SOUTH EAST ASIA NURSING RESEARCH

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Original Research

Does Senior High School Strand Matter in Nursing Students' Academic Self-Regulated Learning and Academic Performance?

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The Philippines recently adopted the K to 12 program in basic education. Under this program, students can choose their track and strand relative to their interests or career choices when they reach senior high school. However, issues surfaced when the K to 12 graduates were admitted to the college courses not aligned with the strand they have completed. This cross-sectional study was conducted to determine the difference in the academic self-regulated learning and performance of the STEM (Science and Technology, Engineering, and Mathematics) and non-STEM graduates in senior high school among freshmen nursing students in a city-subsidized college in the Philippines. The Academic Self-Regulation Learning Scale and grades of students in the first semester were used and analyzed in this study. Results showed that there was a significant difference in the academic self-regulated learning (p=0.045) and academic performance (p=0.000) of freshmen nursing students when grouped according to their senior high school strand. The STEM graduates had significantly higher academic self-regulated learning and academic performance than the non-STEM completers. Unfortunately, no significant relationship was established between academic self-regulated learning and academic performance (p=0.559). Students who are graduates of the STEM strand from senior high school appear to be better prepared to take up the nursing course. Colleges of nursing may consider the academic strand of students in senior high school when admitting students in the nursing program.

INTRODUCTION

Education expands our vision and outlook of the world. Hence, it is no wonder that many countries including the Philippines are in the molding process of making education the primary asset the country could have. Not so long ago, the Philippine Basic Education implemented K-12 Curriculum that has been legalized by the Republic Act 10533.[1] The Republic Act No. 10533 (2013) otherwise known as the Enhanced Basic Education Act of 2013 adds two years of senior high school education. High school now has two divisions: the junior and senior high school, and students in the country must pass through the two divisions to earn a high school diploma and qualify to enter college or university. Under this program, students are to choose their own track or strand according to their preference, or field of interest, or decide to

venture out employment for the next two years of senior high school education. The senior high school students undertake a standard core curriculum and can choose from four tracks of specialization: Academic, Technical-Vocational and Livelihood (TVL), Sports, and Arts and Design.[3] These tracks are specific areas of study similar to college courses.[4] The academic track is further divided into four strands: Science, Technology, Engineering, and Mathematics (STEM); Accountancy, Business, and Management (ABM); Humanities and Social Sciences (HUMSS); and General Academic.[3]

Having an ideal strand offer learners a sense of self-assurance and can help students to be passionate about their chosen career.[5] Alignment to the chosen college course was the main reason of students enrolling in the STEM strand.[6] Besides, a study found that STEM status significantly predicted retention and graduation outcomes.[7] Poor adjustment and academic performance to the health science courses also contribute to dropout rates of students.[8] However, the Commission on Higher Education (2017) in the Philippines released a memorandum order indicating that all Grade 12 senior high school graduates are eligible to enter college irrespective of the strand or track they have taken in senior high school.[9] The problem arises when the K to12 graduates are to pursue a college degree that is not related to the strand they finished during their senior high school years. Difficulties arise in a sense that that the subjects taken in senior high school are not aligned to the desired academic program, or the skills and knowledge learned by the students in senior high school might not be enough to compensate to the demands of the chosen college degree.[10]

Thus, this study was conducted to determine if there were significant differences in academic performance of K to 12 graduates specifically from the STEM and non-STEM strand as they unveil their college journey into nursing as their chosen college academic program. It is imperative for nursing educators to understand and regularly assess the academic performance of students.[11] Research on students' academic performance or academic achievement is important because it is one of the indicators of students' success in learning.[12-14] Moreover, academic and career guidance are among the expressed guidance needs of nursing students.[15] Helping students understand their likely success in their chosen college degree is thereby necessary.

Meanwhile, knowing the concept of self-regulated learning is necessary in today's social and academic world.[16] Self-regulated learning has been applauded as the key competence to lifelong learning.[17] Despite being a well-studied topic in the fields of psychology and education, limited research focused on its relationship to the academic performance of nursing students. Understanding self-regulation is essential in the development of students' capabilities and achievement.[16] In this study, we also investigated the relationship between self-regulated learning and academic performance among nursing students.

METHODS

The research design utilized in the study was cross-sectional research. This study was conducted among 112 freshmen or first-year nursing students in a city-subsidized college in the Western Visayas region of the Philippines.

The instrument used was the Academic Self-Regulated Learning Scale (A-SRL-S) developed by Magno (2010) to measure self-regulation within the context of students' learning in higher education. Each item is scaled using a four-point Likert scale (1-Strongly disagree to 4-Strongly agree). The A-SRL-S contains 54 items with seven (7) subscales. The scale has been reported to have high validity and reliability measures when tested among Filipino college students. The internal consistency of

the seven subscales was between 0.70 and 0.84 [18]. For this study, the A-SRL-S has an overall reliability of Cronbach's alpha 0.95. The survey questionnaires were distributed personally to the students of the said department after their lecture classes. Directions were given as to how to answer and fill up the survey instrument. The whole content of the survey instrument was discussed before the participants can answer the questionnaires to avoid confusion. After signing the informed consent forms, the respondents were given ample time (30 minutes) to fill up the said questionnaires. Afterwards, the researchers personally retrieved the said questionnaires then checked for completeness of responses.

The academic performance of students was measured using their actual grades in the first semester of the academic year 2018-2019 taken from the Office of the Registrar with permission from the college dean and after participants consented to partake in the study. A demographic profile sheet was also used to collect pertinent demographic data and identify the academic strand of students. In this study, the students were categorized as either STEM or non-STEM strand (includes ABM, HUMSS, and general academic strands of the academic track and other tracks).

Data analysis was carried out using SPSS version 23. Mean, standard deviation, frequency, and percentage were used for descriptive analysis. Mann-Whitney U test was employed to determine significant differences while Spearman's rho was utilized to measure the relationship between academic self-regulation and performance. Alpha level of significance was set at 0.05.

RESULTS

Table 1 present the profile of the participants. The average age of freshman nursing students was 18.86 (SD=0.73) years. The majority (83.9%) of the students were females. Most (81.2%) students belonged to families with an average monthly salary of 15,780 pesos/month or less. A little over half (51.8%) had 4 or more siblings. A little over two-thirds (68.7%) were graduates of the non-STEM strand in senior high school.

Table 2 shows that the composite mean score of nursing students in the A-SRL-S was 3.31 (SD=0.53). The mean score of the graduates of the STEM strand and non-STEM strand were 3.35(SD=0.34), and 3.29 (SD=0.53), respectively. Moreover, the mean average grade reflecting the academic performance of first-year nursing students in the first semester was 91.35 (SD=0.67). The mean average grade of the graduates of the STEM strand and non-STEM strand were 92.39(SD=1.32), and 90.87 (SD=1.60), respectively.

Table 3 shows that there was a significant difference in academic self-regulated learning and academic performance of freshmen nursing students based on their senior high school strand. Graduates of the STEM strand were significantly more (p=0.045) self–regulated learners compared to the graduates of the non-STEM strand. At the same time, graduates of the STEM strand had a significantly higher (p=0.000) academic performance than the graduates of the non-STEM strand.

Table 4 shows that there was no significant relationship (p=0.559) between academic self-regulated learning and academic performance of freshman nursing students.

Table 1
Profile and strand in High School

	M	SD	f	%
Age (years)	18.86	0.73		
Sex				
Male			18	16.1
Female			94	83.9
Monthly family income				
Less than 7,890/Month			52	46.4
Between 7,890 to 15,780/Month			39	34.8
Between 15,781 to 31,560/Month			17	15.2
Above 31,561/month			4	3.6
Number of siblings				
3 or less			45	40.2
4 or more			58	51.8
No siblings			9	8.0
Senior high school (SHS) strand				
STEM			35	31.3
Non-STEM			77	68.7

Table 2
Academic self-regulation and academic performance

Variables	General		STEM		Non-STEM	
	M	SD	M	SD	M	SD
Academic self-regulated learning	3.31	0.53	3.35	0.34	3.29	0.53
Academic performance	91.35	0.67	92.39	1.32	90.87	1.60

Table 3
Differences in academic self-regulated learning and performance

Variables	Academic self-regulated learning			Academic performance		
SHS strand	Mean Rank	U	p-value	Mean Rank	U	p-value
STEM	65.63	1028.0	0.045	77.41	615.5	0.000
Non-STEM	53.45			46.99		

Table 4
Academic self-regulation and academic performance

Variables	Correlation coefficient	p-value
Academic self-regulation and performance	-0.050	0.599

DISCUSSION

This study investigated the difference in academic self-regulated learning and academic performance among nursing students between graduates of STEM and non-STEM strand. This study came about after observing students who were non-STEM completers were struggling in their science and nursing courses. It has also been observed that their grades were lower in these courses. On the other hand, STEM completers have shown remarkable grades in their science and nursing courses.

In this study, we found that the academic self-regulated learning and performance of nursing students varied according to their senior high school academic strand. Ideally, STEM completers are supposed to enroll in nursing. Their track and strand are geared towards learning the foundations of academic subjects aligned with the nursing program. Our results also indicate that

graduates of the STEM strand had a higher academic self-regulation suggesting that these students are better in terms of planning and organizing, goal-setting, self-evaluation, memory strategy, learning responsibility, seeking assistance, and environmental structuring. Similar findings were reported in prior studies. Graduates of the STEM academic strand had a significantly higher academic performance compared to the non-STEM strand graduates. A significant difference in the academic adjustment and performance of freshmen students from different health science disciplines in the Philippines was similarly noted in another study.[19] A study among engineering students likewise found a significant difference in the Calculus 1 performance between students from the STEM and non-STEM strands.[4] Students from the STEM strand also performed better academically in the Applied Chemistry course.[20] Our findings seem to indicate that the STEM graduates are likely to succeed in the nursing program with minor difficulties and adjustments as compared to their non-STEM counterparts. In addition, our results seem to point out that the K to 12 program of the Philippines plays a significant role in preparing senior high school students for their chosen career path if followed appropriately.

Moreover, our study demonstrated no correlation between academic self-regulation and academic performance among freshmen nursing students. No significant correlation between self-regulation and educational performance among public university students was also reported by Sahranavard, Miri, & Salehiniya (2018).[21] No relationship between academic self-regulation and their academic performance was also disclosed in a study among senior high school students in the Philippines.[22] High self-regulation did not predict school ability in another study.[23] It has also been noted that not all self-regulated learning strategies exerted the same influences on academic achievement and a decreasing trend on the effect size

between self-regulated learning and academic achievement was observed.[17] However, our result is contrary to other studies conducted in other disciplines. A weak positive association between self-regulated learning and academic achievement was found among undergraduate medical students.[13] A study among preparatory school students at Cag University in Mersin, Turkey revealed that the more students use self-regulation strategies, the more likely they become academically successful.[24] Self-regulation of learning and achievement were significantly correlated among the undergraduate program in the Faculty of Psychology at Padjadjaran University.[25] Four of five domains of self-regulated learning had a positive impact on academic performance of students in another study.[26] The variation in findings may be attributed to the different measures used to assess self-regulated learning between studies and also to the relatively limited sample of our study. Nonetheless, further research is required to confirm our findings. It is argued that self-regulated learning is a complex phenomenon hence, future scholars need to pay more attention to the different dimensions of self-regulated learning in relation to academic achievement.[16]

This research has limitations. This study only included first-year nursing students in one nursing school in the Philippines who were enrolled in the academic year 2018-2019. Findings cannot be generalized in all schools and students locally and in other countries. Also, this study is limited to the academic performance of students in one semester only. Future researchers may compare the difference between strands upon completion of the degree. Furthermore, our research relied only on self-administered questionnaires for data collection and the cross-sectional research design of our research cannot establish a causal effect of the independent variable to the outcome variable. Nonetheless, this

research has contributed to the limited but growing research on the topic.

