar institutions where there are no existing communication programs for employees focusing on food and nutrition.

As for the limitations of the study, the very nature of the survey research design means relying on the honesty of the respondents. According to [Mauldin \(1965\)](#), verbal and non-verbal behavior do not go hand in hand. That means that the statement of a person does not necessarily reflect his or her actions ([Hauser, 1967](#)). To counter this reliability issue, the researcher did a review of employees' health records at work. The records would reveal the health condition of employees which reflects their actual eating practices.

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# The Effect of Patient Acuity Tool on Patient Clinical Practicum Assignments on Nursing Student Satisfaction Levels: A Quasi-Experimental Study

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## Abstract

**Background:** Unequal patient assignment is a problem of nursing students during clinical practicum. Registered nurses use patient acuity to ensure balanced work distribution, but its benefits has not been assessed on student nurses to date.

**Purpose:** The study's objective is to determine the effect of patient acuity tool on student nurses' satisfaction level during practicum.

**Methodss:** The study utilized quasi-experimental design to level II and III nursing students at a University in Quezon City, Philippines. 6-Module Online course including videos, notes, and quiz using Google Classroom was used; orientation and simulation were conducted through Zoom and Facebook Messenger. The participants were tasked randomly to use Patient Acuity Tool or conventional method during patient distribution. A modified Kuopio University Hospital Job Satisfaction Scale was used to identify and compare satisfaction levels of the two groups. Descriptive and Independent Samples T-test using Statistical Package for the Social Sciences version 26 were used to analyze data.

**Results:** Requiring factors, motivating factors, and working welfare of students utilizing Patient Acuity Tool are higher in overall mean satisfaction rate (3.36, 3.71, 3.89 vs 3.57, 3.81, 3.91); however, mean satisfaction showed no significant difference based on indicators (p-value 0.372, 0.694, 0.052, 0.921, and 0.469) and overall satisfaction (p-value 0.947). The requiring factors of work reflects the lowest mean scores given by those who have used the Conventional Method focusing on number of staff (2.97) and even workload distribution (2.14).

**Conclusion:** Contrary to the last result, those who have distributed patients using the Patient Acuity Tools gave a mean score of 3.55.

**Keywords:** clinical competency; clinical practicum; nursing students; patient acuity; satisfaction.

## Introduction

Nursing students' clinical experience is considered an essential aspect of nursing education since it molds and prepares their competency in caring for patients (Sharif & Masoumi, 2005). Although an internship is the best way to learn, some students did not improve their skills despite being in the clinical area (Candelasa, 2016). In upgrading the learning quality, barriers associated with student nurses' knowledge and skillful growth should be assessed; and the quality of care rendered and nurses' productivity are dependent on their job satisfaction (Kousar et al., 2018). A Level II or III student nurse in the Philippines should handle three patients (CHED, 2017). However, some students report lack of direct experience, less opportunity

to perform practical techniques, not handling complex cases, and the competitive atmosphere and demanding academic requirements make them more unsatisfied (Memarian et al., 2015). Clinical duties are well-rounded as nursing students also spend countless hours studying pathogenesis of a patient's condition, medications, and patient procedures to develop a concrete and holistic care plan (Nurse Journal, 2021).

Student nurses' clinical exposure is significant in enhancing competency. Interweaving theoretical knowledge to these practical settings is one of the challenges during internship. Student nurses need to enhance their reasoning skills as these are salient in the clinical judgment processes (Yauri et al., 2019). According to theory, the combination of practice, good clinical supervision, and equity in workload could enable student nurses to feel competent, useful, and satisfied with their abilities and experiences to take care of the patients (Tiwaken, S., Caranto, L., & David, 2015). The study was primarily grounded in the Advanced Nurse Practitioner's ComPOSURE Behavior and Patient's Wellness Outcome. The definition of Competence based on the ComPOSURE behavior by (Divinagracia, 2001) can also be applied to nursing students as they are able to gain knowledge and clinical experience followed by expertise in patient care which leads to their satisfaction. In order for an individual to be competent, they must be satisfied with their job. It has been said that job satisfaction affects a person's competency.

Instructors are also key players in maintaining students' satisfaction levels. Since they are at the forefront of clinical training, instructors should guide and actualize students employing both theory and practice through mentoring. Teachers must consider every students' differences – it is not rational to assume that student nurses have similar acquired knowledge and skills because learners have various needs on a given day. A university in Benguet, Philippines, mentioned the importance of re-evaluating clinical skills training in the nursing field. Their participants stated some anxiety-provoking problems encountered during practicum, like being handled by a preceptor they are not on good terms with and completing a huge amount of workload in the ward. Each patient's unique requirements either promote or stagnate students' knowledge and skills. Students with fully-loaded procedures can eventually sacrifice theoretical expertise and quality of care. These conditions affect student's satisfaction consequently (Atakro et al., 2019; MacPhee et al., 2017; Tiwaken, S., Caranto, L., & David, 2015)

Nursing students could distrust their clinical competence due to lack of experience (Hashemiparast et al., 2019). Considering these, it could decrease student nurses' level of satisfaction in the clinical ward and affect their overall performance (Bazrafkan & Kalyani, 2018; Nurumal, M. S., Diyono, N., & Che Hasan, 2020). There is a strong

correlation between nursing students' satisfaction with their heightened competency (Papastavrou et al., 2016). Results garnered and assessed through the Clinical Learning Environment Supervision and Nurse Teacher (CLES + T) show that if students are highly satisfied with the learning environment, most especially its pedagogical facet, burgeoning competencies are established.

The nurses' role is not just limited to providing care in the ward; there are also circumstances when nurses need to transfer patients to different hospital departments which is time-consuming apart from their heavy workload (The Top 3 Benefits of Acuity-Based Staffing for Your Organization, n.d., 2014). Deprivation from concentration, an element crucial for a nurse's performance, can happen because of overstretching workload (Safdar et al., 2019). An acuity-based staffing system manages without considering the number of patients. Instead, the system focuses on patient needs. Nurse-patient assignment (allocation of patient care to nurses for a specific shift) is done by charge nurses (Allen, 2015) and faculty members or group leaders on students during clinical learning hours.

By definition, patient acuity is categorizing patients based on the nursing care they require. The Patient Acuity Tool improved nurse's reports on receiving equal assignments with 7% and 55% satisfaction before and after patient distribution (Acar & Butt, 2016). A study of one healthcare corporation claims acuity-based staffing as beneficial in giving fair assignments, matching patient needs and nurses' competence, and increasing nurses' satisfaction and productivity (The Top 3 Benefits of Acuity-Based Staffing for Your Organization, n.d., 2014). However, literature about effectiveness of the Patient Acuity Tool is mostly based on western viewpoint, and its effectiveness to measure level of satisfaction of student nurses concerning patient assignment has not been evaluated to date.

In addition, using the Patient Acuity Tool is linked to increasing nurses' satisfaction (Brennan et al., 2019), better patient outcomes (Nurse Journal, 2021), reduction of stress, decreasing nurse turnover, and highlighting the nurses' exceptional care. The Patient Acuity Tool also benefits the entire healthcare team and the institution (O'Keeffe, 2016).

## Methods

A quasi-experimental design was utilized to determine the effect of using Patient Acuity Tool in clinical practicum patient assignment on the satisfaction level of student nurses. The study was conducted at a University in Quezon City, Philippines. The study aimed to identify and compare the satisfaction levels of nursing students before and after using Patient Acuity Tool and Conventional Methods in assigning patients during clinical practicum. It was hypothesized that the satisfaction levels of those who used the Patient Acuity Tool is significantly higher than those who

used the Conventional Method.

A modified questionnaire was evaluated by faculty members to assess the appropriateness of the tool. Pilot study was done to regulate the flow of research protocol. The investigators utilized purposive sampling and recruited 60 nursing students from Level II and III using sample size estimation with two means (Sullivan, n.d.). Recruitment was done by posting invitations online and sending invitations through Year Level Group Chats and emails with Class Adviser's approval. Participants were at least 18 years, enrolled in AY 2019-2020, previously assigned in OB-Gyne and Pediatric Ward, and with stable internet connection.

The OB-Gyne ward is a mother baby-friendly area with two divisions - the rooming-in unit, which caters to postpartum well mothers and the GYNE for high risk and alterations of the reproductive system. The Pediatric ward consists of a clean isolation room, which caters to cancer patients undergoing chemotherapy; a dirty isolation room where patients with communicable diseases are being accommodated; and the general ward for other pediatric cases. The OB-gyne Ward and Pediatrics Ward cater to 20 and 18 patients, respectively. During the clinical practicum, 10-12 students are assigned in these wards, handling 1-2 patients on an 8-hour shift. In addition, Department rotation happens every two weeks for students taking Care of Mother, Child and Family (Well-clinic) and every four weeks for students taking Care of Mother and Child at Risk or with acute and chronic problems.

Participants were excluded if they could not attend the orientation and were absent for more than two days during clinical practicum, either excused or not. The recruitment happened for a week. An orientation was given to the participants and they were asked to sign an informed consent and upload them to the Google Classroom before the online course was conducted.

In line with the recent announcement of extended Enhanced Community Quarantine in Luzon (Memorandum from the Executive Secretary On Community Quarantine Over the Entire Luzon and Further Guidelines for the Management of the Coronavirus Disease 2019 (COVID-19) Situation, 2020), the investigators conducted all data collection process online.

### Intervention protocol

The investigators developed a 6-Module Online Series about Patient Acuity Tool orientation. Each module includes video, lecture note, and quiz. Participants can only proceed to the next module if they attained a passing score of 70% in modular quizzes. Google Classroom, Office 365, and official university email accounts were utilized to recruit, communicate with the participants, provide lecture series, collect answered research instruments, and disseminate results. The investigators facilitated all data collection procedures as supervised by Faculty members.

The entire learnings of the student nurses can be applied in simulated online clinical practice scenarios to enhance their self-confidence and clinical judgment skills because they can do procedures repetitively, which allows thorough practice that provides no risk to patients since training is web-based simulated (Hustad et al., 2019).

The participants were divided into control and experimental groups using SPSS randomizer, the investigators who conducted the simulation were also randomized. Furthermore, the two groups were divided into A and B for OB-Gyne and Pediatric wards. The intervention consisted of utilizing the Patient Acuity Tool on patient assignment on their simulated OB-Gyne and Pediatrics ward rotation. The experimental group received the Patient Acuity Tool intervention, and the control group used a conventional method (randomized) of patient assignment. A student leader was randomly appointed per group and was tasked to assign patients to the members. After receiving their patient assignments, the group members individually computed patient acuity scores of the given case scenarios to evaluate if there was a fair distribution of patients and tasks to everyone. The online simulation was done through Zoom Conference and Facebook Messenger Chat. The lecture part can be accomplished for 4-6 hours, quizzes for 1-3 hours. This was done during the first day. The simulation and post-test using the Kuopio University Hospital Job Satisfaction Scale (KUHJSS) took 3 hours, conducted the following day. Google Forms were utilized and names were not required in filling up the questionnaire. Collection of data was automatically done thru Excel as a feature of Google Forms. Students who completed the study received a certificate of participation.

