Effects of Compression Stockings on the Risk of Obstructive Sleep Apnea (OSA) in Hemodialysis Patients

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ABSTRACT

Background: Obstructive Sleep Apnea (OSA) in hemodialysis patients is a sleep disorder that involves stopping or decreasing airflow to breathe during sleep due to excess fluid in the leg. Compression Stockings (CSs) with 30-40 mmHg are high-pressure elastic stockings that are assumed to reduce foot fluid accumulation during the day and to prevent overnight fluid shifting to the neck.
Purpose: The study aimed to determine the effects of 30-40 mmHg CSs on the risk of OSA in hemodialysis patients.
Method: This study used a pre-posttest quasi-experimental design with a control group. Purposive sampling was applied to recruit 68 hemodialysis patients to participate in the study. The risk score of OSA was measured using the STOP-Bang questionnaire. High-pressure CSs were given for one week to the intervention group with two OSA measurements on the 4th and 7th days. The data then were analyzed using the Post Hoc Wilcoxon test and the Mann Whitney test.
Results: There was a significant difference between the risk score for OSA before and after the use of 30-40 mmHg CSs in the intervention group on day 4 ($p=0.000$), and day 7 ($p=0.000$), compared to the control group.
Conclusion: High-pressure CSs decreased the risk of OSA in hemodialysis patients by avoiding fluid retention in the legs, thus preventing fluid shifting to the neck. CSs could be recommended as an alternative to prevent the risk of OSA in hemodialysis patients.

Keywords: Compression stockings; fluid shift; hemodialysis; obstructive sleep apnea

BACKGROUND

One of the efforts to treat Chronic Kidney Disease (CKD), especially for patients with stage 5 or Terminal Kidney Failure (TKF), is through Kidney Replacement Therapy (KRT). Hemodialysis is a replacement therapy for kidney function that uses a special

device to remove toxic uremic and regulate the body's electrolyte fluid (Ministry of Health Republic of Indonesia, 2013). According to the Indonesian Renal Registry (IRR) (2018), the prevalence of TKF accounts for 92% of all renal failure patients undergoing hemodialysis therapy. In 2018, the total of hemodialysis patients had doubled compared to 2017 which was 66,433 (IRR, 2018).

One of the most frequent complications in hemodialysis patients is sleep disorders, with an average prevalence of 50-80%. OSA is one of the sleep problems in dialysis patients. OSA is a chronic condition due to narrowing of the upper airway that occurs repeatedly during sleep and results in collapse, recurrent nocturnal asphyxia, fragmented sleep, fluctuations in blood pressure, rapid heart rate, and increased sympathetic activities due to poor sleep quality (Ogna et al., 2015). The prevalence of sleep apnea in CKD patients occurs 10 times higher than that in the general population (Abuyassin, Sharma, Ayas, & Laher, 2015). This is supported by the research of Wali et al. (2015) in Saudi Arabia which report that sleep disorders in TKF patients who experience OSA are about 10 times.

OSA in TKF patients results from excess fluid caused by an overnight rostral fluid shift. During the day, liquids tend to accumulate in the legs due to gravity in an upright position or sitting. When lying supine at night, water redistributes to the upper part of the body including soft neck tissue so that it narrows the upper airways, which increases the risk of OSA (Silva, Santos, Drager, Coelho, & Elias, 2017). Increased fluid in the neck can narrow the upper airway by enhancing the pressure of extracellular tissue directly and capillary hydrostatic pressure. This increasing pressure facilitates fluid movement from intravascular to interstitial space, which can cause an enlargement of the upper airway mucosa (Redolfi et al., 2011a). As a result of the enlarged upper airway, there is a reduction in recurrent oxygen saturation creating increased oxidative stress and stimulating the sympathetic system that causes hypertension and increased cardiovascular risk.

OSA is often undiagnosed because OSA usually cannot be detected in routine patient examinations (Budiarsa, 2016). Most people who have experienced OSA do not realize or even ignore it because it only occurs during sleep and is considered a trivial or harmless thing. However, Kerns et al. (2018) report that OSA is a significant risk factor for mortality in dialysis patients. Therefore, diagnosing OSA is important in the management of hemodialysis patients with a high risk of cardiovascular morbidity and mortality as OSA is a treatable condition. Optimizing therapy to overcome OSA problems can improve the patients' sleep quality. On the other hand, untreated OSA can contribute to cardiovascular mobility and mortality resulting in decreased patients' quality of life (dos Reis Santos et al., 2013).