CONCLUSION

The strand or track of students in senior high school influences their academic self-regulated learning and academic performance. Students' stranding in senior high school has prepared them for a better transition in college especially in the nursing program. Students who are graduates of the academic STEM strand from senior high school appear to be more prepared to take up the nursing course, better able to cope with the demands of the course, and are likely to excel in the nursing school. Our study recommends that high school students should be given proper career guidance relative to the course they intend to take in college. Likewise, colleges of nursing may consider the academic strand of students in senior high school when admitting students in the nursing program. Moreover, our study suggests that added attention and guidance must be provided to non-STEM students admitted in the undergraduate nursing program.

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CONFLICTS OF INTEREST

Neither of the authors has any conflicts of interest that would bias the findings presented here.

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Original Research

High Ultrafiltration Increasing Intradialytic Blood Pressure on Hemodialysis Patients

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Article Info

Abstract

The increase in blood pressure when the patient is undergoing hemodialysis is experienced by patients with intradialytic hypertension. This condition can be very dangerous for the patient, must be prevented and needs to be controlled. Prevention can be done by controlling variables that can affect intradialytic blood pressure, including ultrafiltration during hemodialysis. This study aims to analyze the relationship between ultrafiltration (ultrafiltration goal, ultrafiltration rate) and intradialytic blood pressure. This research was a descriptive-analytic study with a cross-sectional design, with 112 samples at two centres of dialysis in Semarang. Data were analyzed using the Spearman Rho. The finding obtained showed that ultrafiltration goal (UFG) and ultrafiltration rate (UFR) correlated with intradialytic blood pressure (systolic, diastolic and mean arterial pressure). The magnitude of UFG an associated with increase in intradialytic systolic (p=0,024; r=0,213), increase in intradialytic diastolic (p=0,007; r=0,252) and increase in mean arterial pressure (p=0,016; r=0,227). High UFR is associated with with increase in intradialytic systolic (p=0,037; r=0,211), increase in intradialytic diastolic (p=0,001; r=0,320) and increase in mean arterial pressure (p=0,034; r=0,200). Determination of ultrafiltration during hemodialysis must be done carefully and precisely to prevent an increase in intradialytic blood pressure.

INTRODUCTION

Chronic Kidney Disease (CKD) is an irreversible decline in renal function so that the kidneys are unable to regulate body homeostasis.[1] CKD patients at the End Stage Kidney Disease stage require renal replacement therapy to maintain body functions.[2] Hemodialysis is a kidney replacement therapy that is widely used by patients with end-stage kidney disease.

Hemodialysis is effective in removing fluids, electrolytes and metabolic waste and improves the quality of life for CKD patients. The main goal of hemodialysis in patients with End-Stage Kidney Disease is symptom relief, controlling uremia, fluid overload,

and electrolyte imbalance.[3] However, various intradialytic complications can occur in patients undergoing hemodialysis. The complications experienced by many hemodialysis patients are an increase in intradialytic blood pressure or the occurrence of intradialytic hypertension. Intradialytic hypertension is a persistent increase in blood pressure during hemodialysis and at the end of hemodialysis is higher than blood pressure at the initiation of hemodialysis. It's marked by an increase in Mean Arterial Blood Pressure (MAP) > 15 mmHg on dialysis sessions.

Several studies in Indonesia show that the incidence of intradialytic hypertension is a common complication experienced by many patients. A retrospective cohort study of 22,955 hemodialysis treatments showed that the prevalence of intradialytic hypertension was 21.3 per 100 procedures.[4] Research in Denpasar found that the incidence of IDH was 32.1%.[5] Research on hemodialysis patients in Yogyakarta also concluded that the frequency of intradialytic hypertension was 54%.[6] Another study on 198 hemodialysis patients in Palembang also showed that 58.6% of the patients had intradialytic hypertension. The increase in blood pressure can be severe even to the point of a hypertensive crisis that endangers the patient.[7]

High intradialytic blood pressure will affect hemodialysis adequacy, increasing the risk of heart failure and patient death. Previous studies in 151 routine hemodialysis patients showed that high interdialytic blood pressure was associated with an increased risk of stroke and death. A total of 13.91% of patients with high interdialytic blood pressure had a stroke and 16.56% of patients died.[8] An increase in intradialytic blood pressure must be anticipated with proper control of the risk factors.

Various factors cause an increase in intradialytic blood pressure including excess fluid (fluid overload). An increase in

blood pressure during hemodialysis can occur due to activation of the renin-angiotensin-aldosterone system (RAAS) due to hypovolemia when the fluid withdrawal is carried out through Ultrafiltration.[7] The process of withdrawal of fluid during hemodialysis through Ultrafiltration involves the fluid withdrawal rate or ultrafiltration rate (UFR) and the amount of fluid withdrawn or ultrafiltration goal (UFG). The amount and speed of fluid withdrawal during hemodialysis can be seen from the ultrafiltration which is regulated in the form of UFG and UFR determination.

Determination of the UFG and UFR should be optimal to achieve normotensive conditions in hemodialysis patients. When hemodialysis is performed, the UFG determination is determined to draw excess fluid in the blood, the UFG size depends on the addition of the interdialytic body weight gain (IDWG) and the target patient's dry weight.[9] The phenomenon in the field is often the determination of ultrafiltration based on the increase of IDWG which indicates the amount of fluid buildup in the body. Excess fluid occurs due to poor fluid intake regulation during the interdialytic period, which is characterized by a high IDWG value.[10] If fluid intake is excessive, during the period between dialysis there will be a large weight gain.[11]

Hypervolemia (fluid overload) is believed to play a role in the pathogenesis of intradialytic hypertension.[12] Often the ultrafiltration determination during hemodialysis exceeds the requirements. A decrease in relative blood volume and total blood volume due to a large ultrafiltration goal decreases blood flow to the kidneys, stimulates the release of renin and causes hypertension.[13]

This study aims to analyze the relationship between ultrafiltration during hemodialysis (ultrafiltration goal, ultrafiltration rate) and intradialytic blood pressure. This research is useful to anticipate and prevent

intradialytic hypertension by controlling these factors.

METHODS

The study design was a cross-sectional study. The aim of the studies to determine the relationship between ultrafiltration goal (UFG), ultrafiltration rate (UFR) and intradialytic blood pressure. The population were 188 patients who underwent hemodialysis in January 2019 in two hemodialysis units in Semarang Central Java, Indonesia. Sampling using purposive sampling according to the inclusion criteria. The inclusion criteria of this study were: patients undergoing regular hemodialysis for more than three months, scheduled hemodialysis with a frequency of 2 times a week with a duration of hemodialysis 4 hours, awareness of compos mentis, can communicate well verbally, aged 18-60 years and not using erythropoietin. The sample of this study were 112 patients.

The instrument used in this study as a tool for measuring blood pressure (BP) before, during and after the patient underwent hemodialysis using a digital sphygmomanometer. Measurement blood pressure using a standard digital sphygmomanometer that has been calibrated. Blood pressure measurements were taken before hemodialysis, at 2.5 hours hemodialysis (intradialytic) and after hemodialysis. Measurements were made on the arm that was not attached to the vascular access. The predialysis blood pressure was measured 5 minutes before the dialysis needle was inserted and the post-analysis blood pressure was measured 5 minutes after the dialysis needle was removed. UFG is the amount of fluid drawn by the hemodialysis machine during a hemodialysis session in litres, which can be seen from the hemodialysis machine monitor screen. Excess UFG is the amount of fluid drawn by the hemodialysis machine during one HD session in excess of 4.8% dry body weight. UFR is the amount of fluid drawn by the hemodialysis machine per kilogram of body weight per hour (ml/kg/hour).

This research applies the principles of research ethics include the principles of confidentiality, benefits, the principles of respecting human dignity and the principles of justice. This study was conducted after obtaining approval from the ethics committee. The principles of research ethics in this research.

Univariate analysis was used to describe the characteristic data of respondents in the form of age, gender, frequency of hemodialysis, length of undergoing hemodialysis, and ultrafiltration (UFG and UFR). Research data were analyzed univariately and using a personal computer program. Univariate analysis by presenting numeric and categorical data. Numerical data such as age, frequency of hemodialysis, length of undergoing hemodialysis, ultrafiltration (UFG and UFR) and blood pressure are described in the central tendency (mean, minimum, maximum and standard deviation). Data categorized by gender distributed in a frequency distribution. The data normality test was carried out before carrying out the bivariate test. The results of the normality test with Saphiro Will showed that ultrafiltration data and intradialytic blood pressure were not normally distributed (p <0.005). Bivariate analysis was performed using statistical data processing software on the computer, used Spearman's rho test. Bivariate statistical test to determine the relationship and direction of the relationship between the ultrafiltration variable and intradialytic blood pressure.

RESULTS

Table 1 showed the mean patient age was 47,77 years with the youngest age being 20 years and the oldest being 70 years. The number of male and female respondents is equal, each 50%. The mean length of hemodialysis was 26,20 months. The mean frequency of hemodialysis was 184,95 times. The mean of ultrafiltration goal (UFG) was

2704,91 times and the mean of ultrafiltration goal (UFR) was 11,366 mL/h/kg.

The results in table 2 show that the mean pre-dialysis systolic blood pressure was 158.214 mmHg, the lowest was 107 mmHg and the highest was 195 mmHg. The mean pre-dialysis diastolic blood pressure was 86.652 mmHg, the lowest was 76 mmHg and the highest was 114 mmHg. The mean intra-dialysis systolic blood pressure was 168.839 mmHg, the lowest was 110 mmHg and the highest was 198 mmHg. The average intra-dialysis diastolic blood pressure was 95.161 mmHg, the lowest was 86 mmHg and the highest was 115 mmHg. The average post-dialysis systolic blood pressure was 169.920 mmHg, the lowest was 100 mmHg and the highest was 211 mmHg. The mean post-dialysis diastolic

blood pressure was 94.384 mmHg, the lowest was 74 mmHg and the highest was 121 mmHg.

The figure 1 shows an increase in intradialytic and post-dialysis blood pressure. This research showed that the mean systolic, diastolic and mean arterial pressures of intradialytic and post-dialysis were higher than before (pre) hemodialysis.

The results of statistical analysis with *Spearman Rho* test showed that there was a relationship between ultrafiltration (UFG and UFR) with intradialytic systolic blood pressure, intradialytic diastolic blood pressure (p=and mean intradialytic arterial pressure (p-value < 0,005). The greater the UFG and UFR the higher the intradialytic blood pressure (r 0,211-0,320).