Figure 1 shows that a total of 63 participants enrolled in the Google Classroom. However, there were two participants who did not finish the simulation and submit the post-test questionnaire (due to unexpected internet connectivity problem).

### Research Tools

There are five Patient Acuity Tool acuity categories namely procedures that are complicated, education, interventions given (psychosocial or therapeutic), drugs administered, and complex IV drugs and measurements. Rating options ranged from 1 (lowest) to 4 (highest). These ratings are then added to get the sum of the acuity score of an individual patient. Total score ranges from one (1) to sixty (60). Grouping of patients follows as all acuity scores are categorized from 1 to 4 (The Top 3 Benefits of Acuity-Based Staffing for Your Organization, n.d.). Patients tagged within categories are carefully assigned to students to distribute the workload equally (e.g., a student will handle 2 patients under category 1 and 3, 2 patients under category 2, or just 1 category 4 patient). With Cronbach's alpha coefficient of 0.87, Patient Acuity Tool has been identified to be reliable and valid over the years (Perroca, 2011). Validity of

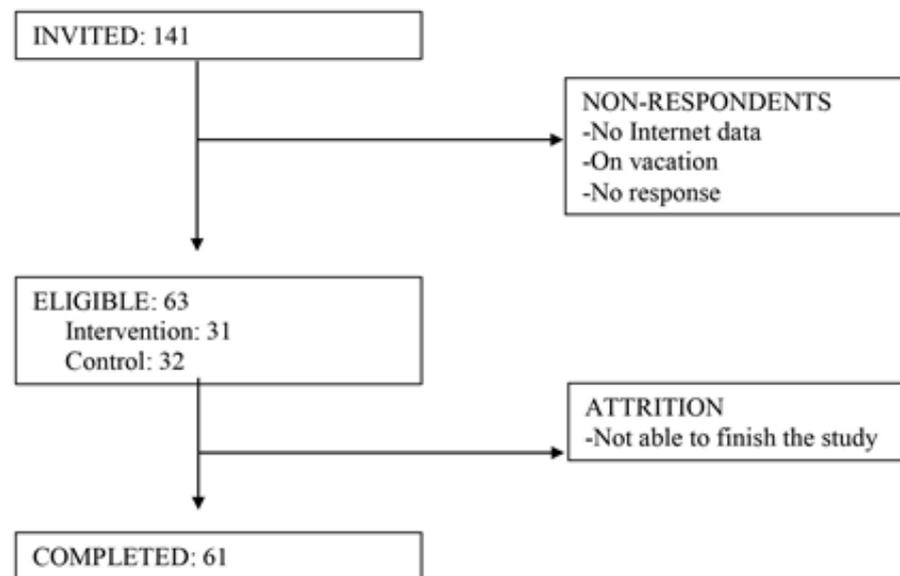


Figure 1. Participant Flow

the constructs was also examined. The variables used to formulate the instrument were essential and included on actual discrimination of patients' care needs and categories. The KUHJSS assessment was invented at the Department of Nursing Science of the University of Eastern Finland (Kvist et al., 2012). Ten items identify the demographic profile and professional traits; and thirty-seven (37) 5-point Likert scale to determine job satisfaction levels.

The data analysis used Statistical Package for the Social Sciences (SPSS) version 26. It used descriptive statistics (percentage distribution and frequency of demographic profile and inferential statistics) and Independent Samples T-test to identify mean differences between groups.

The study received approval from the Institutional Ethics Review Committee. Strict compliance with ethical protocols was done. Informed consents were explained, signed, and submitted through Google Classroom. Three Faculty members supervised the entire process. Authorization to use the tools in this study was granted by the authors.

UERMMMCI Ethics Review Committee has approved this study (0781/C/2020/009). Informed consents were signed and submitted to investigators upon enrolling in the Google Classroom.

## Results

Table 1 shows a total of 61 students participated in this study; 31 participants were assigned to use the Patient Acuity Tool while 30 were assigned to use the conventional method. Participants are mostly females (93% and 80.64%) and there were more Level II students in both groups (83.30% and 67.74% respectively).

All the answers of the participants who have utilized the Patient Acuity Tool, on the other hand, are

all under 'partly agree'. This is similar to the answer of those who used the Conventional Method except for Requiring Factors of Work which is interpreted as 'neither agree nor disagree' as seen in Table 2. Requiring factors of work, motivating factors of work, and working welfare of those who used the Patient Acuity Tool are higher in overall mean satisfaction rate in terms of individual indicators.

Independent samples t-test was calculated to compare these five indicators between control and experimental groups. The mean of the first, second, and fourth indicators (Requiring Factors of work, motivating factors of work, and working welfare) is higher on the experimental group than the control group with absolute values of t-scores reveal that t-obs (-0.899, -0.276, and -0.100) which leads to failure of rejecting null. Although there was an increase in the level of satisfaction of these three factors, no significant differences were noted on all indicators.

Table 4 shows t observed of 0.067. With a degree of freedom of 46 and a level of significance of 0.05 on a two-tailed test, it shows that our critical T value is [1.671]. T observed is less than t critical; no significant difference between participants' satisfaction level using Conventional Method and Patient Acuity Tool was noted.

## Discussion

This study noted that there is no significant difference between overall satisfaction levels of students who used the Patient Acuity Tool and Conventional Method (p-value 0.947). Three indicators, namely requiring factors of work; motivating factors of work; and working welfare; showed an increase in the mean satisfaction level. However, p-values show that there are no significant value between the

**Table 1.** Summary of Demographic Profile of Respondents

Variable	Conventional		PAT	
	n	%	n	%
Gender				
Male	2	6.66	6	19.35
Female	28	93	25	80.64
Year Level				
2	25	83.3	21	67.74
3	5	16.66	10	32.25
Ward				
OB-Gyne	15	50	15	48.38
Pedia	15	50	16	51.61

*Patient Acuity Tool (PAT); Obstetrics-Gynecology (OB-Gyne)*

different indicators of student satisfaction (0.372, 0.694, 0.052, 0.921, and 0.469). The analysis of these findings are highlighted in the succeeding individual discussions of the different indicators.

Satisfaction of students in terms of Requiring Factors of Work using Conventional Method has an overall weighted mean of 3.36, interpreted as “Neither agree nor disagree.” Student nurses’ satisfaction in requiring factors of work which received patients using Patient Acuity Tool has an overall weighted mean of 3.57 translated to “Partly agree” on this certain domain. Nurses evaluated the practice environment to determine positive and stimulating aspects of their day-to-day practice; this can vary depending on the nurse’s country (Kvist et al., 2012). The challenges that nurses’ face every day can be overcome by appropriateness of resources for nurses.

The importance of measuring appropriateness of workload of nurses is not only exclusive in the Philippines. The differences based on culture, workforce, and resources available in the work environment should be considered. Since student nurses are not yet receiving salaries or benefits, national policies on nurses do not influence the answers yet. Level II and III students are still very excited to experience their clinical exposure, which is a new experience for them. The orientation and basic tasks that they need to accomplish are not too stressful for them as the excitement and eagerness to learn overpower the demands of their tasks. This has also been balanced because compared to Level III students, the Level II students do not have too much paperwork to accomplish, and their subjects are considered lighter. Hence, there is still a good balance between work and personal life for the younger participants. Another balancing factor is that Level II students are also allowed to work in teams and pairs, giving them higher sense of satisfaction during clinical duty even if they have more patients than the others; this is in comparison to Level III students who are transitioning towards concepts needing higher skills as well as leadership and management.

Factors associated with work satisfaction for

registered nurses. Nurses’ quantitative workload was not related to job satisfaction. Nurses who think they have a high or low workload have no difference in level of satisfaction because of perceived fairness or “distributive justice” of workload (Ruggiero, 2005). Furthermore, satisfaction is found not to be affected if everyone is working hard. This is what Patient Acuity Tool tries to address, distributing patients based on tasks and not quantity.

Decreased concentration due to overloading of work creates dissatisfaction (Safdar et al., 2019). Dissatisfaction comes from lack of justice in terms of workloads, few days off, and influences on recruitment and retention of nurses in ward; meanwhile, newly graduates get dissatisfied with the salary (Cowin, 2002). Other factors that influence the satisfaction of newly grads include professional status and autonomy. Considering that most of the nurses in hospital nowadays are new graduates, and the study participants are incoming level III and graduating students; understanding these factors can help educators identify issues regarding their workplace satisfaction in the future. These identified concerns can be used to orient students and help them identify solutions in advance.

Satisfaction of students who used the Conventional Method of patient assignment in terms of Motivating Factors of Work has an overall weighted mean of 3.71, interpreted as a “Partly agree” statement. Students who used the Patient Acuity Tool on patient assignment had a partial difference in overall mean scores with 3.81. Students could appreciate their tasks because of the fulfilling nursing profession has to offer in their job experience (Obrist, R., Berger, D. P., & Obrecht, 1990). Nurses working in a hospital for longer than ten years appreciate their work more than new graduates (Cowin, 2002; Rambur et al., 2005). Nurses who can apply their skills and expertise are more satisfied. The student nurses only have 3 years of clinical experience, half of which is intensive practice; this is not enough to fully recognize their tasks yet as established in the previous study. They still see their assignments and clinical duties as interesting and suitably challenging. Fresh graduates have a very

**Table 2.** Mean Scores per Survey Question from the Modified KUHJSS of students using Conventional Method and PAT

	CONVENTIONAL Weighted Mean	PAT Weighted Mean
<b>Requiring Factors of Work</b>		
My workload is appropriate	3.87	3.97
There are usually enough staff in my unit	2.97	3.29
I do not find my work too stressful	3.74	3.42
I am satisfied with my working hours	3.84	3.68
Combining work and personal life is successful	3.64	3.52
The workload is distributed evenly in my unit	2.14	3.55
Overall	3.36	3.57
<b>Motivating Factors of Work</b>		
My work is interesting	3.74	3.74
I appreciate my own work	4.14	3.98
I can apply a wide range of my skills and expertise in my work	3.6	3.84
My work tasks are suitably challenging	3.37	3.68
Overall	3.71	3.81
<b>Working Environment</b>		
My unit has appropriate equipment to ensure quality of care	4.17	3.68
My work unit is comfortable	3.94	3.58
My work unit is safe and secure	4.36	3.77
Overall	4.17	3.68
<b>Working Welfare</b>		
I look after my personal well being	3.9	4.10
I am happy with my current health	4.03	3.87
I am active in developing myself professionally	4.1	4
I feel I am a competent student nurse	3.53	3.68
Overall	3.89	3.91
<b>Sense of Community</b>		
I trust the expertise of my classmates	4.13	3.81
There is a good community spirit in my unit	4.07	3.90
The flow of information works well in my unit	3.87	3.84
Overall	4.02	3.85

Legend: "1.00-1.50 Strongly Disagree", "1.51-2.50 Partly Disagree", "2.51-3.50 Neither Agree Nor Disagree", "3.51-4.50 Partly Agree", "4.51-5.00 Strongly Agree".

idealistic mind that tends to get culture-shocked when they start working. New graduates are constantly looking for career advancement; most become impatient and transfer from one hospital to another. Hospital administrators are aware of the new challenges, the incoming generation of hospital workforce face gives them ample time to prepare solutions and programs to increase retention.