Alternative interventions can be given to overcome OSA in patients with excess fluid, namely Compression Stockings (CSs). These interventions have been carried out in some developed countries. CSs are elastic socks that are widely used for the treatment of varicose veins and edema. Based on the research of Silva et al. (2017), CSs prevent the movement of fluid into the lower limbs and also from the intracellular to the extracellular space of the torso. Therefore, the upward pressure given by CSs partially

counteracts gravitational forces, avoiding swelling of the legs, and maintains more fluid in the intracellular space which tends to move freely to other areas of the body. As a result, there is a reduction in the amount of fluid reaching the neck, which partially prevents the buildup of edema in the upper airway at night.

Based on several existing OSA studies, the CSs used is a medium pressure of 20-30 mmHg (Redolfi, Arnulf, Pottier, Bradley, & Similowski, 2011b; Redolfi et al., 2011a; Silva et al., 2017; White, Lyons, Yadollahi, Ryan, & Bradley, 2015) whereas according to Nelson & Bell-Syer (2012), high-pressure CSs of 30-40 mmHg is more effective than low and medium pressure compression. The use of CSs pressure of 30-40 mmHg can significantly reduce the symptoms of lower limb pain, edema, activity intolerance, and sleep disorders (Özdemir, Sevim, Duygu, Tuğral, & Bakar, 2016). This is supported by the International Society of Lymphology (2013) claiming that the gradual use of CS, especially using high pressure, can increase extremity oxygenation. The OSA research in hemodialysis patients has never been extensively conducted in Indonesia using compression stockings of 30-40 mmHg. Therefore, a study to investigate whether 30-40 mmHg CSs reduce the risk of OSA needs to be carried out.

PURPOSE
This research aimed to determine the effects of compression stockings of 30-40 mmHg on the risk of Obstructive Sleep Apnea (OSA) in hemodialysis patients.

METHODS
Design and samples
This study was quantitative research using a pretest-posttest quasi-experimental design with a control group. The researchers used a purposive sampling method to recruit the samples who met the inclusion and exclusion criteria. The inclusion criteria were the patients undergoing hemodialysis twice a week for more than 3 months, aged >25 years old, composmentis, at intermediate risk, and have high risk of OSA based on the STOP-Bang questionnaire, and hypertension. On the other hand, the exclusion criteria were the patients with neurological, musculoskeletal, and upper respiratory tract disorders, totally assisted daily activities, and had current history of smoking or alcohol abuse, wounds, or foot skin infections. The respondents were then divided with equally same number to the intervention and control groups. The respondent's flow chart is shown in Figure 1.

Intervention
The measurement (pre-test) was carried out on the first day of the study by filling out the STOP-Bang questionnaire sheet. In the intervention group, the researchers explained the procedure for using and releasing knee-high CSs and asking the respondents or respondents' families to carry out the procedure that was modeled by the researchers. On the other hand, the control group respondents used knee-high socks (Figure 1). Researchers and respondents agreed to use CSs every day after waking up in the morning and being released while sleeping at night with minimum use of 9 hours/day for one week. The CSs could be released during bathing, ablution, and prayers, and reused after the activities were done. The researchers contacted the respondents or respondents' families to validate the use of CSs by telephone and checklist, the starting and ending time for using CSs, and the total use of CSs every day. Re-measurement