Table 1
Characteristic of respondents (n=112)

Indicators	f	%	Mean ± SD (min-max)
Age			47,77 ± 11,66 (20-70)
Gender			
Male	56	50	
Female	56	50	
Frequency of hemodialysis			184,95 ± 153,79 (24-807)
Length of hemodialysis (months)			26,20 ± 39,012 (3-374)
Ultrafiltration Goal (ml)			2704,91 ± 1000,359 (500-4000)
Ultrafiltration Rate (mL/h/kg)			11,366 ± 4,020 (2-18)

Table 2
Description of Pre, Intra dan Post Hemodialysis Blood Pressure (n=112)

| Indicators (Blood Pressure)	Mean ± SD (min-max)
Pre dialytic blood pressure	
Systolic (mmHg)	158,214 ± 17,151 (107-195)
Diastolic (mmHg)	86,652 ± 18,186 (76-114)
Mean Arterial Pressure (mmHg)	134,432 ± 12,736 (92,7-164,3)
Intra dialytic blood pressure	
Systolic (mmHg)	168,839 ± 18,009 (110-198)
Diastolic (mmHg)	95,161 ± 9,28 (86-115)
Mean Arterial Pressure (mmHg)	156,779 ± 134,049 (96,7-155)
Post dialytic blood pressure	
Systolic (mmHg)	169,920 ± 21,461 (100-211)
Diastolic (mmHg)	94,384 ± 13,052 (74-121)
Mean Arterial Pressure (mmHg)	144,763 ± 17,362 (90-174)
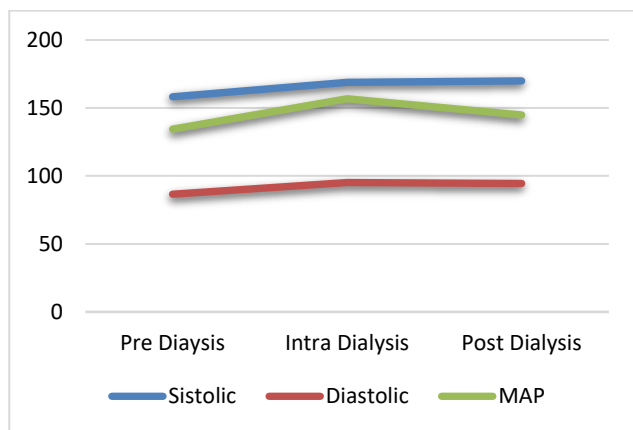
Figure 1
Pre, Intra and Post Hemodialysis Blood Pressure
(n=112)

Table 3
Statistical analysis of the relationship between
ultrafiltration and intradialytic blood pressure in
hemodialysis patients (n=112)

Indicators	p	r
UFG – Intradialytic Systolic Blood Pressure	0,024*	0,213
UFG – Intradialytic Diastolic Blood Pressure	0,007*	0,252
UFG – Intradialytic Mean Arterial Pressure Pressure	0,016*	0,227
UFR – Intradialytic Systolic Blood Pressure	0,037*	0,211
UFR – Intradialytic Diastolic Blood Pressure	0,001*	0,320
UFR – Intradialytic Mean Arterial Pressure (MAP)	0,034*	0,200

*Spearman Rho

DISCUSSION

Blood pressure is one hemodynamic indicator that needs to be considered in patients undergoing hemodialysis. An increase in blood pressure or a decrease in blood pressure during the hemodialysis process can endanger the patient's condition. Research on hemodialysis patients in Indonesia shows that the increase in blood pressure during hemodialysis is more experienced by patients undergoing hemodialysis. This research showed that the mean systolic, diastolic and mean arterial pressures of intradialytic and post-dialysis were higher than before (pre) hemodialysis.

The increase in blood pressure during hemodialysis is also referred to as

intradialytic hypertension have an increased mortality risk compared to patients with modest decreases in blood pressure during dialysis. Intradialytic hypertension is associated with extracellular volume overload in addition to acute increases in vascular resistance during dialysis. Management strategies should include reevaluation of fluid overload and high ultrafiltration during hemodialysis.[14] Hemodialysis patients have to control fluid overload by controlling interdialytic weight gain (IDWG).

Control of IDWG is needed to prevent an increase in the incidence of increasing blood pressure during hemodialysis. A study in China showed that reducing fluid overload in intradialytic hypertension patients with high predialytic blood pressure can effectively improve their blood pressure, but did not affect blood pressure in normal predialytic blood pressure intradialytic hypertension cases.[15]

An important factor causing an increase in intradialytic blood pressure, among others, is excess fluid. Hypervolemia condition will have implications for the many intradialytic fluid withdrawals determined by ultrafiltration. Increased blood pressure during hemodialysis can occur due to activation of the renin-angiotensin-aldosterone system due to hypovolemia when fluid withdrawal occurs intradialytic through ultrafiltration.

The findings of this study showed that increased ultrafiltration during hemodialysis increases the risk of intradialytic hypertension. This research showed there was a relationship between ultrafiltration (UFG and UFR) with intradialytic systolic blood pressure, intradialytic diastolic blood pressure and intradialytic mean arterial pressure. The greater the UFG and UFR the higher the intradialytic blood pressure.

The results of this study corroborate the findings of previous studies. The findings of

this study reinforce the results of research on hemodialysis patients in Surakarta, that the amount of ultrafiltration during hemodialysis has a positive correlation with the incidence of increased intradialytic blood pressure with p = 0.003 and r = 0.421.[16] Previous studies have examined ultrafiltration rates for mortality and cardiovascular disease (CVD). Ultrafiltration speed is divided into 3 categories: <10 ml/hour/kg, 10-13 ml/hour/kg, and> 13 ml/hour/kg. Faster ultrafiltration in hemodialysis patients is associated with a greater risk of multiple causes of CVD morbidity and mortality.[17] A study of 64 hemodialysis patients showed that there was a linear correlation between high UFR and all cardiovascular disease morbidity and mortality where UFR was ≥ 10 ml/hour/kg body weight has the highest risk.[18]

Excessive ultrafiltration during hemodialysis due to high IDWG will lead to activation of the sympathetic nervous system, activation of RAAS, increased cardiac output. The process with intradialytic ultrafiltration risks reducing the Relative Blood Volume (RBV) and Total Blood Volume (TBV). The decrease in RBV and TBV will decrease blood flow to the kidneys and stimulate renin release. Renin stimulates angiotensin I to angiotensin II causing vasoconstriction and aldosterone secretion.[2] Then vasoconstriction and aldosterone secretion will trigger an increase in intradialytic blood pressure.

Determination of the amount of ultrafiltration must be optimal to achieve normotensive conditions in hemodialysis patients. When hemodialysis UFG determination is determined to attract excess, the magnitude of the UFG may depend on the addition of the IDWG and the target dry weight of the patient[9]. High UFG can lead to intradialytic vascular resistance. Intradialytic vascular resistance surges remain implicated as the driving force for blood pressure increases.[19]

Previous studies on patients who had hypertension during hemodialysis showed dilatation of the heart. The patient had an increase in blood pressure on ultrafiltration. A study by Cirit et al concluded that paradoxical blood pressure increases with ultrafiltration usually due to overhydration and heart dilation.[20] Another study also by Chou et al proved that aggressive ultrafiltration can decrease the heart index and mean arterial pressure (MAP), these results support volume overload as the cause of the initial increase in MAP during ultrafiltration.[21] This study also showed there was a correlation between ultrafiltration (UFG and UFR) with Intradialytic Mean Arterial Pressure (p= 0,016 & p=0,034). The greater the UFG and UFR the higher the Intradialytic Mean Arterial Pressure (r=0,227 & r=0,200).

Previous research on seven patient undergoing hemodialysis showed that after the fluid was withdrawn a total of 2520 ± 1698 cc then 4.5 ± 2.3% of the body fluid was withdrawn, the systolic heart function parameters were significantly increased to the maximum, arterial pressure increased from 107 ± 5 to 118 ± 6 mmHg with p <0.027. This increase in blood pressure was accompanied by an increase in the cardiac index (from 3.8 ± 0.6 to 4.8 ± 1.1 L / min / m2, p <0.027). This study also concluded that the increased blood pressure during ultrafiltration is due to an increase in cardiac output, mediated by volume overload.[22] Fluid excess (overload) can also be associated with adherence to fluid intake. The findings of this study indicate that poor fluid adherence correlated with the incident of increasing intradialytic blood pressure. Hemodialysis patients should comply with the restriction of fluid intake. If the patient is not adherent, there is a higher risk of fluid overload and a higher risk of intradialytic hypertension.

Care must be taken to determine the amount of ultrafiltration during hemodialysis to keep blood pressure stable and the patient's condition safe.

Determination of ultrafiltration that is not excessive and within the normal range will reduce the risk of an increase in intradialytic blood pressure. Determination of ultrafiltration during hemodialysis must be done carefully and precisely to prevent an increase in intradialytic blood pressure.

CONCLUSION

There is a relationship between ultrafiltrate and intradialytic blood pressure. The greater the ultrafiltration, the more the intradialytic blood pressure increases.

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CONFLICTS OF INTEREST

Neither of the authors has any conflicts of interest that would bias the findings presented here.

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Original Research

Community Knowledge and Compliance inDoing Prevention of COVID-19

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Article Info	Abstract
	Background: Community compliance in taking measures to prevent transmission of COVID-19 must be based on good knowledge about COVID-19 so that it can break the chain of transmission of COVID-19. Objective: To determine the relationship between the level of community knowledge about COVID-19 with compliance to prevent COVID-19 at the Public Health Center of Jati Kudus. Method: This study used a quantitative analysis with a cross-sectional approach. The population was 115 people treated at Community Health Center of Jati Kudus with range aged 17-35 years, then got 89 respondents were obtained using the purposive sampling technique. The instrument used was a questionnaire. Results: From the results of univariate data testing, 65 respondents (73%) had good knowledge of COVID-19, while those who had sufficient knowledge were 24 people (27%). The results showed that all respondents complied with the prevention measures for COVID-19 with a percentage of 100%. Based on the bivariate test result, it was found that there was a relationship between the level of knowledge and compliance in preventing transmission of COVID-19 with a p-value of 0.034 and r (correlation coefficient) of 0.225. Conclusion: it can be concluded that there was a relationship between the level of community knowledge about COVID-19 and compliance with COVID-19 prevention at the Public Health Center of Jati Kudus.

INTRODUCTION

Community knowledge about COVID-19 is one of the serious and important things that must be known by the public. If the level of community knowledge about COVID-19 is still low, it will have an impact on the increasing number of COVID-19 cases worldwide. Therefore, community knowledge about COVID-19, especially the prevention of COVID-19, is important to break the chain of transmission of COVID-19. Coinciding on January 30, 2020, WHO declared COVID-19 as a Public Health Emergency of International Concern (PHEIC). Then, on February 12, 2020, WHO has determined that COVID-19 in humans is known as Coronavirus Disease.[1]

According to WHO in the Task Force for the Acceleration of Handling COVID-19 dated July 27, 2020, data on cases of the spread of COVID-19 globally in 216 countries, 16,096,741 cases were confirmed positive for COVID-19.[2] The prevalence of positive confirmed cases of COVID-19 in Indonesia is still quite high. Indonesia is in 24th position in the list of countries with the most cases of

COVID-19 [3]. Central Java as of July 27, 2020, as a province that ranks fourth, namely 8,412 confirmed positive cases of COVID-19 with the highest addition of positive patients in Indonesia, after East Java (20,539 confirmed positive cases of COVID-19), DKI Jakarta (19,125 confirmed positive cases) COVID-19), and South Sulawesi (8,881 confirmed cases of COVID-19).[4]

Kudus Regency is one of the districts in Central Java that is still in the red zone along with three other areas in Central Java, namely the cities of Semarang, Jepara, and Demak. Based on the report of the Task Force for the acceleration of handling COVID-19 in Kudus Regency on July 28, 2020, 8:00 p.m. WIB, there were 769 confirmed cases with details of 595 cases in the area covering Bae 60 cases, Dawe 32 cases, Gebog 30 cases, Jati 137 cases, Jekulo 84 cases, Kaliwungu 64 cases, Kota Kudus 92 cases, Mejobo 53 cases, Undaan 43 cases. Meanwhile, the number of cases outside the district of Kudus was 174 cases.[5]

Efforts to break the chain of the spread of COVID-19 require good understanding and knowledge from all elements including society.[6] According to Mona, defining the knowledge of COVID-19 patients is the result of the patient's curiosity about everything related to his disease. Knowledge of COVID-19 prevention with community compliance to take precautions has a very important role in anticipating recurring events.[7]

The results of the study [7] show that there is a relationship between public knowledge and compliance with using masks as an effort to prevent COVID-19. The results of the study[8] indicated that gender had a significant relationship with knowledge about the prevention of COVID-19 with $p = 0.013 < 0.05$. Age, education, work status, and position in the family do not have a relationship with knowledge about COVID-19 prevention. Based on these two journals, the author wants to develop existing research. Devi & Nabila's research only

focuses on preventing COVID-19 regarding compliance with the use of masks. So, in this study, the authors want to examine the level of compliance with COVID-19 prevention, not only adherence to wearing masks but covering all COVID-19 prevention measures.