Satisfaction of students in terms of Working Environment has an overall weighted mean of 4.17 for students who didn't receive intervention interpreted as a "Partly agree" statement compared to the overall means of 3.68 of the group who used an acuity tool. Student nurses do not only focus on the tasks they have to do during their clinical exposure. The working environment including the

availability of needed medical equipment, having ample space to work on their nursing responsibilities and paperworks, good ventilation, comfort, and safe surroundings matter to these young minds as well. Technology that can promote healthcare efficiency, safety, quality, and cost (Rajeswaran, 2016) greatly influences workplace satisfaction as part of the care the students can provide for their patients. This aspect is also challenging for hospitals in the developing world. A study aligned staff satisfaction directly with organizational support provided by hospitals on factors like identifying and implementing proactive strategy to reduce adverse events, nurses' decreased job satisfaction and emotional exhaustion. This then necessitates

**Table 3.** Significant Difference between Level of Satisfaction of Students using Conventional Method and PAT based on indicators

Indicators	Tool	Mean	t-value	p-value
Requiring Factors of Work	Conventional	3.36	-0.899	0.372
	Acuity	3.57		
Motivating Factors of Work	Conventional	3.71	-0.376	0.694
	Acuity	3.81		
Working Environment	Conventional	4.17	1.994	0.052
	Acuity	3.68		
Working Welfare	Conventional	3.89	-0.100	0.921
	Acuity	3.91		
Sense of Community	Conventional	4.02	0.728	0.469
	Acuity	3.85		

Note: "Reject  $H_0$  if  $p$ -value is less than 0.05 level of significance, otherwise, Failed to Reject  $H_0$ ";  $p < 0.05$ ; SD = standard deviation;  $dF$  = degree of freedom;  $p$  = confidence interval

**Table 4.** Difference of Total Satisfaction Scores of Student Nurses after using PAT and Conventional Method of Patient Assignment

Test	Control		Experimental		t-test		
	Mean	SD	Mean	SD	t	dF	p
Modified KUHJSS	3.75	0.51	3.74	0.96	-0.067	46	0.947

leaders to focus on improving the work environment, which significantly affects nurse workloads and satisfaction. These factors may not be touched since the investigators have used digital simulation of their clinical rotation.

Satisfaction of students in terms of Working Welfare has an overall weighted mean of 3.89 interpreted as a "Partly agree" statement, in comparison with students who underwent intervention, overall mean showed a slight difference, 3.91. There is a vast amount of literature on the causes of anxiety in nurse education (Powell-Cope et al., 2008). It was recorded that compared to other health fields and the general population; student nurses have a higher level of stress (Prymachuk & Richards, 2007). Competence can also influence student's working welfare as they see themselves developing professionally. When nurses can apply their skills and expertise in care for the patients, they are more satisfied. This is congruent to another study where participants improved safety and effectiveness of the work they perform because of competency-based management wherein talents and skills can be applied to wider and broader range in clinical areas (Nurumal et al., 2020b; Por et al., 2011). A study showing 50% of participants recognizing themselves as competent and 47.8% of student nurses particularly competent in the clinical setting noted that fewer students in the clinical area could lead to higher competence (Sherman & Eggenberger, 2009). Proper assignment of clients per student can greatly influence their competence and eventually their satisfaction. Level II students are still in their phase of adjustment, and if the students

feel that they are given the right number of tasks and patients that can improve their skills significantly, they can appreciate the clinical experience more. This can make them look forward to the next rotation as they perceive it as an excellent opportunity to gain more knowledge. There are more responsibilities and skills needed from Level III. However, this also gives them a greater sense of competence and prepares them for a higher learning degree.

Satisfaction of students in terms of Sense of Community has an overall weighted mean of 4.02, interpreted as a "Partly agree" statement; students who used the Patient Acuity Tool showed a slight decrease in mean scores with 3.85. Participants were able to apply various skills in the ward if there is a balanced workload rather than giving all workload to the one with the most experiences (Powell-Cope et al., 2008). It was noted that collaborative construction of knowledge and verbalizing thought processes which can be gained during a contextualized learning experience can benefit a student's clinical reasoning skills (Yauri et al., 2019), granting students the ability to learn by watching their classmates perform procedures and trusting their classmates' expertise, it does not give the same satisfaction if they are doing the procedures themselves. The satisfaction can also be influenced by the strong teamwork of the level II and III batch, as seen in their curricular and extracurricular activities. Helping one another academically is also a common observation with the participants. These students have community spirit, and they also have a constant venue for keeping each other updated. Regardless, nurses demonstrated high satisfaction

in mentoring students but confessed to viewing this as extra work which can lower satisfaction.

The difference between total satisfaction scores of student nurses who used Patient Acuity Tool and Conventional Method is not significant. Similarly, workload and management tools like acuity-based staffing are not directly associated with staff satisfaction (Oermann, 1999). Massive workload, shortage in hospital staffing, busy wards, and excessive students' requirements are considered hindrances in students' training, affecting satisfaction.

## Conclusion

Contrary to a number of studies showing significant effects on nurses' overall satisfaction levels, the use of Patient Acuity Test is noted to have no effects on satisfaction. The results of the patient satisfaction yielded higher in terms of requiring factors of work, motivating factors of work, and working welfare to the participants who used the Patient Acuity Tool during the simulation of patient distribution.

While the results showed an insignificant overall difference, these results could improve specific aspects of patient distribution, eventually enhancing students' satisfaction and learning methods. The common method of getting equal number of patients without considering the number of procedures done should be re-strategized and using the Patient Acuity Tool can address this issue. This shall give a new light on patient distribution highlighting that equity should be best considered over equality. The lowest score of 2.14 in the statement 'The workload is distributed evenly in my unit' given by those who have used the Conventional Method, compared to the 3.55 means score of those who utilized the Patient Acuity Tool, reflects an improvement in the main concern of this study.

The higher satisfaction levels in 3 individual indicators provide a promising foundation of the Patient Acuity Tool in promoting requiring factors, motivating factors, and most especially working welfare of nursing students, can be take into account to improve clinical rotation experience and satisfaction level.

The complex use of Patient Acuity Tool and the minimal time to learn and adapt to its use probably impacted the satisfaction levels. Nonetheless, the investigators recommend nursing educators to give an opportunity the use of Patient Acuity tool during patient distribution when students are conducting their clinical practicum.

The disruption of academic curriculum, which led the investigators to conduct web-based simulation might have also significantly eliminated important factors which only an actual clinical experience can provide. The faculty and administrators are encouraged to conduct further studies to assess Patient Acuity Tool's effects in implementing guidelines for assigning patients to students in an actual clinical setting.

Future researchers should consider Patient Acuity Tool's use across different year levels and in assigning patients in other clinical areas. A pretest-posttest design may be used for broader perspective or measurement of participants' level of satisfaction.

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# Antecedents of Psychological Empowerment and The Impact on Nurses Burnout

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## Abstract

**Background:** The health and well-being of nurses are deteriorating due to several factors such as complicated nursing practices, high patient demands, heavy workload, all of which result in frustration and lead to burnout, especially emotional exhaustion.

**Purpose:** The purpose of this study was to examine the effect of the antecedents of psychological empowerment on burnout in nurses who worked at the COVID-19 Hospital XYZ in Tangerang during the pandemic.

**Methods:** This research is a quantitative research with survey. PLS-SEM was used to analyse empirical data obtained through simple random sampling. There were 80 samples collected and analysed through questionnaire that had been distributed online. The results showed that six of the eight variables of quality of work life, as well as psychological empowerment mediating variables, had a significant negative effect on burnout (t-statistic > 1.645).

**Results:** The direct influence on psychological empowerment was found to be the strongest from the opportunity to develop human capital and adequate and fair compensation (coefficient: 0.627 and 0.361). It was found that there was a negative impact of psychological empowerment on burnout (-0.756), thus the results of this study support the theory that the quality of work life can increase psychological empowerment among nurses, as well as show a new application to the psychological empowerment of nurses.

**Conclusion:** This research model has moderate predictive accuracy and medium predictive relevance, so it can be developed in further research. There are managerial implications obtained from the findings of this study related to duration of work per week, work environment, granting of autonomy, as well as recommendations for future researchers regarding sample size and geographic coverage.

**Keywords:** burnout; COVID-19 pandemic; nurse; psychological empowerment; quality of work life.

## Introduction

In December 2019, an infection of unknown cause began in Wuhan, China causing tremendous attention (Catton, 2020). WHO experts confirmed that the pathogen is SARS-CoV-2, and the disease is called Coronavirus Disease 2019 or COVID-19 (Pan et al., 2020). The main route of transmission of the virus is through respiratory droplets and close contact, which makes nurses and doctors a high-risk population. Based on WHO-China expert team report, 2055 healthcare workers, consisting of 476 different hospitals, are suffered from Covid-19 (Liu et al., 2020). The number of patients continues to increase over time, this makes nurses and doctors must face an extraordinary workload and a high risk of exposure to infection, which leads to mental health problems such as anxiety and depression (Kang et al., 2020). Research shows that efforts to maintain the mental health of doctors and nurses can contribute positively to disease control (Chen et al., 2020). Nursing is a noble profession and plays an important role for health care and services in any countries. Nurses work with patients and doctors in serving patients. The

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role of nurses is very important, and their duties can be said to be innumerable (Khamisa, Peltzer, & Oldenburg, 2013). Nurses are required to have high physical and emotional resilience to deal with work-related problems so that they can work better (Schaufeli, 2006). During the COVID-19 pandemic, nurses experienced various challenges, namely fatigue, discomfort, anxiety, fear of contracting and stress (Wahyuningsih et al., 2020).