The results of the research on "Survey data of COVID-19-related knowledge, attitude, and practices among Indonesian undergraduate students", show that gender, place of residence, education major, and occupation affect students' knowledge, attitudes, and practices towards the prevention of COVID-19 in Indonesia.[9]

Success in carrying out COVID-19 prevention depends on people's compliance with infection control measures, which are greatly influenced by their knowledge, perceptions, and practices of the COVID-19 pandemic.[10] According to H.M Hartopo as the acting Regent of Kudus, conveying the level of compliance of the people of Kudus Regency with the prevention of COVID-19, if previously it tended to increase by 60-70%, now it has decreased to 50%. From data from the Kudus District Health Office, Jati Subdistrict is one of the sub-districts in Kudus Regency which is in the first position with the most COVID-19 cases in Kudus.[11] So, the research aims to find out the relationship between the level of community knowledge about COVID-19 and compliance with COVID-19 prevention at Jati Kudus Public Health Center.

METHODS

This research uses quantitative analytic research with a cross-sectional approach, which is a type of analytic research that focuses on time measurement and research of the dependent and independent variables simultaneously at one time.

The variables of this study include the level of community knowledge about COVID-19 as an independent variable and compliance

with COVID-19 prevention as the dependent variable.

The population in this study was 115 people. So that the sample of this study amounted to 89 people who were calculated by the proportion estimation formula. Purposive sampling technique was used in determining the respondents who will be used as research samples, namely, visitors who seek treatment at Jati Kudus Public Health Center, aged 17-35 years old and willing to become respondents by signing an informed consent which is part of the inclusion criteria. This research was conducted at BLUD UPT Jati Kudus Public Health Center in January-February 2021.

The data collection procedure used a questionnaire. The questionnaire for the variable level of public knowledge about COVID-19 uses the Guttman scale and for the compliance variable to prevent COVID-19 using a Likert scale that has been tested for validity and reliability.

This research has received permission from the institution where the research was conducted by paying attention to ethics in research such as beneficence, respecting human dignity, and obtaining justice. Before the respondents filled out the questionnaire, informed consent was explained first. So, respondents have the right to choose whether they are willing to be respondents or not.

After the questionnaire is collected, data processing will be carried out. The steps in the data processing process include editing, coding, tabulating, and data entry. Data analysis in this study used univariate analysis and bivariate analysis using SPSS. The statistical test uses parametric statistics, namely the Pearson Product Moment correlation.

RESULTS

The results of the study are presented in a tabular form consisting of the characteristics of the respondents, univariate and bivariate results.

Based on table 1, it is found that the gender of the respondents is mostly women as many as 57 respondents (64%) with ages 26-35 years as many as 48 respondents (53.9%). The domination of the respondent's job, namely 18 respondents (20.2%) who had not worked, the latest high school / equivalent education was 63 respondents (70.8%), and as many as 46 respondents (51.7%) were married.

Table 1
The Frequency Distribution of Respondent Characteristics (n=89)

Variable	f	%
Gender		
Male	32	36
Female	57	64
Age		
17-25 years	41	46,1
26-35 years	48	53,9
Occupation		
Administration dan graphic design	1	1,1
Pharmacist	1	1,1
Unemployment	18	20,2
Labor	7	7,9
Factory workers	2	2,2
Freelancer	1	1,1
Teacher	4	4,5
Housewife	14	15,7
General employees	12	13,5
Contractor	1	1,1
College student	8	9
Student	2	2,2
Nurse	1	1,1
Breeder	1	1,1
Odd Jobs	2	2,2
Private Workers	5	5,6
Farmer	1	1,1
Entrepreneur	8	9
Education		
Elementary School	2	2,2
Junior high school	6	6,7
Senior high school	63	70,8
Diploma	3	3,4
Bachelor degree	15	16,9
Marital Status		
Married	46	51,7
Single	43	48,3

Source: Primary Data, 2021

Based on figure 1, the results show that the most parameters for the level of public knowledge about COVID-19 are about the

transmission of COVID-19, which is as many as 84 respondents. While, the lowest level of knowledge was about the etiology of COVID-19, namely 66 respondents.

The result found that the respondents have good knowledge of as many as 65 people (73.0%) while those who have sufficient knowledge are 24 people (27.0%).
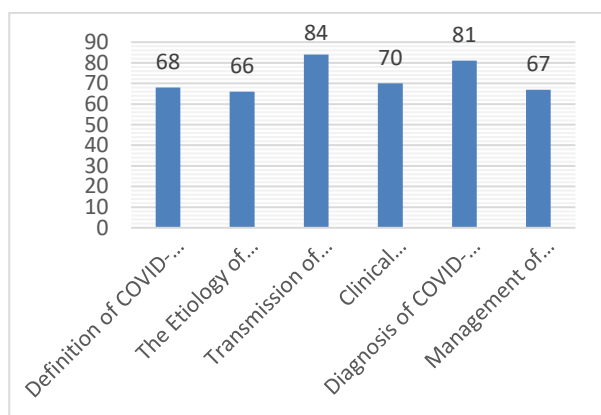

Figure 1
Parameters About the Knowledge Level of COVID-19

The result shows the results of the mean scores of 3 and 4. For the statement, a score of 3 means agrees while a score of 4 means strongly agrees. For an unfavorable score of 3, it means disagree and a score of 4 means strongly disagree. The results showed that the most parameters regarding mistakes in preventing COVID-19 were wearing masks as many as 88 respondents. While the lowest parameter regarding prevention of COVID-19 is about keeping a minimum distance of 1 meter.

Based on the result showed that all respondents prevention COVID-19 which is 89 respondents (100%). According to the Indonesian Ministry of Health (2020), COVID-19 transmission from one individual to another is indicated by symptoms of fever, sore throat, cough, shortness of breath, and some individuals test positive for asymptomatic COVID-19.[12]
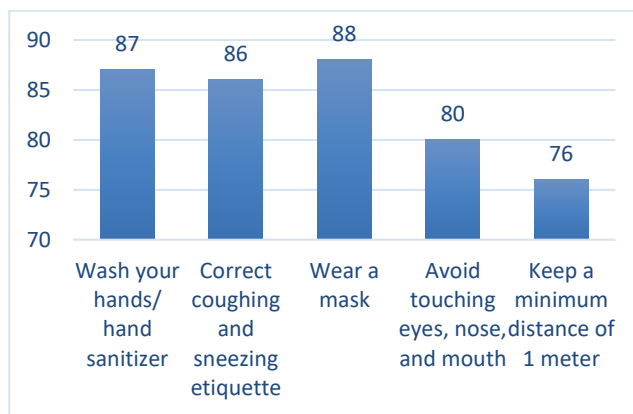
Figure 2
The Parameter Description Questionnaire Regarding Compliance to Prevent COVID-19

The results of the bivariate analysis using the Pearson Product Moment Correlation test in table 2 shows the results of the analysis of the relationship between the level of knowledge and adherence to prevention, obtained p-value = 0.034 < (0.05) so that Ha is accepted and Ho is rejected, meaning that there is a relationship between the level of community knowledge about COVID-19 and compliance the prevention of COVID-19 at Jati Kudus Public Health Center. As for the value of the degree of correlation values obtained r = 0.225 means to have a weak correlation. If the Pearson Correlation value is 0.21 to 0.40, it is said that the correlation is weak.

Table 2
The Analysis of the Level of Knowledge About COVID-19 with Compliance to Prevent COVID-19 (n=89)

| Indicators | Compliance Prevention of COVID-19 | | | | p |
| | Comply | | No Comply | | |
	f	%	f	%	
Level of Knowledge					
Good	65	73,0	0	0,0	0,034
Sufficient	24	27,0	0	0,0	

DISCUSSION

The respondent's level of knowledge about COVID-19 at the Jati Kudus Public Health Center, it can be concluded that

respondents who had good knowledge were 65 people while those who had sufficient knowledge were 24 people. The results of this study are in line with research[13], where the majority of the level of knowledge of the people of North Sulawesi about COVID-19 is in a good category, namely 388 people. "The people of North Sulawesi already know that COVID-19 can cause death, not all people infected with COVID-19 show signs and symptoms, the incubation period for COVID-19 is 2-14 days, signs and symptoms of being infected with COVID-19, ways of transmitting COVID-19, prevention of transmission of COVID-19, and immediate isolation for people who have direct contact with someone infected with Covid-19".[13]

The other research is also in line with this research where most of the knowledge level of the people of Murtajih Village, Pademawu District is good 32 people (51.6%).[14] According to Astutik, the factors that influence a person's knowledge are age, education, experience, information, socio-culture and economy, and environment.[15] In this study, most of the respondents were aged 26-35 years. This shows that the older a person gets, the more experience he gets so that the knowledge gets better, but the ability to remember knowledge will decrease as a person gets older.[16]

The results of the univariate analysis of compliance with COVID-19 prevention showed that all respondents complied with the prevention of COVID-19, with as many as 89 people. This is in line with research [7] which shows that most people obey using masks, as many as 46 respondents.

The results of this study differ from other research showing that as many as 89 respondents of COVID-19 volunteers did not comply with the protocol for preventing the transmission of COVID-19.[17] The majority of North Sulawesi people have a positive attitude towards COVID-19, as many as 396 respondents.[13] "The positive attitude of the people of North Sulawesi is the importance of wearing a mask when

leaving the house during the pandemic, not traveling outside the house if there is no urgent need, having to maintain a distance of at least 1.5 meters, avoiding crowded places during the pandemic, washing hands using soap or hand sanitizer. , immediately take a shower and wash your hair after arriving at home and wash all used clothes outside the house and get adequate rest, exercise diligently, and consume nutritious foods to increase immunity.[13]" This positive attitude can also be interpreted as public compliance with COVID-19 prevention measures.

The results of the bivariate analysis of the relationship between the level of public knowledge about COVID-19 and compliance with taking preventive measures for COVID-19 with the Pearson Product Moment Correlation Test obtained p-value = 0.034 <α (0.05). This means that there is a significant relationship between the level of community knowledge about COVID-19 and compliance with COVID-19 prevention measures. As for the degree of relationship value, the value of r = 0.225 is obtained, meaning that it has a weak correlation.

This research is in line with research conducted by Sari and 'Atiqoh (2020) which states that there is a relationship between public knowledge and compliance with wearing masks. Evidenced by the results of the bivariate analysis to test the relationship between knowledge and compliance with the community using masks with the Chi-Square test using fisher exact, the value of p = 0.004 <α (0.05) was obtained.

In the analysis of this study, most of the respondents had not worked, namely 18 people. This means that the majority of respondents in this study are not from the professional group. However, the results showed that the level of knowledge in the category was sufficient for 65 people, and for the category was enough for 24 people. As for the compliance variable in preventing COVID-19, it shows that all respondents

have complied with COVID-19 prevention measures. According to Sumartini (2020), states that respondents who have not worked have a lot of time to explore and get information from various mass media sources. Besides, people who have not worked can often attend counseling held by students or health workers because they have a lot of free time.[16]

In theory, a person's education level will affect their level of knowledge. If the level of education and knowledge is good, then the behavior will also be good.[18] This study shows that most of the respondents' last education was Senior High School or equivalent. This is in line with the other research that the highest educational characteristics were mostly Senior High School as many as 59 people, while the smallest was Master degree graduates as many as 4 people. Apart from formal education, information or knowledge can be obtained from various sources, namely through other people and the mass media. So, low education does not mean having low knowledge. However, the higher a person's education, the easier it will be to receive the information obtained so that his knowledge will increase.[16]

Education about health will affect one's health behavior, this is because the education obtained will gain knowledge and have an impact on one's behavior in preventing disease. So, someone who has good knowledge regarding healthy behavior will tend to have good behavior towards health. Therefore, to increase healthy behavior, it is also necessary to increase knowledge.

According to the preliminary study, the highest number of COVID-19 cases was in Jati District. However, after doing research it shows that the level of knowledge of the majority of the community is good. As for compliance with the prevention of COVID-19, all respondents fall into the obedient category. This happened because when researchers conducted a preliminary study in July 2020, Kudus Regency was included in the red zone and Jati District was the district with the greatest number of COVID-19 cases. While the research was conducted in January-February 2021, in which Kudus Regency has entered the green zone. So, during that time the community had received a lot of information from various media or the local government.

CONCLUSION

After conducting the research, it can be concluded that there is a relationship between the level of public knowledge about COVID-19 and compliance with COVID-19 prevention at Jati Kudus Public Health Center.

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CONFLICTS OF INTEREST

Neither of the authors has any conflicts of interest that would bias the findings presented here.

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Original Research

Correlation Knowledge to Hypothermic Handling Practices in Students

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Article Info

Abstract

Hypothermia is a decrease in core body temperature to <35°C due to heat loss. Factors causing hypothermia are cold weather, exposure to cold winds at high altitudes, immersion in cold water, and prolonged exposure to cold. Hypothermia is more common in hikers or mapala because they do activities exploring the highlands. The purpose of this study was to determine the relationship between knowledge of hypothermia and the practice of handling hypothermia in Mapala. This study used a correlation study method with a cross-sectional approach. The population in this study were Mapala UNISSULA, UNNES, and USM with a total of 52 students. The sampling technique was purposive sampling, the number of samples of this study was 30 students. The results of the Spearman Rank statistical test obtained a value of ρ value of 0.738 (ρ ≥ 0.05), so it was stated that there was no relationship between knowledge of hypothermia and the practice of handling hypothermia in Nature Lovers Students. Recommendations from research so that mapala members increase their knowledge and practice in handling emergency hypothermia by conducting ongoing training.

INTRODUCTION

Cold is a low-temperature environment compared to the human core body temperature which is 15°C, the human core body temperature is around 37°C. Cold can cause injury when the body is unable to maintain core temperature.[1–3] Cold injuries that can occur are hypothermia, frostbite, chilblains, trench foot and allergic reactions to cold.[1,2] Hypothermia causes deaths of up to 700 people per year in the US during the 20 years from 1979-1998, half of them due to cold weather.[3,4] In Canada, 411 people died from hypothermia, frostbite, and other cold injuries during 1992-1996.[5]

Hypothermia is a condition where the body temperature drops abnormally low below 35°C due to heat loss. Loss of body heat occurs in four ways: conduction, radiation, convection and evaporation. The severity of hypothermia was defined based on core temperature, namely: mild hypothermia (32°-35°C), moderate hypothermia (28°-32°C) and severe hypothermia (below 28°C).[3,6] Factors causing hypothermia are cold weather, exposure to cold winds at high altitudes, immersion in cold water, and prolonged exposure to cold. Factors that can aggravate hypothermia include wet clothes, fatigue, dehydration, poor food intake, alcohol intake and drugs.[1,2,7]

Complications that can occur from hypothermia are disturbances in the response to thermoregulation, cellular dysfunction, ischemia, oedema. Hypothermia can reduce cardiac contractility due to tissue depletion, blood pressure will decrease until shock occurs. Hypothermia can reduce consciousness to become apathetic, loss of reflex swallowing and aspiration. Oedema and ischemia from hypothermia put the muscles in stiffness and are at risk for rhabdomyolysis. Also, hypothermia can reduce cognitive function and impair neuron conduction which can lead to death.[2,4,5,7]

Treatment of hypothermia is based on preventing further heat loss and rewarming the hypothermic victim. Handling hypothermia based on severity, mild to moderate hypothermia reduces heat loss with an additional layer of dry clothes and increases physical activity slowly in a protected environment, intake of warm fluids and sugar helps provide calories plus a source of heat, providing blankets, body-to-body contact. which is normothermic. Severe hypothermia should be protected from any humidity in the environment, use multiple sleeping bags; blankets and clothing to keep a minimum distance of 10cm between the victim and the floor. Active external heating using a hot water bottle, warm stone or warm compress towel is placed on the surface of the body that is the main artery, on the neck for the carotid, in the axilla for the brachial, in the groin for the femoral, on the palms for the arch of the artery. Severe hypothermia causes gastroparesis but the stomach can absorb water and sugar, give warm sugar water every 15 minutes.[2,4,5]

Hypothermia occurs because a person is in cold weather, exposed to cold winds at high altitudes, immersed in cold water, and prolonged exposure to cold.[1,2,7] Hypothermia is more common in climbers, climbers admit that hypothermia is a risk they will experience when exploring the highlands with cold temperatures and strong winds, as well as when using wet wear.[8-10] Factors that aggravate the occurrence of hypothermia in climbers besides using wet clothes are fatigue or the climber's stamina.[11-13]

A climber in Semarang who joined the Unissula nature-loving student community (mapala) died on the mountain due to fatigue and hypothermia while participating in a one-week education and SAR training activity with 25 other students.[14] Besides, students of SMKN 10 Semarang died while climbing Mount Merbabu due to hypothermia.[15] Cold-related injuries can be prevented by proper education, preparation and response to changes in ambient temperature.[7] Mountain climber first aid education should be improved, education should take into account the special demands of a mountain emergency.[16,17]

Knowledge and attitudes are important to be maintained and improved in providing intervention in cases of hypothermia.[18] The knowledge and practice of mothers and professional nurses regarding hypothermia are grossly inadequate in various evaluations.[19] Based on this description, research needs to find out more about "The Relationship of Knowledge about Hypothermia to Hypothermia Management Practices in Nature Lovers Students (Mapala)".

METHODS

This research is a quantitative study using a correlation study method (cross-sectional). The population in this study were all Mapala UNISSULA, UNNES, and USM totalling 52 people. Determination of the sample using purposive sampling technique and analyzed with the sample correlation technique, the sample must be taken at least 30. The inclusion criteria were joining mapala, having participated in climbing, having practised handling hypothermia while climbing, and students majoring in non-health majors. The exclusion criteria for the

study were being sick, members of Mapala who were no longer active, students majoring in health, members of Mapala who were not students. The research was conducted at the base camp each Mapala in May-June 2017. Collecting data using a questionnaire compiled by the researcher, the questionnaire has been carried out by expert testing on emergency nursing experts as well as validity and reliability tests.[20–23]

RESULTS

Based on Table 1.1 the results of the research statistical test using the Spearman Rank correlation test, the correlation coefficient value is -0.064 with a ρ value of 0.738 (ρ≥0.05), meaning that Ho is accepted so that it is stated that there is no relationship between knowledge about hypothermia and the practice of handling hypothermia. in Nature Lovers Students (Mapala). It is known that most of the respondents practised handling hypothermia in a good category as many as 16 people (53.3%), and 14 people (46.7%) had bad practices. There are still practices that are in the bad category of 46.7% because 40% of respondents have not received PPGD (Emergency First Aid) education while 60% have the possibility of getting PPGD education for a long time. Apart from PPGD education, what affects bad practice is the experience of climbing the respondent at least 1 time, 4 people and only 1 person at most 27 times.

Table 1.1 Correlation of knowledge about hypothermia with hypothermia management practices at Mapala UNISSULA, UNNES, and USM, May - June 2017

Variable	R	P
Correlation of knowledge with hypothermic treatment practices	- 0,064	0,738

DISCUSSION

Factors that significantly affect knowledge are education, mass media or information, socio-culture and economy, environment, experience, and age. The results showed that most of the respondents' knowledge was categorized sufficient, namely as much as 56.7%, the good category was 40% and the poor category was 3.3%. Respondents who have not received PPGD education are as much as 40% while those who have already been 60%. Experience is used as a source of knowledge by repeating the knowledge obtained to solve a problem encountered in the past and as you get older, your perceptive power will develop as well as one's mindset so that the knowledge gained is getting better.[24–29]

The youngest respondents were 16 years old and the oldest was 23 years old with an average age of 20 years. The respondent has experienced climbing at least once, the value of his knowledge is sufficient and the practice is good. While the experience of climbing is at most 27 times, the value of knowledge is good and the practice is not good. Knowledge is sufficient but good practice and good knowledge but bad practice are probably influenced by the number of times the respondent performs treatment practices on hypothermic victims.[24–27]

This research is supported by the fact that there is no relationship between maternal knowledge, mother's education and husband's support with the practice of exclusive breastfeeding.[30] Mothers who provide exclusive breastfeeding to their children have high knowledge, in addition to the experiences of mothers and information received by mothers from Health workers and the work environment motivate mothers to exclusively breastfeed.[31] Mothers have satisfactory knowledge of hypothermia, practical applications of mothers who have very poor knowledge.[25]

CONCLUSION

Hypothermia management practices in Mapala UNISSULA, UNNES, and USM were in a good category. There is no correlation

between knowledge of hypothermia and the practice of handling hypothermia among Nature Lovers Students (Mapala).

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CONFLICTS OF INTEREST

Neither of the authors has any conflicts of interest that would bias the findings presented here.

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Case Study

Application Of Predialytic Exercise To Reduce Fatigue In-Patient Undergoing Hemodialysis

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Article Info	Abstract
	Chronic kidney disease is an irreversible and slow-progressing disorder of kidney function so that the kidneys are unable to maintain the body's metabolism, fluid and electrolyte balance and cause uremia which requires dialysis or kidney transplantation. Hemodialysis is management to treat chronic kidney disease that is carried out for life so that the complications that often arise are fatigue, cramps, anxiety, pain. The phenomenon found in the Hemodialysis Room of the Tugurejo Hospital Semarang, there were 34% of the 84 patients who experienced fatigue which was characterized by lethargy, weakness, drowsiness, dizziness. This research is a quantitative study with a quasi-experimental design. The sample size is 4 respondents in the intervention group without a control group. Measurement of the level of fatigue (pre and post-test) using the PFS (Piper Fatigue Scale) which contains 22 subjective statements. Predialytic Exercise intervention is given for 5 sessions with a duration of 10-15 minutes. The results of this study indicate that the fatigue level of hemodialysis patients has decreased after the intervention of predialytic exercise for 5 sessions. The fatigue score of respondents 1 has decreased from a score of 4.8 (moderate fatigue) to 3.2 (mild fatigue), respondent 2 from a score of 6.3 (moderate fatigue) to 4.3 (moderate fatigue), respondent 3 from score 9 (severe fatigue) to 7 (severe fatigue), and respondent 1 from a score of 4.9 (moderate fatigue) to 2.4 (mild fatigue). The results of this study indicate that there is a decrease in each dimension of fatigue levels so that predialytic exercise intervention is effective to reduce fatigue in patients undergoing hemodialysis.

INTRODUCTION

Chronic kidney disease (CKD) is an irreversible and slow disruption of kidney function therefore unable to maintain the body's metabolism, fluid, and electrolyte balance cause uremia which requires dialysis or kidney transplantation. There are 70,000 sufferers of CKD in Indonesia, and it will be increased every year by up to 10%. Data from the Indonesian Ministry of Health (2017), 30,554 active patients were undergoing dialysis, 1,243 patients died with 1-317 months of HD time. Indonesian Renal Registry data (2016), states that as many as 98% of CKD sufferers undergo hemodialysis therapy and 2% of Peritoneal Dialysis (PD) therapy with the most common causes of CKD are diabetic nephropathy (52%), hypertension (24%).[1,2]

The majority of people with CKD need therapy in the form of hemodialysis. Hemodialysis is a process of cleansing the blood using an artificial kidney, namely a dialyzer with the goal is to maintain good nephron function, reduce morbidity, reduce uremia pericarditis, uremia encephalopathy, fluid overload, nutritional disorders, and infections, therefore, the quality of health and the quality of life among patients is improved. The hemodialysis process takes 4-5 hours generally will cause side effects such as physical stress, fatigue, headaches, cramps, and cold sweat due to decreased blood pressure and sugar levels. [3,4]

Fatigue is a feeling of excruciating characterized by a constant decrease in strength or physical and mental labor. Fatigue is a problem that is most often felt as a side effect of CKD sufferers undergoing hemodialysis which can cause physical, social, and psychological problems that interfere with daily activities and the patient's quality of life. Fatigue is caused by changes in health conditions, sleep disorders, psychological disorders and poor nutritional status. [4–6]

Non-pharmacological interventions that can be given to CKD patients with hemodialysis with fatigue are progressive Muscle relaxation, range of motion, and breathing exercises or predialysis Exercise. Predialytic exercise can be increasing blood flow, and the number of capillary areas in the muscles, so it can reduce the occurrence of complications such as fatigue, muscle cramps, and anxiety.[6]

Based on the explanation before, therefore, this study aims to determine the effect of predialytic exercise on the level of fatigue in patients undergoing hemodialysis at Tugurejo Hospital, Central Java, Indonesia.