Hospitals currently rely on nurses in service quality because the hospital industry is experiencing intense competition. The quality of hospital services is an important issue in increasing patient satisfaction. Nurses as health care providers who in carrying out their duties continuously make good contact with patients, colleagues, superiors or with other members of the health team. Patients who are satisfied with the services provided are an asset. Therefore, it is necessary to have excellent health workers who can provide maximum service. In competitive conditions like this, hospital management must focus on achieving better things than other hospitals. Therefore, hospital management needs to pay attention to the quality of its workforce and not only from a physical point of view but also from a psychological aspect in order to create better services for patients.

XYZ Hospital is a private hospital located in Tangerang, Banten Province, Indonesia. XYZ Hospital is a type C hospital and functions to provide services for COVID-19 patients. The types of rooms provided by XYZ Hospital include intensive care rooms, treatment rooms for class 1, 2 and 3. The facilities provided by XYZ Hospital are ambulances,

diagnostic services, radiology, and laboratories. During the COVID-19 pandemic, XYZ Hospital has only received inpatient services for patients infected with COVID-19 and temporarily closed outpatient services. XYZ Hospital provides COVID-19 examination services such as antigen swab and polymerase chain reaction (PCR) examination. The main reason for choosing XYZ Hospital as the target of this research is because it is the first private hospital in Tangerang that dedicates itself to being the first COVID-19 referral hospital.

Currently, studies on the COVID-19 epidemic situation are more focused on epidemiological investigations, prevention and control, diagnosis, and treatment. Fewer studies have investigated the mental health problems of clinical medical workers during the COVID-19 epidemic. The health and well-being of nurses are deteriorating due to several factors such as complicated nursing practices, high patient demands, heavy workload, all of which result in frustration and lead to burnout, especially emotional exhaustion (Demerouti, Bakker, Nachreiner, & Schaufeli, 2000). This study aims to determine the effect of quality of work life on psychological empowerment of nursing staff at XYZ Hospital in 2021 and how psychological empowerment can affect burnout. Improvement for this condition in the future depends on the management of the hospital in determining the cause of burnout and providing the necessary working conditions to reduce the risk of burnout on nurses in the future.



Figure 1. Research Model  
Source: Permarupan et al. (2020)

**Table 1.** Conceptual Definition and Variable Operationalization

Variable	Conceptual Definition	Variable Operationalization	Source/ Scale
Adequate and Fair Compensation (AFC)	Salaries that meet general standards and are sufficient to meet a decent standard of living, and have the same ratio as the salaries earned by others in similar positions (Kanten and Sadullah, 2012).	<ol style="list-style-type: none"> <li>1. I feel that the salary (remuneration) I get is reasonable.</li> <li>2. I am satisfied with my salary compared to the salary of my colleagues.</li> <li>3. I feel that the bonuses/awards I have received (example: COVID incentives) from the hospital where I work have gone well.</li> <li>4. I feel that the additional benefits (e.g., education, courses, CME) from the hospital where I work are good.</li> </ol>	Walton (1975)  Likert Scale (1 to 5)
Constitutionalism in Work (CW)	The rights possessed by employees and how they can be used to protect employees (Kanten and Sadullah, 2012).	<ol style="list-style-type: none"> <li>1. I feel that the efforts of the hospital where I work in respecting workers' rights are appropriate.</li> <li>2. I feel that the freedom of expression (opportunity to express opinions) is going well in the hospital where I work.</li> <li>3. I feel that the norms and rules that apply in the hospital where I work are reasonable.</li> <li>4. I feel that the treatment by the hospital where I work for the characteristics and peculiarities of each individual worker is appropriate.</li> </ol>	Walton (1975)  Likert Scale (1 to 5)
Opportunity to Grow and Security (OW)	Availability of opportunities for advancement in the organization or career, and security of status or income related to work (Walton, 1975).	<ol style="list-style-type: none"> <li>1. I feel that the opportunities for growth in the hospital are good at this time.</li> <li>2. I feel that the training provided by the hospital where I work is going well.</li> <li>3. I feel that it is natural for workers to submit resignations at the hospital where I work.</li> <li>4. I feel that the support or opportunity provided by the hospital to study/continue education is going well.</li> </ol>	Walton (1975)  Likert Scale (1 to 5)
Safe and Healthy Working Conditions (WC)	A safe and healthy environment for employees related to comfort in terms of physical and health (Kanten and Sadullah, 2012).	<ol style="list-style-type: none"> <li>1. I feel the weekly working hours (number of hours worked/shift) of my job are reasonable.</li> <li>2. I feel my current workload is reasonable.</li> <li>3. I feel that the use of technology in my work is going well.</li> <li>4. I feel that the health in the hospital where I work (example: cleanliness) is decent.</li> <li>5. I feel that the safety equipment, PPE, and protection provided by the hospital are adequate.</li> <li>6. I feel that the fatigue caused by my job is normal.</li> </ol>	Walton (1975)  Likert Scale (1 to 5)
Opportunity to Develop Human Capital (UCW)	Human capacity development which shows the provision of a work environment that facilitates workers to get opportunities and gain autonomy (Kanten and Sadullah, 2012).	<ol style="list-style-type: none"> <li>1. I feel that the autonomy (opportunity to make decisions) that I have in the hospital is natural.</li> <li>2. I feel the tasks / work / activities that I do are important.</li> <li>3. I feel that it is normal to do several tasks at the same time.</li> <li>4. I feel that the performance appraisal system in the hospital is running well.</li> <li>5. I feel the responsibility given to me is reasonable.</li> </ol>	Walton (1975)  Likert Scale (1 to 5)

## Methods

This research is a cross-sectional, quantitative study with hypothesis testing, correlational, non-causation design, and also non-interventional study which means that there are no interventions assigned. The research focused on XYZ Hospital in Tangerang,

Banten Province, which is a type C hospital which has served to provide services for COVID-19 patients since the pandemic. Prior to the questionnaire distribution, the hospital management has granted permission to collect data. Based on the theory of quality of work life, it is known that compensation, constitution, opportunities, workplace conditions,

**Continue Table 1.** Conceptual Definition and Variable Operationalization

Variable	Conceptual Definition	Variable Operationalization	Source/ Scale
Social Integration at Work (SIW)	Important component related to how employees have the feeling of ownership of the company (Kanten and Sadullah, 2012).	<ol style="list-style-type: none"> <li>1. I feel that the treatment for social, racial, religious, gender, and others in the hospital where I work is appropriate.</li> <li>2. I feel that my relationship with co-workers and superiors is going well.</li> <li>3. I feel that the commitments made by my team and colleagues have gone well.</li> <li>4. I feel that the acceptance or appreciation given to me when conveying ideas and initiatives is appropriate.</li> </ol>	Walton (1975)  Likert Scale (1 to 5)
Social Relevance and Importance of Work (SRI)	The attitude of responsibility given by the company in maintaining the quality of working conditions socially (Kanten and Sadullah, 2012).	<ol style="list-style-type: none"> <li>1. I feel proud of the work I do.</li> <li>2. I feel that the image of the hospital in the community is good.</li> <li>3. I feel that the contribution of the hospital where I work to the community is good.</li> <li>4. I feel that the services provided by the hospital where I work are reasonable.</li> <li>5. I feel that the way employees are treated at the hospital where I work is appropriate.</li> </ol>	Walton (1975)  Likert Scale (1 to 5)
Work and Life Span (OSW)	The balance of a person's work role with their life (Walton, 1975).	<ol style="list-style-type: none"> <li>1. I feel the influence of my work on my family and routine are reasonable.</li> <li>2. I feel the influence of my work on my free time is reasonable.</li> <li>3. I feel that the division of my work schedule and rest time is good.</li> </ol>	Walton (1975)  Likert Scale (1 to 5)
Psychological Empowerment (PE)	Employees' perceptions of control over their work environment and congruence between values and beliefs related to their work, and those of their employers (Spreitzer, 1995).	<ol style="list-style-type: none"> <li>1. The work I do is important to me.</li> <li>2. My work activities are meaningful to me personally.</li> <li>3. The work I do is valuable to me.</li> <li>4. I believe that I could do my job.</li> <li>5. I feel confident in my ability to carry out my work activities.</li> <li>6. I have mastered the skills required for my job.</li> <li>7. I have autonomy in determining how I do my job.</li> <li>8. I can decide for myself how to do things related to my work.</li> <li>9. I have ample opportunities to carry out my work-related activities independently.</li> <li>10. I have a big impact on the hospital where I work.</li> <li>11. I have a lot of control/control over what happens at the hospital where I work.</li> <li>12. I have a significant influence over what happens at the hospital where I work.</li> </ol>	Spreitzer (1995)  Likert Scale (1 to 5)

working period and integration and social relevance of the workplace play an important role. The quality of work life component affects the psychological empowerment of employees (Salimi & Saeidian, 2015). Informed consent was obtained from the respondents and ethical clearance was not required in the process of this study.

In this research model, the psychological empowerment variable is tested for its impact on burnout as the dependent variable of the study. This study uses a research model that has been carried out by previous researchers (Permarupan et al., 2020), which tested empirically on nurses

who provide services to patients with suspected or confirmed COVID-19 at XYZ Hospital in Tangerang. The objects in this study are all variables included in this research model. The dependent variable of this research is burnout, while psychological empowerment is a mediating variable. Data obtained from individuals are considered as the unit of analysis of the study. The respondent's two mandatory criteria must be met: first, the respondent is a full-time nurse, second, the respondent performs care or services for COVID-19 patients. The reason for choosing nurses as the unit of analysis is because nurses have more time to interact with COVID-19

**Continue Table 1.** Conceptual Definition and Variable Operationalization

Variable	Conceptual Definition	Variable Operationalization	Source/ Scale
Burnout (NB)	Emotional exhaustion syndrome that is common among individuals characterized by increased feelings of emotional exhaustion (Maslach & Jackson, 1981).	<ol style="list-style-type: none"> <li>1. I feel emotionally drained as a result of my job.</li> <li>2. I feel tired at the end of my shift.</li> <li>3. I feel tired when I wake up in the morning and must face the same work.</li> <li>4. Working with the people in this hospital all day is a burden for me.</li> <li>5. I often feel frustrated with my work.</li> <li>6. I have a hard time understanding how my patients feel.</li> <li>7. I feel I am handling patient problems ineffectively.</li> <li>8. I feel low on energy when I am on duty.</li> <li>9. I feel depressed after working with patients.</li> <li>10. I feel I treat my patients as if they were just 'objects'.</li> <li>11. I have become more insensitive to people since I worked during the COVID-19 pandemic.</li> <li>12. I don't really care about the patient's feelings.</li> <li>13. I feel that patients often blame me for their complaints.</li> </ol>	<p>Maslach (1981)</p> <p>Likert Scale (1 to 5)</p>

patients than other health workers, and because there are not many studies using this type of respondent during the COVID-19 pandemic period. This study used an ordinal scale to determine the differences between each construct and facilitate the conversion of data obtained from questionnaire using a Likert scale into numeric form.