METHODS

A quasi-experimental design on one group (intervention group) with pre and post-test was used in this study. The population was patients with chronic kidney disease in the Hemodialysis Installation of Tugurejo Hospital, Central Java, Indonesia. Based on initial data, there were 86 patients who underwent hemodialysis as routinely.

The sampling technique is convenience sampling, where the researcher selects the sample at the study site according to the research criteria until the number of research samples is obtained. Patients who meet the criteria will be recruited as respondents.

This study uses the Piper Fatigue Scale (PFS) to measure the fatigue level of hemodialysis patients. PFS instrument can represent the subjective feelings of the respondents in expressing their fatigue. Data collection was carried out before and after being given for 5 meetings with a duration of 10-15 minutes.

This study was conducted by emphasizing the principles of research ethics including the consent form, anonymity, and confidentiality. Respondents who were willing and agreed become respondents were asked to fill out a questionnaire. Before treatment, respondents were explained. The univariate analysis aims to describe the characteristics and level of fatigue among respondents.

RESULTS

The implementation of the predialysis exercise in patients with chronic kidney disease in the Hemodialysis Unit of Tugurejo Regional Hospital was carried out from May 9, 2019, to May 23, 2019, with 4 patients as respondents who met the inclusion and exclusion criteria. The results of the research analysis are as follows:

Table 1
Frequency Distribution Characteristics of
Respondents with Chronic Kidney Disease who
Underwent Hemodialysis Semarang (n=4)

Indicators	f	%
Age		
<30 years old		
31 – 40 years old	1	25
41 – 50 years old		
>50 years old	3	75
Gender		
Male	4	100
Female		
Education Level		
Primary high School		
Junior High School		
Senior High School	4	100
Perguruan Tinggi		
Marital Status		
Unmarried		
Married	3	75
Widow/Widower	1	25
Length of hemodialysis		
< 12 month	2	50
12 – 24 month	2	50
> 24 month		

Based on data on the characteristics of respondents (table 1), it shows that most (75%) aged> 50 years and all respondents are male and had a high school education level. As many as 3 respondents (75%) are married and 1 respondent (25%) are widowers, while for the duration of HD, 2 respondents (50%) underwent 12-24 months of HD and 2 respondents (50%) underwent HD> 24 months.

Respondents were given intervention in the form of predialysis exercise with a combination of progressive muscle relaxation movements, range of motion, and breathing exercise. The movements in this physical exercise are combined with the same principle of stretching and relaxing the muscles in the face, neck, shoulders, hands/arms, and legs. Exercises were given before the hemodialysis process started for 5 meetings on Monday and Thursday according to the respondent's schedule for hemodialysis. The duration of the intervention was 10-15 minutes with each movement of 8 beats and accompanied by music. For the first time doing this physical

exercise, the respondents did not optimal in following the movements because they were afraid that they would cramp or make their muscles hurt and interfere with the hemodialysis process. The benefits of this physical exercise began to be felt after 3 times after undergoing routine interventions.
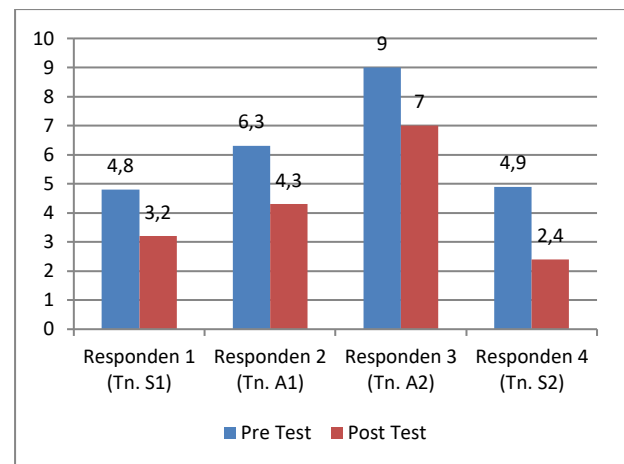
Figure 1
Frequency Distribution Score of Fatigue Level
Before and After Predialytic Exercise

Figure 1 shows a decrease in the level of fatigue in the four respondents, where respondent 1 from a score of 4.8 (moderate fatigue) to 3.2 (mild fatigue). Respondent 2 from a score of 6.3 (moderate fatigue) to 4.3 (moderate fatigue). Respondent 3 from score 9 (severe fatigue) to 7 (severe fatigue). Respondent 4 from a score of 4.9 (moderate fatigue) to 2.4 (mild fatigue). The average fatigue score was 6.25 (moderate fatigue) in the pre-test and the average fatigue score was 4.25 (mild fatigue) in the post-test. The results showed that there was a decrease in the level of fatigue after being given the intervention of predialysis exercise (post-test) for 5 meetings, namely 2 respondents (50%) had mild fatigue, 1 respondent (25%) moderate fatigue, and 1 respondent (25%) weight fatigue.

The value of the fatigue level before the intervention was carried out with a minimum fatigue level of 4.8 and a maximum of 9. Before being given the

intervention, the respondents were in a fairly varied range of fatigue scores. There is one respondent with a score of fatigue 9, this is due to the age factor (> 50 years).

The subjective results obtained from the four respondents said that their body condition was better after HD was done and would have a maximum health status 1 day after HD, however, respondents would feel significantly tired after 2-3 days after HD. During HD, the four respondents said they prefer to use their time to sleep or close their eyes. Two respondents can sleep soundly during HD (1-2 hours) and two respondents can only close their eyes without sleeping soundly.

According to a statement from the respondent, the cause of the excessive fatigue because he was always feeling unhappy. He said he was not on good terms with his wife so when he was homemade he wants to be angry. He said that he was irritable and emotional. Another respondent said that the fatigue was due to not having much activity and that his feet were often swollen which interfered with his activities. The four respondents had poor sleep quality, indicated by sleep time that was only 3-4 hours a day, often waking up at night and having difficulty starting to sleep again, waking up sluggish is a factor that adds to fatigue.

DISCUSSION

The data showed that respondents' fatigue level was varied according to age. Age is a factor that can affect individual health. CKD sufferers who undergo HD age over 40 years are at risk of various complications that can interfere with the quality of life, including fatigue. Solomon's explained that the older a person is, the physical condition will weak and lead to fatigue condition. [7]

Decreased physical condition at old age results in higher levels of fatigue. Fatigue appears as a result of various factors, including physiological factors (anaemia, malnutrition, uremia, hyperparathyroidism, inflammation) which arise from chronic kidney disease. [8] Complaints of fatigue in patients undergoing hemodialysis due to many factors, including poor nutritional status, psychological disorders, changes in health conditions, and poor sleep disorders.[4,9]

This study showed that there was a decrease in the level of fatigue after being given the intervention of predialysis exercise (post-test) 5 times having mild fatigue levels. These results support a study that physical exercise is effective in reducing fatigue levels in chronic kidney disease patients undergoing hemodialysis. [8] The benefits of physical exercise began to be felt by the respondents, especially from the fourth week onwards. At the beginning of the exercise, the average respondent said they were afraid to do physical exercise, for fear of interfering with the hemodialysis process.

Regular physical exercise can increase blood flow to the muscles, increase the number of capillaries and increase the area and surface of the capillaries, thereby increasing the movement of urea and toxins from the tissues to the vasculature which are then flowed to a dialyzer or hemodialysis machine. Physical exercise can also show improvements in body fitness, physiological function, agility, reducing levels of fatigue, agility and increasing muscle strength. [8] This physical exercise is also able to relax respondents, improve overall circulation, and lower blood pressure. [6]

Apart from physical exercise, internal and social motivation is also needed to support the survival of HD patients. Patients who do physical exercise are likely to experience fewer complications. [10] Many of the patients whose hemodialysis process is delivered and awaited by the family make the patient comfortable. Lifestyle must also be maintained, especially fluid restrictions to reduce oedema of the extremities or

pulmonary oedema so that heart and lung function is easier and reduce fatigue or shortness of breath. [11]

CONCLUSION

Predialysis exercise has a positive effect to decrease fatigue level for dialysis patients. Predialysis exercise can be applied in the hemodialysis unit to reduce the level of fatigue and may improve the quality of life. The initial measurement carried out on the first day before the intervention was moderate fatigue and the second measurement after 5 times given the intervention was decreased to mild fatigue. Hemodialysis nurses are expected to apply predialysis exercise as nursing care for decreasing the fatigue level of hemodialysis patients.

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CONFLICTS OF INTEREST

Neither of the authors has any conflicts of interest that would bias the findings presented here.

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High Flow Nasal Cannula Oxygen Therapy in Long Hauler Covid-19 Patients

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Article Info	Abstract

Long Hauler Covid-19 is a condition that describes a person who has recovered from Covid-19 and is declared with a negative PCR smear 2 times but still feels signs and symptoms for a longer period of time, even severe and critical symptoms. Most cases complicate Acute Respiratory Disorder Syndrome (ARDS), which can lead to death. Fulfilment of non-invasive high concentration oxygenation requirements as an intervention modality in this case. The purpose of this case study was to determine the effect of giving oxygen therapy through the High Flow Nasal Cannula (HFNC) on the respiratory function of Covid-19 long haulier patients. The method of nursing care was a case study on 2 respondents with a descriptive approach method. There were 2 cases of Long haulier Covid-19 patients with comorbid smokers, Diabetes Mellitus, experiencing moderate ARDS complications, desaturation, and tachypnea. Patients received oxygen therapy intervention through HFNC while being treated in the critical care room, and after being given HFNC oxygen therapy for 5 days there was a decrease in respiratory frequency, a change in breathing pattern from shortness of breath to shortness of breath, an increase in oxygen saturation, an increase in the ROX Index, an increase in PO2 and blood pH in normal limit. Nursing care that focuses on respiratory management in covid-19 long haulier patients improves patient outcomes in particular, namely decreased respiratory rate, changes in the respiratory pattern of shortness of breath, increased oxygen saturation, increased ROX index, increased PO2 and blood pH within normal limits.

INTRODUCTION

Long hauler Covid-19 is a term that describes the phenomenon of symptoms experienced by patients after being infected with COVID-19.[1] Someone who has recovered from Covid-19 and tested negative but still feels signs and symptoms for longer.[2] The symptoms felt by sufferers of Covid-19 vary. About 80% of people with Covid-19 experience mild symptoms and can recover in just two weeks. However, there are also those who experience a severe response that takes three to six weeks. A person is said to have a Covid-19 long hauler if he is infected with the corona virus and experiences symptoms for 28 days or more after being infected. A research and survey published in August 2020 showed that 50-80% of sufferers still

experience disturbing symptoms within 3 months of recovering from COVID-19.[3]

Health workers and researchers have focused on the acute phase of Covid-19, but follow-up monitoring after discharge for long-term effects (long hauler Covid-19) is needed. Of the patients recovering from COVID-19, around 87.4% said that there was at least one persistent symptom, especially fatigue and dyspnea. The most common symptoms are fatigue, shortness of breath, cough, joint pain, and chest pain.[4] While long-term symptoms include difficulty thinking and concentration, depression, muscle aches, headaches, chest pain, intermittent fever, tachycardia.[3, 5]

The phenomenon of Covid-19 long hauler patients at Tugurejo Hospital who have severe symptoms is treated in the Covid-19 ICU room, but if the results of PCR swabs that have been carried out 2 times in a row are negative and require critical care 19. This patient who has tested negative for Covid-19 still feels symptoms of dyspnea, fatigue, joint pain, reduced muscle function, impaired ability to perform daily activities, and mental health problems such as post-traumatic stress disorder, anxiety, and depression. The number of long hauler cases covid-19 in December 2020-February 2021 was 30 patients. There were 15 patients given oxygen therapy through HFNC, 5 patients received oxygen therapy through mechanical ventilation, 7 patients received oxygen through a non-rebreathing mask, 3 patients received oxygen therapy through a nasal cannula and 1 patient experienced worsening conditions from HFNC oxygen therapy to a mechanic ventilator. The duration of using HFNC and the length of stay of these patients varied between 5-14 days.

The main life-threatening problem for Covid-19 long hauler patients is a problem attacking the respiratory system and some patients in the course of the disease will develop insufficient refractory hypoxemic breathing which requires mechanical ventilation. Currently, the non-invasive method of giving high concentration oxygen through HFNC is a modality in Long hauler Covid-19 patients, especially those who experience moderate and severe ARDS failure.[6, 7] Delaying or preventing mechanical ventilation procedures can reduce the need for a ventilator.[8] Nasal high-flow oxygen therapy (HFNC) allows the delivery of warm and humidified gases at a high flow rate and the appropriate fraction of inspired oxygen (FiO_2), is currently frequently used in patients with hypoxemic acute respiratory failure (HARF).[9]

A 2020 study showed that 28 patients with severe COVID-19 symptoms, 67.8% of patients with HFNC improved, 32.2% of patients failed using HFNC and needed NIV, 17.8% required intubation.[10] HFNC also plays an important role in correcting hypoxemia in about two-thirds of patients with Covid-19. From previous studies, there has been no specific study for Covid-19 long hauler patients. This case study aims to determine the effect of oxygen therapy through HFNC on specific patient outcomes, namely improving breathing patterns, lowering respiratory frequency, increasing oxygen saturation and increasing blood oxygen pressure (PaO_2) of Covid-19 long hauler patients in critical care rooms.

METHODS

This study is a case study of nursing care using pre and post test conducted on 2 respondents with a descriptive approach method. The variable of this study was HFNC oxygen therapy on the respiratory function of Covid-19 long hauler patients. This study was conducted in the critical care room of Tugurejo Hospital on February 4-February 15, 2021.

Covid-19 patients whose PCR results were 2 times negative and/or patients who had a history of Covid-19 in the past were the population of this study. The subjects of this study consisted of 2 patients obtained by

purposive sampling. Sampling according to the inclusion criteria, namely long hauler Covid-19 patients with comorbid Diabetes Mellitus who had severe breathing problems, the patient was conscious and able to communicate. Exclusion criteria of the patient were no longer able to continue the study because of severe breathlessness, worsening of the condition and requiring mechanical ventilation.

The instruments in this case study were the HFNC machine, bed side monitor, oximetry, and blood gas analysis results. Data collection procedures: a) Determine the patient according to the criteria. b) Provide informed consent to prospective respondents. c) After the prospective respondent agrees to become a respondent, the researcher contracts the time to do the research. d) Record the breath pattern, measure the respiratory frequency, oxygen saturation, and record the measurement results in the respiratory function status column before being given intervention. d) Researchers provide intervention to respondents in the form of HFNC oxygen therapy with a flow of 60 L/minute and 90% FiO2. e) Every day the patient is re-measured the respiratory function status until day 5. f) Record the measurement results in the respiratory function status column after the intervention. g) Give HFNC oxygen therapy in accordance with the development of the patient's condition every day.

RESULTS

The subjects of this case study were 2 people, consisting of male and female patients. Patient characteristics in both cases can be seen in Table 1 and the assessment results in both cases are shown in Table 2.

First case; A 52 years old male was admitted to the critical care room with complaints of severe shortness of breath, cough, swallowing pain, weakness, lack of appetite, desaturation and compos mentis

awareness. The patient had a history of diabetes mellitus with his blood sugar currently under control. The patient did not have fever, blood pressure and pulse rate were within normal limits. The results of laboratory tests of blood gas analysis obtained data on oxygen levels in the blood (PO2) 45 mmHg, the P/F ratio of the results was 50 (severe ARDS), the D-dimer test was 2030 ug/L, the blood sugar when the results were 146 g/dl and X-rays. the result typically viral pneumonia. Physical examination obtained data on complaints of severe shortness of breath, respiratory rate 31 times per minute, 88% oxygen saturation, blood pressure 126/92 mmHg, pulse 100 times per minute and temperature 36.5 ° C. Diet Low in sugar and carbohydrates. The patient experienced major nursing problems as ineffective breathing patterns and impaired gas exchange. Patients received oxygen therapy through HFNC flow of 60 liters per minute and a concentration of 90%, ROX 3.19, heparin syringe pump 10,000 IU per 24 hours, meropenem injection therapy 500 mg per 8 hours, Novorapid 0-0-10 IU (SC) and bricasma inhalation therapy combined with heparin 25,000 IU every 6 hours. Acetyl cysteine oral therapy 3 times per day. The patient received RL/Tutofusin infusion therapy 30 drops per minute.

Second case; A 58 years old woman was admitted to the critical care room with complaints of severe shortness of breath, cough, swallowing pain, weakness, lack of appetite, desaturation, restlessness and compos mentis awareness. The patient had a history of diabetes mellitus with his blood sugar currently under control. The patient did not have fever, blood pressure and pulse rate were within normal limits. The results of laboratory examination of blood gas analysis obtained data on oxygen levels in the blood (PO2) 45 mmHg, the P/F ratio was 50 (severe ARDS), ROX 2.95, the D-dimer examination was 2100 ug/L, blood sugar at 170 gr/dl and Chest X-ray results typically viral bilateral pneumonia. Physical examination obtained data on complaints of

severe shortness of breath, respiratory rate of 35 times per minute, oxygen saturation of 93%, blood pressure of 126/85 mmHg, pulse 80 times per minute and temperature of 36.3 ° C. Diet low in sugar and carbohydrates. The patient experienced major nursing problems as ineffective breathing patterns and impaired gas exchange. Patients received oxygen therapy through HFNC flow 60 liters per minute and a concentration of 90%, heparin syringe pump 10,000 iu per 24 hours, meropenem injection therapy 1 gram per 8 hours, Novorapid 14 IU per 8 hours (SC) and bricasma inhalation therapy combined with heparin 25,000 IU every 6 hours. Acetyl cysteine oral therapy 1 tablet per 8 hours. The patient received infusion therapy of RL/Tutofusin 20 drops per minute.

The nursing diagnoses that occurred in these 2 patients were ineffective breathing patterns and impaired gas exchange. Nursing problems that occur in physiological subcategory disorders are gas exchange disorders associated with increased airway resistance and decreased pulmonary complaints, hyperthermia associated with lung virus infections.[11, 12] Nursing intervention given is to measure the frequency of breathing, increase oxygen saturation and increase oxygen pressure in the blood (PaO2). Then the patient is given HFNC oxygen therapy according to the patient's needs.

Implementation of nursing measures: the patient's respiratory status is measured and the results of laboratory tests. Then the patient was given HFNC oxygen therapy with initial parameters of flow 60 and FiO2 90% for 5 days. Evaluations are carried out every day to determine the progress of the patient's condition so that oxygen administration is tailored to the patient's needs.

Table 2 shows that 2 patients after being given HFNC oxygen therapy for 5 days experienced an improvement in the respiratory frequency of patient 1, namely from 26 times/ minute to 22 times/minute and patient 2 the frequency of breathing on the first day 35 times/ minute after day 5 to 19 times/minute. The breathing patterns of patients 1 and 2 on days 1 and 5 also experienced a change from shortness of breath to not shortness of breath. The oxygen saturation in patient 1 on the first day was 94% after day 5 to 97% and patient 2 on the first day 92% after day 5 to 99%. Laboratory results PO2 of patient 1 first day 45 after day 5 to 99 and patient 2 on day 45 after day 5 to 164. Blood pH was within normal limits. The ROX index on day 5 in patient 1 became 8.82 and 10.42 in patient 2. The HFNC oxygen parameter decreased according to the development of the patient's condition each day. HFNC oxygen flow and FiO2 in patients 1 and 2 on the first day were 60 L/min and 90% after day 5 the HFNC flow and FiO2 oxygen in patient 1 were 40 L/min and 50%, the second patients were 30 and 50%.

Table 1
Patient characteristics

Indicators	Case 1	Case 2
Gender	Male	Female
Age	52 years old	58 years old
Comorbid	Diabetes Mellitus	Diabetes Mellitus
ROX	3.19	2.95

Table 2
Hemodynamic parameters and laboratory test results

		Case 1					Case 2				
Day		1	2	3	4	5	1	2	3	4	5
Parameter											
HFNC Flow		60	55	55	50	40	60	60	50	40	30
FiO2		90	80	70	60	50	90	90	80	60	50
pH		7.45	7.47	7.45	7.45	7.46	7.46	7.46	7.45	7.46	7.47
PO_2		45	46	51	67	99	45	51	71	80	164
P/F ratio		50	57.5	72.8	111.6	198	50	56	88	133	328
Breathing pattern (dyspnea)		+	+	-	-	-	+	+	-	-	-
RR		26	26	21	26	22	35	26	24	22	19
SpO_2		94	94	94	95	97	92	95	97	98	99
ROX index		4.02	4.52	6.39	6.09	8.82	2.92	4.06	5.05	7.42	10.42

DISCUSSION

The results of this case study indicate that after maximal administration of HFNC oxygen at the start of each day of administration it can be reduced according to the patient's oxygen requirements. After giving HFNC oxygen therapy to this Covid-19 long hauler patient also showed a decrease in breathing frequency, changes in breathing patterns from shortness to shortness of breath, increased oxygen saturation, and an increase in the ROX index, an increase in PO2 and blood pH within normal limits.

Severe, progressive shortness of breath and complications of ARDS often experience a happy hypoxic condition characterized by compos mentis awareness, shortness of breath, desaturation and severe hypoxemia are symptoms that often occur in Long Hauler Covid-19 patients.[13] This is in accordance with the conditions that occurred in this case study. The patient characteristics in this case study were diabetes mellitus patients. The phenomenon of Covid-19 and long hauler covid-19 patients requires intensive care and occurs in patients who have a history of diabetes mellitus because they have a very severe inflammatory response.[14] The special surface glycoproteins in ACE2 are the entry port for the Covid-19 virus. ACE2 is abundant in the alveolar type II cells of the lungs. If the amount of ACE2 in excess can worsen the patient's condition. This can lead to ARDS, damage to the liver, heart, kidneys, and even death. Patients with comorbid diabetes mellitus tend to be twice as likely to suffer from severe symptoms of COVID-19 and two times more likely to die from these symptoms.[15]

The principle of oxygen therapy with HFNC is based on a device capable of providing a high flow of oxygen demand through a warm and moist nasal cannula. This cannula can provide flows of up to 60 L/minute at a temperature of 31-37°C with an absolute humidity of 44 mg H2O/L; FiO2 varies between 21-100%. The advantages of HFNC include clearing the pharyngeal dead space, reducing respiratory effort, the effect of PEEP (Positive End-Expiratory Pressure), providing a constant fraction of inspired oxygen, patient comfort and improved muco-ciliary clearance. HFNC is also known to provide a low PEEP, which can improve the condition of patients with mild-to-moderate respiratory failure. In addition, by providing a warm, humidified gas, HFNC reduces the metabolic effort required to condition the air. HFNC is more tolerable than other ventilatory supports and reduces the incidence of intubation thus providing a good clinical prognosis in patients with acute respiratory failure.[16]

HFNC was also studied to have an important role in correcting hypoxemia in about two-thirds of patients with COVID-19 with severe hypoxemic respiratory failure who were unable to achieve SatO2 ≥ 92% with

standard oxygen therapy. A study showed 28 patients with severe COVID-19 symptoms, about 67.8% of patients with HFNC improved and could be transferred to a normal room, 32.2% of patients failed using HFNC and needed NIV, 17.8% required intubation.[10] This improvement in oxygenation is related to air flow that is in accordance with ventilation requirements, high and stable FiO2, cleaning of the upper airways, the presence of positive pressure (PEEP), and providing warm and humid air. Patients with a PaO2/FiO2 ≤ 100 mmHg are at risk of failing HFNC therapy.[10]