The population of this study are all full-time nurses who work at XYZ Hospital and provide services to patients suspected of or confirmed COVID-19 at XYZ Hospital in Tangerang in 2021. The samples in this study are nurses who work full time at XYZ Hospital and provide services or have a close contact with a patient suspected of being infected with the COVID-19 virus. Sampling was carried out in March – April 2021 in conditions of the COVID-19 pandemic. To calculate the number of samples needed in a known population, this study used the calculation method of [Krejcie and Morgan \(1970\)](#). The research sample that meets the requirements is a total of 80 respondents. The sampling method of this research is simple random sampling. Respondents who have met the initial criteria will be sent a link to a questionnaire that can be filled out online. This research data analysis method uses multivariate analysis because of the complexity of the research model and the use of latent variables or constructs ([Sekaran & Bougie, 2016](#)).

There are ten variables with nine paths and there is one mediating variable. Therefore, we need a method that can test the effect between variables simultaneously to the dependent variable. Researchers use the PLS-SEM analysis method because the structural model is complex and includes many indicators and model relationships and is theory development in exploratory research and can provide explanation and predictive abilities

for further development ([Hair et al., 2019](#)). There are two types of models produced by PLS-SEM analysis, namely the outer model and the inner model. The outer model or measurement model examines the relationship between indicators and construct variables, which includes two parts, namely reliability testing and validity testing. The reliability testing phase includes indicator reliability (outer loading), and construct reliability (Cronbach's alpha and composite reliability). The validity testing phase includes construct validity (average variance extracted) and discriminant validity (heterotrait-monotrait ratio). If these four things have met the requirements of reliability and validity, it can proceed to the next stage.

Next is the inner model or structural model that provides the relationship between the constructs in the research model, assesses the quality of the model and tests the significance of the effect and coefficient analysis. The first step of this model is multicollinearity testing, based on the value of the variance inflation factor (VIF). The second step is to determine the explanatory and predictive abilities of the research model using the determinant coefficient or R<sup>2</sup> which ranges between 0 and 1 where higher results indicate higher accuracies and predictions. These results can be divided into three levels, namely 0.75, 0.5 and 0.25 or called substantial, moderate, and weak ([Hair et al., 2019](#)). The third is the assessment of the predictive ability of a model if there is a change in the data with Q<sup>2</sup> or predictive relevance. A Q<sup>2</sup> predict value that is more than zero indicates that the model has a good prediction if there is a change in data during its analysis. On the other hand, a Q<sup>2</sup> predict value that is less than zero indicates that the model has no relevant predictions.

The next stage is the stage of testing the hypothesis obtained from the bootstrapping or

resampling menu on SmartPLS. This is done by looking at two assessments. The first assessment is the significance of the relationship between variables using the T-table value with T-statistics. If the T-statistic has a higher value than the T-table, then the effect of the variable is declared significant. On the other hand, if the T-statistic value has a lower value than the T-table, then the effect of the variable is declared insignificant. This study uses a significance level of 0.05, and the degree of freedom is classified as infinity, so the T-table value for the one-tailed test is 1.645 (Beyer, 2017). The second assessment is path analysis to see the strength of the pathway through the mediating variable, and to see the mediating ability of the research mediation variable by looking at the specific indirect effect. The last stage of SmartPLS analysis uses Importance Performance Map Analysis (IPMA) to see the combination of descriptive analysis with inferential analysis. The combination of the two analyses is depicted in a two-axis mapping that

shows the position of variables and indicators based on the mean (descriptive analysis) and total effect (inferential analysis) in the figure (Sarstedt, 2017). IPMA can provide a practical overview of what needs to be improved.

## Results

From as many as 80 respondents who have met the research criteria, the profile of respondents are as follows table 2.

The table above shows that the respondents are divided into the ages of 20 to 50 years and from the data it can be assumed that the respondents already have emotional maturity. most respondents have educational background of professional and vocational nursing education which continued with S1 and Diploma. With this background, respondents are considered competent and able to understand the questions in the questionnaire well. For the length of time working as a nurse, various results

**Table 2.** Respondents Demographic Profile

Description	Category	Quantity	%
Employment Status	Full Timer	80	100
	Part Timer	0	0
	Total	80	100
Gender	Female	64	80
	Male	16	20
	Total	80	100
Age	< 20	0	0
	21 – 30	64	80
	31 – 40	15	18.75
	41 – 50	1	1.25
	51 – 60	0	0
	Total	80	100
Last Education	Highschool	0	0
	Diploma	12	15
	S1	25	31.25
	Profession	43	53.75
	Total	80	100
Work Experience as Nurse	< 1 Year	11	13.75
	1 – 2 Years	17	21.25
	2 – 3 Years	22	27.50
	3 – 4 Years	8	10
	4 – 5 Years	4	5
	5 – 6 Years	5	6.25
	6 – 7 Years	4	5
	7 – 8 Years	2	2.50
	8 – 9 Years	2	2.50
	9 – 10 Years	2	2.50
	> 10 Years	3	3.75
	Total	80	100

**Continue Table 2.** Respondents Demographic Profile

Description	Category	Quantity	%
Department	Intensive Care Unit	19	23.75
	Regular Ward	58	72.50
	ICU and Regular Ward	3	3.75
	Total	80	100
Work Duration (Per Week)	35 – 42 Hours	45	56.25
	43 – 50 Hours	35	43.75
	> 50 Hours	0	0
	Total	80	100
Previous History of Working in Other Hospital	Yes	49	61.25
	Never	31	38.75
	Total	80	100
Diagnosed or Confirmed COVID-19 Infection	Yes	13	16.25
	Never	67	83.75
	Total	80	100

**Table 3.** Discriminant Validity

Variable	Adequate & Fair Compensation	Burnout	Constitution in Work	Opportunity to Develop Human Capital	Opportunity to grow and security	Psychological Empowerment	Safe & Healthy Working Conditions	Social Integration in Work	Social Relevance of Work	Work and Life Span
Adequate & Fair Compensation										
Burnout	0.590									
Constitution in Work	0.751	0.493								
Opportunity to Develop Human Capital	0.794	0.480	0.819							
Opportunity to grow and security	0.804	0.665	0.695	0.743						
Psychological empowerment	0.726	0.768	0.691	0.519	0.699					
Safe & Healthy Working Conditions	0.697	0.532	0.762	0.787	0.656	0.658				
Social Integration in Work	0.755	0.635	0.813	0.800	0.775	0.734	0.822			
Social Relevance of Work	0.808	0.610	0.692	0.780	0.702	0.620	0.683	0.728		
Work and Life Span	0.550	0.458	0.427	0.501	0.414	0.396	0.532	0.476	0.600	

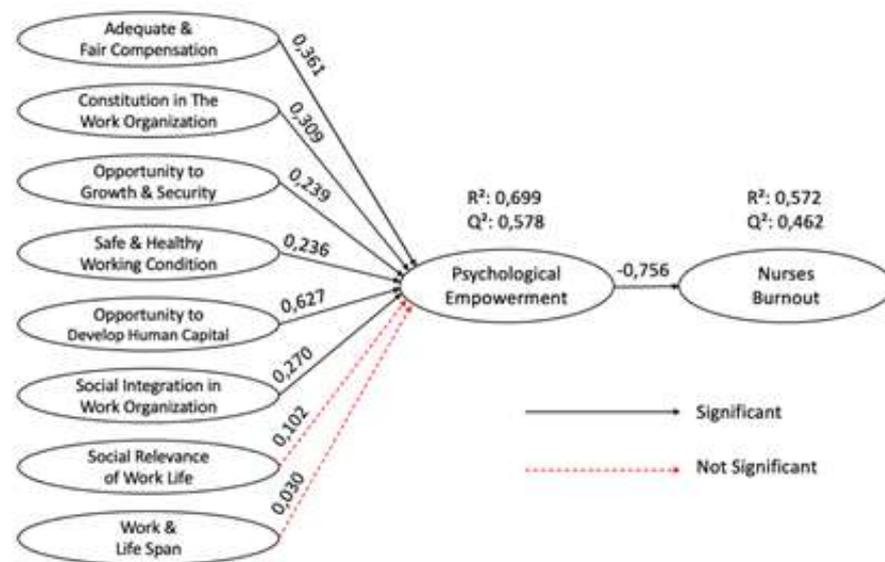
were found, but mostly the results were two to three years. Most respondents work in regular inpatient wards and some work in intensive care units. This information can provide an overview of the profiles of respondents involved in handling COVID-19 based on the degree of severity. In terms of duration of work, respondents are divided into working with a duration of 35-42 hours per week and 43-50 hours per week. This can affect the level of stress experienced by respondents in terms of workload and duration of work experienced. Hospital management needs to pay attention to the workload experienced by each nurse to create equality, as well as looking at the workforce patterns of nurses. Most of the respondents had worked elsewhere before and

some had never worked elsewhere. This may affect the comparison of the quality of work experienced by respondents in the old workplace. Finally, most respondents have never been confirmed with COVID-19 and some of them have been confirmed to be infected with COVID-19. Seeing this, hospital management needs to pay attention to the availability of personal protective equipment (PPE) and the safety of the work environment in order to protect nurses in doing their jobs.