This case study was the initial administration of HFNC oxygen therapy with a flow of 60 L/min and a FiO2 of 90%. Every day the patient's condition shows an improvement in the status of respiratory function so that the HFNC oxygen therapy is gradually reduced. Until day 5, the HFNC oxygen therapy given was a flow of 40 L/min and FiO2 of 50% in patient 1, flow of 30 L/min and FiO2 of 50% in patient 2. A study also showed about 61.9% (65 subjects) patients show improved oxygenation and can be removed from HFNC.[17] Assessment of the ROX index at 6 hours of HFNC administration provides a predictive value for the patient's oxygenation status and a predictor of the success of HFNC therapy.[18] An ROX index of more than 5.55 at 6 hours of HFNC administration was associated with HFNC success (sensitivity 61.1% specificity 84.6%). This assessment can help the clinician to prevent a late intubation that will lead to a poor prognosis. An ROX index below 2.85 at 2 hours, below3.47 at 6 hours and below 3.85 at 12 hours is a predictor of failure of HFNC therapy.[19] In this case study, the ROX index results after administration of HFNC oxygen therapy on day 5 were 8.82 in patients and 10.42 in patients 2. The effectiveness and comfort of HFNC needed to be evaluated every 2 and 48 hours. Thrombocytopenia, increased IL-6 upon initiation of HFNC, ROX index <5.31 in the first 4 hours of HFNC therapy were independent predictors of failure of HFNC

therapy. Prolonged use of HFNC is not associated with a poor prognosis. APACHE II and PSI scores can be used to determine when intubation is needed so that it is not late.[20]

CONCLUSION

Nasal high-flow oxygen therapy is proven to be an additional option and alternative method of respiratory support in Long Hauler Covid-19 patients. This is evidenced by an improvement in the respiratory function of Covid-19 long hauler patients in critical rooms after being given HFNC oxygen therapy. This case report shows the results of improvement in respiratory function while being treated in the critical care room receiving oxygen therapy through HFNC.

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CONFLICTS OF INTEREST

Neither of the authors has any conflicts of interest that would bias the findings presented here.

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Article Info	Abstract
	Informed consent is evidence of the accountability of health service providers in the hospital. it is carried out in every carrying out the procedure of actions that have the risk of causing disability or death. Incomplete documentation of patient informed consent can reduce the quality of hospital services. the implementation of informed consent documentation in hospitals often faces obstacles. this is due to the lack of human resources and the high workload available. This case study aims to determine the filling of informed consent documentation in the patient's blood transfusion. This study uses interviews, observation and document study by developing approaches to the nursing management function, organizing functions, personnel, direction, supervision, care management, logistics management, quality assurance programs and patient safety. The results showed that in one month there were 20 patients with blood transfusions, and 11 out of 20 patients did not have informed consent. The problem that arises is the incomplete documentation of medical records at the time of carrying out blood transfusions to patients. Supervision that is not optimal is the cause of this problem.

INTRODUCTION

Hospital is a health service unit of the health service system and is a strategic element seen from the context of the number of costs incurred, where most of the health funds are absorbed in the hospital management sector, both in developed and developing countries. Medical and care services are a subsystem of the existing service system in the hospital. The form of service provided is adjusted to the patient's condition so that it is more individual.[1]

Public demand for the quality of nursing services in hospitals is felt as a phenomenon that must be responded to by nurses. Therefore, this nursing service needs to be given top priority in future development. Nurses must be willing to develop their knowledge and change according to the demands of society and become professional nurses. Development in various aspects of nursing is interconnected, interdependent, influencing and having mutual interest. Therefore, innovations in nursing education, nursing practice, nursing science and professional life are the main focus of Indonesian nursing in the professional process. The professionalization process is a process of recognizing something that is

felt, assessed and accepted spontaneously by the community, so it is required to develop itself in the health service system. Because of the reasons above, nursing services must be managed professionally, therefore it is necessary to have Nursing Management.[2]

Management is a dynamic and proactive approach in carrying out an organizational activity. Meanwhile, nursing management is the process of working through members of the nursing staff to provide professional nursing care. The nursing management process is in line with the nursing process as a method of implementing nursing care professionally so that it is hoped that both of them will support each other. As happens in the nursing process, nursing management also consists of data collection, problem identification, planning, implementation and evaluation of results. Because nursing management is specific to the majority of an employee, each stage in the management process is more complicated than the nursing process. Nursing management must be applicable in real service settings in the hospital so that nurses need to understand how the concept and application are in the nursing organization itself.[3]

From the results of observations carried out for one week, starting from November 24 to December 1, it was found that in 1 month there were 20 patients with blood transfusions, 9 patients had complete informed consent, while 11 patients had no informed consent. From the results of the interview with the Head of Team, it was found that, for information, the information had been given to the patient orally, but often forgot to write down the patient's medical record, because there were too many actions to be done while the nursing staff was limited. This can be seen from the records of the patient's status with the action of giving blood transfusions where there was no agreement sheet for giving blood transfusions as much as 55%. From this, students concluded that the patient's completeness of informed consent was incomplete, this could reduce the quality of the hospital.

METHODS

This study has used a descriptive study design. The variable that has been researched in this case study is the documentation of informed consent by the nurse. The approach that has been used in this study is a case study.

The subject of this case study is a nurse who performs blood transfusion therapy for patients. The subject of this study was taken using the total sampling method. This study was conducted in the Baitussalam room of the Sultan Agung Islamic Hospital, Semarang.

Measurement of study variables that have been carried out are: observation, interviews, and study documentation. observations have been carried out on nurses who are carrying out blood transfusions to patients. interviews have been conducted directly to the nurse after completing the action. Documentation studies were carried out by looking at the patient's medical record documents.

All study subjects have expressed their consent and have signed a consent form to be the subject of this study. the researcher did not include the identity of the study subject. Researchers guarantee that the data that has been collected will not affect the work performance assessment of the subject of this study.

RESULTS

The results of the study have shown that there are 4 out of 8 implementation of the nursing management function. some of these problems include:

1. Informed consent for blood transfusion was not included in the patient's medical record.

2. Supervision of the completeness of patient medical records is not optimal, especially in monitoring the completeness of blood transfusion informed consent documents.
3. The number of nurses is still limited
4. There are still many nurses who have a nursing diploma level.

Based on these problems, it can be concluded that the problem has been prioritized, namely: not optimal monitoring of the completeness of patient medical records.

researchers have formulated actions to solve these problems. action taken is to conduct socialization and re-education to nursing supervisors at the hospital.

This activity was carried out in December 2020. Socialization actions were carried out virtually through virtual meetings. This activity was attended by room leaders and team leaders for the Baitussalam room nurse, Sultan Agung Islamic Hospital, Semarang.

The results of the evaluation of the success of these actions indicated that there had been an increase in documentation of informed consent on blood transfusion actions by nurses by 25%. This shows that it is necessary to re-educate the completeness of patient medical records, especially blood transfusion informed consent.

DISCUSSION

Based on the results of the study that was carried out in the Baitussalam 2 Room, there were problems in nursing management, that the evaluation of filling in informed consent in the provision of blood for transfusions was not optimal. informed consent is consent that is given to the patient on the actions to be carried out by doctors and nurses after getting a full description. The implementation of informed consent begins with the doctor planning what actions to give to the patient

to what risks the patient will experience. From a legal point of view, documents that are not filled in completely will be weak as evidence, this was expressed by patient in Completeness of Filling Informed Consent Documents.[4] This is as stated in the results of research by Sisca Adina Purnama, namely documents that are not filled in yet cannot fulfil legal aspects and are weak in physical evidence.[5]

Informed consent is also very much needed by patients because patients have the right in their medical information and actions to be taken against them so that it will support decision-making and can build a trusting relationship, this is in line with research conducted by Gong N. In Gong N's research, states that from the patient's point of view, informed consent that is not conveyed to them is an obstacle to decision making for actions to be carried out on them.[6] In the research, N. Bowers revealed that a very good and regular explanation during the informed consent process can increase the patient's understanding of the procedure to be performed so that it will be beneficial to the patient and the procedure carried out will run well.[7]

Re-education on informed consent and form filling informed consent was implemented on December 10, 2020, through internet meeting, which was attended by 37 participants, and running smoothly. During the meeting, the participants were very enthusiastic. On 11 December in the conduct interviews with the staff back Baitussalam room 2 on informed consent that is the result: staff room Baitussalam 2 has been explained by either concerning the action of platelets along with the risks that would be received by the patient. After the interview with the staff, the students checked the patients who needed blood transfusions, with the results: the patient's family and the patient had understood well the explanation given by the nurse and had signed the informed consent form for giving blood for transfusions. In cases that are not

well documented, it is because at the time of giving the education they are in the patient's ward, while the patient's medical records are in the nurse station so that the signing is often forgotten. In other cases, the family members described were different from the family members who were present at the time of the blood transfusion.

Yawi Sasmita Hasibuan's research on the factors that cause incompleteness of filling in informed consent in hospitals, namely: the knowledge of nurses about actions or procedures to be carried out on patients, nurses with good knowledge, so the informed consent is filled in completely [8]. In another study conducted by Susanto Primananda Dewangga et al, also mentioned that the factors affecting informed consent of patients are medical information that was conveyed to the patient is not complete, so that patients do not understand what is meant by good.[9] Nurses play an important role in filling out the informed consent because the one who interacts most with patients is the nurse. For that, a nurse is required to have good knowledge of the procedures and actions that will be given to patients.

A nurse is required to be creative and innovative in taking action and providing education to patients. As did N. Bowers. In his journal, providing educational procedures to be carried out to patients in the form of multimedia, namely videos. In their research, it was found that 62% of all respondents understood better all procedures than those that were only explained orally.[7] Barriers to completing informed consent are time, knowledge and coordination between management systems in hospitals or inpatient rooms, this was expressed by Sisca Adina Purnama and Sary in a Legal Perspective: Completeness of Filling in the Informed Consent Form in the Inpatient Room.[5]

PDSA implementation of monitoring completeness informed consent administer blood transfusions in Baitussalam Space 2, as follows:

1. Data analysis of monitoring implementation: Not optimal evaluation regarding informed consent for giving blood for transfusion

2. PDSA

Table 1
Planning of action

Indicators	Detail
Plan	a. Re-education on informed consent b. Socialization back on charging informed consent
Do	a. Implementation of seminars on informed consent b. Evaluation of filling in the informed consent of blood transfusion
Study	a. The staff has a good understanding of informed consent b. The staff understands the importance of documenting informed consent
Action	Evaluated the filling of informed consent for giving blood in the Baitussalam room 2

The problems that were found during the implementation of the nursing management application in the Baitussalam 2 Room apart from the inadequate evaluation of informed consent for giving blood for transfusions, namely: Lack of need for nursing personnel. Implementation: discuss with the head of the room to optimize the existing nursing staff. Evaluation: the existing nursing staff can be well optimized.

Conformity theory: good leadership and good communication will make staff feel more motivated and feel happy to make suggestions for service improvement.[10]

CONCLUSION

The management problem that arose in the Baitussalam Room RSI Sultan Agung Semarang was the incompleteness of

documenting informed consent for giving transfused blood. The staff has explained it well and has been understood by the family and patient, but the documentation is still incomplete.

After re-educating the informed consent and filling in the informed consent form for giving blood for transfusions, the medical records of patients who need blood transfusions have been filled. From 55% of patients' medical records, there was a significant increase, namely as many as 80% of patients who required complete blood transfusion. This is not apart from the monitor headspace in the completeness of informed consent administer blood transfusions. Apart from that, optimizing the nursing staff has gone well.

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CONFLICTS OF INTEREST

Neither of the authors has any conflicts of interest that would bias the findings presented here.

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