It can be seen from the table above that the results of the discriminant validity test were carried out where the heterotrait-monotrait ratio (HT/MT) of each variable was below 0.9. It can be concluded that all indicators in this research model have been

**Table 4.** Hypothesis Test Results

No.	Path	Standardized Coefficient	T-statistic	Significance	Result
H1	Adequate and Fair Compensation -> Psychological Empowerment	0.361	2.616	Significant	Hypothesis supported
H2	Constitution in Work -> Psychological Empowerment	0.309	2.559	Significant	Hypothesis supported
H3	Opportunity to Grow and Security -> Psychological Empowerment	0.239	2.051	Significant	Hypothesis supported
H4	Opportunity to Develop Human Capital -> Psychological Empowerment	0.627	4.657	Significant	Hypothesis supported
H5	Social Integration in Work -> Psychological Empowerment	0.270	1.926	Significant	Hypothesis supported
H6	Social Relevance in Work -> Psychological Empowerment	0.102	0.792	Not Significant	Hypothesis not supported
H7	Safe and Healthy Working Conditions -> Psychological Empowerment	0.236	1.974	Significant	Hypothesis supported
H8	Work and Life Span -> Psychological Empowerment	0.030	0.352	Not Significant	Hypothesis not supported
H9	Psychological Empowerment -> Burnout	-0.756	12.679	Significant	Hypothesis supported

**Figure 2.** Empirical Model

well discriminated against and can measure their respective constructs. Each indicator can accurately and specifically measure its construct. There are four parameters of reliability and validity testing of the outer model above, namely the reliability indicator (outer loading), construct reliability (Cronbach's alpha and composite reliability), construct validity (average variance extracted), and discriminant validity (heterotrait-monotrait ratio). The model of this study has reliable and valid indicators to measure each construct specifically and can proceed to the

next analysis stage, namely the inner model test (structural model). The next stage is a significance test on nine paths to see whether the significance of the influence between variables in the model can be generalized at the population level. For this reason, bootstrapping is carried out by re-sampling on SmartPLS.

The table of hypothesis test results above shows that of the nine hypotheses in the research model tested, seven hypotheses were proven to be significant and have a direction in accordance with

the direction of the proposed hypothesis, so it can be said that the seven hypotheses are supported. However, two hypotheses were not supported since they were not significant although having the same direction. The description for each hypothesis can be described by the following model [figure 2](#).

## Discussion

It is known that from the nine paths tested, seven of them were proven to be significant and have influences on accordance with the direction of the hypothesis so that it can be said that the hypothesis is supported, while two of them are not significant so that it can be said that the hypothesis is not supported. This research model can be applied and tested on a wider population based on its geographical coverage. Structural model analysis gives the result that this research model has moderate predictive accuracy and medium predictive relevance on the dependent variable of burnout and the mediating variable of psychological empowerment. Therefore, this research model can be further developed with a larger sample size and apply more rigorous respondent criteria to obtain more predictive results.

The six independent variables in this model have significant influences with the strongest one being derived from the opportunity to develop human capital on psychological empowerment (0.627). Furthermore, the results of the analysis of specific indirect effects also show that the path that has the greatest influence from the independent variable to burnout also comes from the opportunity to develop human capital. [Walton \(1975\)](#) explains that the opportunity to develop human capital is part of the factors that are relevant to the development of workers' abilities, such as: granting certain autonomy, the use of skills from workers, knowledge of the ongoing process to carry out tasks and having a prior plan. Factors related to autonomy and the feasibility of assigning assignments and performance appraisals are very important for nurses who work in hospitals, so hospital management needs to prioritize this. This performance is also relevant to the conditions of the COVID-19 pandemic where the workload given is different from usual and the performance assessment is also different in hospitals. Other studies support that workload is significantly associated with nurse burnout, where high workload increase burnout risk in nurse ([Ramdan & Fadly, 2016](#)). These results are also supported by other studies which state that giving job autonomy, psychological empowerment and justice to workers will increase their commitment and ultimately their turnover intention will be lowered. This will help the organization to retain the workforce. Psychologically empowered individuals have a higher sense of ability, control, and competence ([Butt et al., 2017](#)).

The second variable that is no less important is adequate and fair compensation (0.361). This finding is in line with other studies which say that

adequate compensation for workers has a positive effect on workers' job and their psychological condition ([Khamisa et al., 2013](#)). Adequate and fair compensation is the salary earned by employees to meet the generally accepted standard of salary and is sufficient to meet a level of living that is said to be decent and has the same ratio as the salary received by other people in the same position ([Kanten & Sadullah, 2012](#)). Factors related to salary and incentives or awards are the second most important thing that nurses pay attention to in hospitals.

Other findings from this study also show the importance of the variables studied and show significant results to be prioritized by hospital management to improve nurse performance. The mediating variable used, namely psychological empowerment, has been shown to have a significant effect in reducing the occurrence of burnout and is able to mediate the effect of independent variables and these findings are in line with previous research related to quality of work life and psychological empowerment on burnout in nurses ([Permarupan et al., 2020](#)). These results are also supported by other studies which state that psychological empowerment can reduce stress and bring positive changes to the nurse's work environment ([Maslach & Leiter, 2016](#)). Psychological empowerment is a state of mind associated with developing perceptions in the workplace and providing the necessary energy for individuals to perform at their full capacity for organizational well-being ([Spreitzer, 2008](#)). Nurses want to grant an autonomy to make decisions and get a reasonable workload with proper compensations. Such situation should be facilitated to prevent burnout or fatigues among nurses which could hamper many services in hospital. Burnout refers to a mental state that develops over a certain period in a work environment with constant stress related to the demands of the job.

## Conclusion

Seven out of nine hypotheses were proven to be supported with significant and appropriate direction of influence. This research model has moderate predictive accuracy and medium predictive relevance on the burnout dependent variable. Therefore, this research is feasible to be conducted, thus required further research development. Based on the results of the study, the opportunity in developing human capital has a strong influence on the psychological empowerment of nurses. This is related to providing a work environment that facilitates nurses to get opportunities and proper autonomy. Therefore, hospital management needs to pay more attention to this matter. Hospitals need to provide equal opportunities for each nurse, as well as giving them the authority to access information related to their duties, and the opportunity to make decisions related to their daily work. In the aspect of psychological empowerment of nurses, it was found that the sense of importance has a very important role, especially

the feeling of having an influence on what happens in the hospital where the nurse works.

In the aspect of nurses' fatigue, it was found that the provision of a work environment that facilitates nurses to get opportunities and autonomy plays a high role in reducing nurses' fatigue levels. Hospital management can pay attention to the autonomy that nurses deserve. Hospitals also need to periodically evaluate the existing evaluation system in the hospital to make sure it is running properly and correctly. Management also needs to adjust nurses' workloads for reducing fatigues or exhaustions. By doing so, nurses can maintain their optimal performance. Research related to human resource development (HR) in healthcare professional during the COVID-19 pandemic is relatively rare. This is an opportunity to further deepen aspects related to this matter so that it can be developed into an opportunity to provide better services to patients and the community.

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# Multidimensional Symptom Burden among Patients with Hemodialysis in Indonesia

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## Abstract

**Background:** Patients with hemodialysis commonly experience multiple symptoms. Most of the previous studies analyzed the symptoms as one dimension such as the severity dimension. Conducting the comprehensive symptom assessment among patients with hemodialysis is necessary to gain a better understanding of the symptom burden.

**Purpose:** The aim of this study was to identify symptom burden among patients with hemodialysis comprehensively.

**Methodss:** This study was a descriptive study. A convenience sample of 320 patients undergoing hemodialysis was recruited from the dialysis units at two referral hospitals in Indonesia (Fatmawati Hospital and Cipto Mangunkusumo National Hospital). Indonesian Version of Chronic Kidney Disease – Symptom Burden Index (CKD-SBI) was used. For the data analysis, descriptive analysis was used.

**Results:** Total 320 subjects were collected. This study found that lack of energy was the highest physical symptom burden under 4 dimensions: occurrence 269 (84.0%), severity (mean = 4.28, SD = 3.08), distress (mean = 4.42, SD = 3.09), and frequency (mean = 4.41, SD = 3.27). Furthermore, decreased interest in sex was the highest psychological symptom burden under for dimensions: occurrence 210 (65.6%), severity (mean = 3.39, SD = 3.38), distress (mean = 2.92, SD = 2.99), frequency (mean = 3.70, SD = 3.65).

**Conclusion:** Lack of energy and decreased interest in sex were consistently the highest symptom burden among patients with hemodialysis. Creating appropriate interventions and managing the symptoms experienced by patients with hemodialysis comprehensively is very important to improve their quality of life

**Keywords:** chronic kidney disease; hemodialysis; symptom burden.

## Introduction

Patients with chronic kidney disease (CKD), as well as patients on haemodialysis, commonly experience multiple symptoms such as fatigue, pain, sexual problems, itching, nausea, vomiting, sleep disorders, and poor appetite (Almutary, Bonner, & Douglas, 2016; Murtagh, Sheerin, Addington-Hall, & Higginson, 2011; Thong et al., 2008). Symptoms among patients with haemodialysis are caused by uraemia, which is characterized by the accumulation of toxins in the blood due to the decline of kidney function (Vadakedath & Kandi, 2017). Among patients on haemodialysis, multiple symptoms exert a total symptom burden. The symptom burden commonly causes negative experience related to physical, psychological, and emotional (Gapstur, 2007). The number of symptoms among patients with

chronic kidney disease approximately ranged from 6 until 20 (Almutary, Bonner, & Douglas, 2013).

The majority of the previous studies assessed symptoms as one dimension such as the severity dimension (Lee & Jeon, 2015; Shim & Cho, 2018). Whereas symptoms are better understood if captured comprehensively (Almutary, Douglas, & Bonner, 2016; Lenz, Pugh, Milligan, Gift, & Suppe, 1997). The comprehensive symptom assessment consists of two symptom domains (physical and psychological), and consists of four symptom dimensions (occurrence, frequency, severity, and distress) (Almutary et al., 2016; Lenz et al., 1997). Therefore, a valid, comprehensive measurement involving multidimensional aspects of the symptom burden is necessary to gain a better understanding of symptom burden among people with CKD, especially patients undergoing hemodialysis. The presence of symptoms burden may affect the patient's quality of life (Thong et al., 2008). Comprehensive assessment is important for nurse as health care providers in terms of delivering appropriate interventions and for identifying priorities of nursing interventions which can improve better quality of life, especially when the disease has progressed to the advanced stage (Almutary et al., 2016). Almutary et al. (2016) reported physical symptom as the most demanding compared to psychological symptoms.

The number of patients who require haemodialysis in the world is 5.3 – 10.5 million in 2018 (International Society of Nephrology, 2018). Indonesian Renal Registry presented the number of patients on haemodialysis in Indonesia which increased rapidly from 52.8 thousand in 2016 to 77.8 thousand in 2017 (Indonesian Renal Registry, 2018). Due to the increasing number of patients on haemodialysis, conducting a study among this population is essential. Understanding comprehensive symptom burden among patients on hemodialysis also facilitates effective care plans and nursing interventions which can improve better quality of life of patients on hemodialysis.

## Methods

### Design and Sampling

In this study, the researcher utilized a descriptive study. The subjects were patients on hemodialysis. The number of samples is calculated by using rule of thumb 10 observations per variable (Comrey & Lee, 1992). There are 32 items in the questionnaire used by the authors, thus the total sample was 320 patients. The samples were obtained from the hemodialysis unit in Fatmawati Hospital and Cipto Mangunkusumo Hospital by using convenience sampling technique. The inclusion criteria for this study were patients above 18 years old who regularly received hemodialysis for three months or more. Meanwhile, the exclusion criteria were patients with

cognitive impairment, psychiatric patients, and in critical conditions.

### Instruments

Research instruments in this study included demographic data and Chronic Kidney Disease Symptom Burden Index (CKD – SBI). The questionnaires were administered by the researcher during dialysis time. Demographic form consisted of 9 variables involving age, gender, education, marital status, duration of hemodialysis (month), employment status, comorbidities, and body mass index (BMI) utilized. Age and duration of hemodialysis was measured as continuous data. In the description of patient characteristics, gender, education, marital status, employment status, and BMI were measured as categorical data. Gender was divided into male and female. Education level was divided into elementary school, junior high school, senior high school, and university. Marital status was categorized into married, single, and widow. Employment status was divided into work, no work, and retired. BMI was categorized based on WHO regulation involving underweight (below 18.5), normal (18.5 – 24.9), overweight (25 - 29.9), and obesity (above 30) (WHO, 2020). For comorbidities, all comorbid disease would be measured by using the Charlson comorbidity index (CCI).

CKD Symptom Burden Index (CKD-SBI) questionnaire was used to identify symptom burden in patients on hemodialysis during the previous 4 weeks. CKD-SBI consisted of 32 questions which measured four dimensions of symptoms (occurrence, frequency, severity and distress). Firstly, patients were asked about occurrence of symptoms with yes or no question. If the patients answered yes, then the patients should continue to answer frequency, severity, and distress dimensions. If the patients answered no, they did not need to continue to other dimensions (Almutary, Bonner, & Douglas, 2015).

Higher score indicated higher symptom occurrence. For occurrence, no answer was equal to 0, and yes answer was equal to 1. Thus, the possible range for occurrence was 0 to 32. Furthermore, the frequency, severity, and distress of symptoms were measured with numerical rank scoring from 0-10. Participants rate frequency dimension ranged from never to constant, severity dimension from none to very severe and distress dimension from none to very much. Possible range for severity, distress, and frequency was 0 – 320, respectively. The total CKD-SBI score was calculated by summing the scores of occurrences, distress, severity, and frequency dimensions of CKD-SBI, and the result was multiplied with the constant number (0.1008). The total score ranged from 0-100, and 100 indicated the highest symptom burden possible. Cronbach's alpha for CKD-SBI English version was 0.91 (Almutary et al., 2015). CKD-SBI was available in English and Arabic language only. Thus, the cross-cultural translation was conducted by adapting Guillemín

and Beaton's guidelines. The validity was checked using item content validity index (I-CVI) and scale content validity index (S-CVI). The score for I-CVI was 0.92, and S-CVI was 0.78. The Cronbach's alpha for Indonesian version was 0.95.

### Ethical Consideration

The ethical approval and permission of this study was obtained from Fatmawati Hospital and Cipto Mangunkusumo National Hospital. The number of ethical approval from the Institutional Review Board (IRB) was ND-1020/UN2.F1/ETIK/PPM.00.02/2019. The number of approval research permission from Fatmawati hospital was DM 01.01/VIII.2/9375/2019, and from Cipto Mangunkusumo National Hospital was LB/1.4.12/0118/2020. Ethical consideration was followed by the researcher and research assistants including informed consent, autonomy, anonymity, beneficence, and justice (Polit & Beck, 2012). Firstly, the researcher gave the information clearly to the subjects about the title, purpose of study, procedures, the mechanism of protecting subject

personal data and rights. After informed consent, the subjects could decide whether they would join in this study or withdraw anytime. If the subjects decided to participate, subjects then filled the questionnaire. After the subjects filled the questionnaire, the researcher checked for the completeness. Only complete questionnaires were used in data analysis. The researcher protected the data from any interest or harm by using coding system in data analysis to protect the subject privacy. Subjects received the same treatment from the researcher through the study although they might have a different belief, culture or religion among each other.

### Data Collection Procedures

The researcher recruited one research assistant to collect the data. Research assistant was a female nurse who graduated from university and had work experience in hemodialysis unit for more than 2 years. In the current study, the research assistant had working experience as a research assistant and had done data collection. The research assistant

**Tabel 1** Demographic Data

Variable	n (%)	Mean and SD
Gender		
Female	145 (45.3)	
Male	175 (54.7)	
BMI		
Underweight (below 18.5)	24 (7.5)	
Normal (18.5 – 24.9)	214 (66.9)	
Overweight ((25 – 29.9)	67 (20.9)	
Obese (30 and above)	15 (4.7)	
Marital Status		
Single	28 (8.7)	
Married	262 (81.9)	
Widow	30 (9.3)	
Education		
Elementary school	30 (9.3)	
Junior high school	28 (8.7)	
Senior high school	171 (53.4)	
University	91 (28.4)	
Work Status		
Not Work	192 (60.0)	
Work	79 (24.7)	
Retired	49 (15.3)	
Comorbidities (CCI)		
0	107 (33.4)	
1-2	142 (44.3)	
Above 3	71 (22.1)	
Age		51.50 ± 14.56
Duration		46.28 ± 43.76

**Table 2.** Symptom Burden Description (N = 320)

Symptom	Symptom Occurrence n (%)	Symptom Severity (mean $\pm$ SD)	Symptom Distress (mean $\pm$ SD)	Symptom Frequency (mean $\pm$ SD)
Constipation	152 (47.5)	1.67 $\pm$ 2.24	1.84 $\pm$ 2.48	1.83 $\pm$ 2.61
Nausea	195 (60.9)	2.27 $\pm$ 2.56	2.46 $\pm$ 2.73	2.22 $\pm$ 2.54
Vomiting	127 (39.6)	1.30 $\pm$ 2.13	1.42 $\pm$ 2.25	1.16 $\pm$ 2.11
Diarrhoea	84 (26.2)	0.81 $\pm$ 1.70	0.82 $\pm$ 1.68	0.65 $\pm$ 1.29
Decreased appetite	165 (51.5)	2.11 $\pm$ 2.63	2.22 $\pm$ 2.70	2.17 $\pm$ 2.76
Muscle cramps	200 (62.5)	2.52 $\pm$ 2.57	2.69 $\pm$ 2.71	2.20 $\pm$ 2.29
Swelling in legs	145 (45.3)	1.53 $\pm$ 2.12	1.68 $\pm$ 2.30	1.54 $\pm$ 2.16
Shortness of breath	176 (55.0)	2.42 $\pm$ 2.76	2.59 $\pm$ 2.91	2.01 $\pm$ 2.91
Dizziness	222 (69.3)	2.74 $\pm$ 2.49	2.90 $\pm$ 2.60	2.82 $\pm$ 2.96
Restless legs	128 (40.0)	1.26 $\pm$ 1.86	1.34 $\pm$ 1.95	1.24 $\pm$ 1.89
Numbness or tingling	165 (51.5)	1.86 $\pm$ 2.21	1.98 $\pm$ 2.36	1.96 $\pm$ 2.49
Lack of energy	269 (84.0)	4.28 $\pm$ 3.08	4.42 $\pm$ 3.09	4.41 $\pm$ 3.27
Cough	179 (55.9)	1.91 $\pm$ 2.19	2.10 $\pm$ 2.38	1.87 $\pm$ 2.25
Dry mouth	189 (59.0)	1.97 $\pm$ 2.09	2.09 $\pm$ 2.23	2.59 $\pm$ 2.95
Bone or joint pain	220 (68.7)	3.12 $\pm$ 2.77	3.26 $\pm$ 2.85	3.19 $\pm$ 3.08
Chest pain	140 (43.7)	1.54 $\pm$ 2.12	1.62 $\pm$ 2.21	1.46 $\pm$ 2.06
Headache	189 (59.0)	2.39 $\pm$ 2.52	2.53 $\pm$ 2.65	2.19 $\pm$ 2.41
Muscle soreness	232 (72.5)	2.92 $\pm$ 2.51	3.10 $\pm$ 2.64	3.03 $\pm$ 2.71
Difficulty concentrating	134 (41.8)	1.48 $\pm$ 2.19	1.55 $\pm$ 2.30	1.52 $\pm$ 2.30
Dry skin	250 (78.1)	2.95 $\pm$ 2.40	2.97 $\pm$ 2.36	4.09 $\pm$ 3.39
Itching	190 (59.3)	2.43 $\pm$ 2.62	2.61 $\pm$ 2.79	2.52 $\pm$ 2.86
Worrying	174 (54.3)	2.31 $\pm$ 2.77	2.33 $\pm$ 2.79	2.12 $\pm$ 2.60
Feeling nervous	151 (47.2)	2.09 $\pm$ 2.77	2.15 $\pm$ 2.84	1.92 $\pm$ 2.64
Trouble falling asleep	202 (63.1)	3.13 $\pm$ 3.24	3.17 $\pm$ 3.25	3.33 $\pm$ 3.49
Trouble staying asleep	197 (61.5)	2.77 $\pm$ 3.06	2.81 $\pm$ 3.07	3.06 $\pm$ 3.43
Feeling irritable	135 (42.1)	1.79 $\pm$ 2.55	1.85 $\pm$ 2.62	1.74 $\pm$ 2.51
Feeling sad	132 (41.2)	1.89 $\pm$ 2.66	1.93 $\pm$ 2.72	1.76 $\pm$ 2.51
Feeling anxious	139 (43.4)	1.99 $\pm$ 2.71	2.08 $\pm$ 2.79	1.81 $\pm$ 2.52
Depression	39 (12.2)	0.48 $\pm$ 1.48	0.51 $\pm$ 1.55	0.40 $\pm$ 1.21
Decreased interest in sex	210 (65.6)	3.39 $\pm$ 3.38	2.92 $\pm$ 2.99	3.70 $\pm$ 3.65
Difficulty becoming sexually aroused	211 (65.9)	3.41 $\pm$ 3.36	2.94 $\pm$ 2.97	3.67 $\pm$ 3.65
Nocturia	149 (46.5)	1.20 $\pm$ 1.74	1.25 $\pm$ 1.82	3.67 $\pm$ 3.65
Overall subscale	171.5 (53.6)	69.94 $\pm$ 79.59	72.11 $\pm$ 81.71	71.93 $\pm$ 83.68
	Mean $\pm$ SD			
Total score CKD SBI	23.69 $\pm$ 12.27			

received the explanation about this study and went through three hours training on how to collect the data, how to approach the patients, and how to interpret the data. Then, the researcher collaborated with the research assistant to collect the data from each hospital. In August to January 2019, the data collection conducted from Fatmawati hospital and Cipto Mangunkusumo National hospital.

Before collecting the data, the researcher asked permission from the head nurse in the hemodialysis

unit and made a list of patient's names with their hemodialysis schedule. Both researcher and research assistant approached the patients who met with the inclusion criteria. Then, researcher visited hemodialysis unit based on the patient's schedule. The questionnaires were given in Indonesian language and expanded to the patients during dialysis time. Estimated time to complete the questionnaire was approximately 20 minutes per patient. Informed consent was given to the subjects

before they filled out the questionnaires.

### Data Analysis

The data from this research were analyzed using the Statistical Package for the Social Science (SPSS) version 17.00. Descriptions of demographic data and symptom burden were analyzed using descriptive analysis (univariate analysis). All categorical data are presented using a frequency distribution with totals and percentages and all continuous data are presented using the mean and standard deviation. BMI and duration were identified as categorical data in description data.

## Results

A total of 320 data from Fatmawati hospital and Cipto Mangunkusumo hospital were in accordance with the inclusion and exclusion criteria and were included in the data analysis. The results of data analysis were presented. Based on [Table 1](#), the majority of the sample was male ( $n = 175$ ; 54.7%), while the female population was only 45.3% ( $n = 145$ ). The result showed that most of the patients had a normal BMI ( $n = 214$ ; 66.9%), married ( $n = 262$ ; 81.9%), graduated from senior high school ( $n = 171$ ; 53.4%), did not work both full time or part time ( $n = 192$ ; 60.0%), and had 1-2 comorbidities ( $n = 141$ ; 44.3%) These were measured using Charlson's Comorbidity Index (CCI). [Table 2](#) also presented the age and duration of hemodialysis. The participants in this study were between 18 to 93 years old, the average for age was 51.50 (SD = 14.56), and the mean for hemodialysis duration was 46.28 (SD = 43.76) or equal to 3.8 years.

### The Description of Multidimensional Symptom Burden

Thirty-two symptom burdens (physical and psychological) in four dimensions (occurrence, severity, distress and frequency) were collected. A summary of symptom burden experienced by the population is presented in [Table 2](#). For the total score result, the minimum score is 0.30 and the maximum score is 63.81. The mean and SD of the total score are  $23.69 \pm 12.27$ .

#### a. Occurrence Dimension

For occurrence dimension, there are 5 most prevalent symptoms burden such as lack of energy ( $n = 269$ ; 84.0%), dry skin ( $n = 250$ ; 78.1%), muscle soreness ( $n = 232$ ; 72.5%), light headedness or dizziness ( $n = 222$ ; 69.3%), and bone or joint pain ( $n = 220$ ; 68.7%). Furthermore, more than 50% of the population also experienced decreased interest in sex ( $n = 210$ ; 65.6%), difficulty in being sexually aroused ( $n = 211$ ; 65.4%), trouble in falling asleep ( $n = 202$ ; 63.1%), trouble in staying asleep ( $n = 197$ ; 61.5%), muscle cramps ( $n = 200$ ; 62.5%), itching ( $n = 190$ , 59.3%), headache ( $n = 189$ , 59.0%), dry mouth ( $n = 189$ , 59.0), cough ( $n = 179$ , 55.9), shortness of

breath ( $n = 176$ , 55.0%), and numbness or tingling ( $n = 165$ , 51.5%).

#### b. Severity Dimension

The severity of 32 the symptom burden reported by all participants had mean and SD of  $69.94 \pm 79.59$ . The five most severe symptom burdens were lack of energy ( $4.28 \pm 3.08$ ), followed by difficulty of being sexually aroused ( $3.41 \pm 3.36$ ), decreased interest in sex ( $3.39 \pm 3.38$ ), trouble falling asleep ( $3.13 \pm 3.24$ ) and bone or joint pain ( $3.12 \pm 2.77$ ).

#### c. Distress Dimension

Furthermore, for the distress dimension, the majority of participants reported moderate to high symptom distress. The mean and SD for overall symptom distress were  $72.11 \pm 81.71$ . Five symptoms were found to be the most bothersome for all participants including energy deprivation ( $4.42 \pm 3.09$ ), bone or joint pain ( $3.26 \pm 2.85$ ), muscle soreness ( $3.10 \pm 2.64$ ), trouble in falling asleep ( $3.17 \pm 3.25$ ), and decreased interest in sex ( $2.92 \pm 2.99$ ).

#### d. Frequency Dimension

The fourth dimension is the frequency dimension. The mean for all participants in the frequency dimension was  $71.93 \pm 83.68$ . The five most frequent symptoms among all participants involved lack of energy ( $4.41 \pm 3.27$ ), dry skin ( $4.09 \pm 3.39$ ), decreased interest in sex ( $3.70 \pm 3.65$ ), difficulty of being sexually aroused ( $3.67 \pm 3.65$ ), and trouble falling asleep ( $3.33 \pm 3.49$ ).

## Discussion

### Characteristics of Sample

In the current study, the average age of the patients was 51.50 years old. This data was related to the previous study from Indonesia conducted by [Kamil \(2017\)](#) which mentioned that an average age of hemodialysis population in Indonesia was 53 years old. Three other studies mentioned an average age of patients with hemodialysis are between 50-60 years old ([Almutary et al., 2013](#); [Amro et al., 2016](#); [Shim & Cho, 2018](#); [Yu, Huang, & Tsai, 2012](#)).

The current study also reported that the majority of the sample was male ( $n = 175$ ; 55%). According to the Indonesian Renal Registry (IRR) in 2018, it was reported that 57% of new hemodialysis patients in Indonesia are male (IRR, 2018). Three other studies from different country including Saudi Arabia, Norway and Taiwan confirmed this report ([Almutary et al., 2016](#); [Amro et al., 2016](#); [Shim & Cho, 2018](#); [Yu, Huang, & Tsai, 2012](#)).

A total of 81.9% of hemodialysis patients in the current study were married. This data was related to three previous studies ([Almutary et al., 2016](#); [Shim & Cho, 2018](#); [Yu, Huang, & Tsai, 2012](#)). The original study from Saudi Arabia reported that 59.6%

of patients were married (Almutary et al., 2016). Furthermore, Shim and Cho (2018) from Korea reported that 56.3% of subjects were married.

The hemodialysis duration is approximately between 1-5 years. This data was also related with the previous study from Shim and Cho (2018) which reported that 70% of populations had undergone hemodialysis for less than 5 years. Only 30% of populations underwent hemodialysis duration > 5 years.

The current study reported that the majority of patients suffered 1-2 comorbid diseases including hypertension and diabetes. Hypertension occurred in 51% of populations, while diabetes occurred in 21% of populations. This result is similar to the IRR (2018) which reported the highest comorbidities among hemodialysis patients in Indonesia are hypertension and diabetes. Similar to the current study, the original study reported that 51.4% patients lived with 1-2 comorbidities (Almutary et al., 2016).

For the level of education, most hemodialysis patients in Indonesia have high school education. The original study had a lower level of educational, because 53.9% of them had had less than high school education status (Almutary et al., 2016). In South Korea, the education level of hemodialysis patients is higher. The majority of patients had been in school for more than 16 years.

The last characteristic data is the employment status, most of patients in the current study were unemployed due to their illness. Two studies reported similar issues (Lee & Jeon, 2015; Shim & Cho, 2018) where 63.4% of population in the study conducted by Shim and Cho (2018) were unemployed due to their illness. The original study reported that above 50% of their participants were employed.

### The Description of Multidimensional Symptom Burden

The description of symptom burden among patients with hemodialysis in Indonesia is presented in four dimensions (occurrence, severity, distress, frequency) with a total of 32 symptoms assessed including physical and psychological symptoms. Present study captured symptom burden using comprehensive measurement tools. A comprehensive assessment of symptoms is important to gain better knowledge of the symptom burden.

The score of symptoms in each dimension has contributed to the total symptoms burden. The total symptom burden was 63.81, indicating that more than 15 symptoms (from 32 symptoms) were frequent, severe and distressing to patients with hemodialysis. In the original study, the total symptom burden was higher than current study, which was 83.36 (Almutary et al., 2016). This may be due to the diversity of the population in previous studies which

consist of patients with CKD stage 4, CKD stage 5 (non-dialysis), peritoneal dialysis, and hemodialysis. Meanwhile in this study, all participants received hemodialysis as a treatment.

The current study listed the 5 highest symptom burdens in each dimension. Occurrence dimension was dominated by physical symptoms such as lack of energy, dry skin, muscle soreness, dizziness, and bone or joint pain. Severity dimension was dominated by lack of energy, difficulty in becoming sexually aroused, decreased interest in sex, trouble in falling asleep, and bone or joint pain. Distressing symptoms were lack of energy, bone or joint pain, muscle soreness, trouble in falling asleep, and decreased interest in sex. The last was frequency dimension consisting of lack of energy, dry skin, decreased interest in sex, difficulty in becoming sexually aroused, and trouble in falling asleep.

Interestingly, lack of energy was consistently found as the highest symptom burden in all dimensions. This finding was related to the previous research which stated that fatigue or lack of energy was dominant and consistent among patients with hemodialysis along all dimensions (Almutary et al., 2016). The majority of patients on hemodialysis commonly experienced fatigue or lack of energy (Kustimah, Siswadi, Djunaidi, & Iskandarsyah, 2020). Among patients on hemodialysis, fatigue may be caused by many factors such as inadequate hemodialysis treatment, demographic characteristics (older age and female), psychosocial problem (depression, anxiety, low social support), physiological factors (anemia, lower albumin serum, lower creatinine interdialytic weight gain), and low sleep quality (Horigan, 2012).

### Conclusion

The authors found that the majority of hemodialysis patients in Indonesia were male, adult, with an average duration of hemodialysis 3.8 years, married, had normal weight, graduated from high school, did not work, and lived with 1-2 comorbidities. Patients with hemodialysis experience a burden of symptoms that have an impact on daily life. In this study, energy deprivation was the highest symptom burden among patients on hemodialysis.

### Recommendation

Health care professionals need to identify symptom burden among hemodialysis patients comprehensively, which consist of two domains (physical and psychological) and four dimensions (prevalence, severity, frequency, and distress). Creating appropriate interventions for energy deficiency is also important to improve health-related quality of life among hemodialysis populations.

### Disclosures and Acknowledgement

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### Conflict of interest

The authors declared that there was no conflict of interest.

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