(post-test) was carried out 2 times according to the respondents' hemodialysis schedule, on the 4th day and 7th day of the use by filling out the STOP-Bang questionnaire.
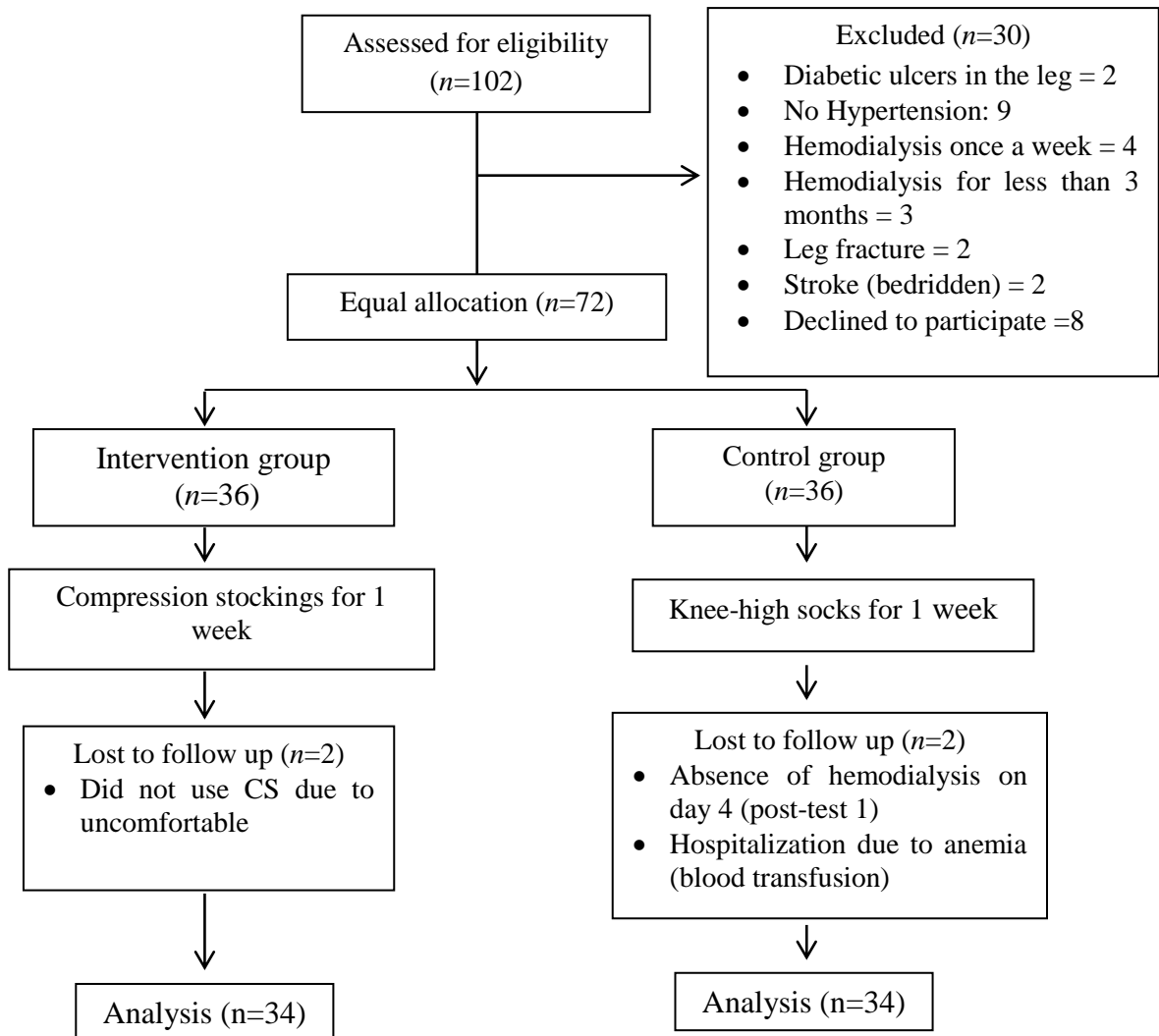
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┌─────────────────────────┐          ┌──────────────────────────────────┐
│ Assessed for eligibility│          │        Excluded (n=30)           │
│        (n=102)          │          │  • Diabetic ulcers in the leg = 2│
└─────────────────────────┘          │  • No Hypertension: 9            │
            │                        │  • Hemodialysis once a week = 4  │
            │          ──────────────▶ • Hemodialysis for less than 3   │
            │                        │    months = 3                    │
            │                        │  • Leg fracture = 2              │
┌─────────────────────────┐          │  • Stroke (bedridden) = 2        │
│ Equal allocation (n=72) │          │  • Declined to participate =8    │
└─────────────────────────┘          └──────────────────────────────────┘
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Figure 1. Respondents' flow chart

Intervention group (n=36) → Compression stockings for 1 week → Lost to follow up (n=2) • Did not use CS due to uncomfortable → Analysis (n=34)

Control group (n=36) → Knee-high socks for 1 week → Lost to follow up (n=2) • Absence of hemodialysis on day 4 (post-test 1) • Hospitalization due to anemia (blood transfusion) → Analysis (n=34)

Measurements

The measuring instrument used in this research was the STOP-Bang Questionnaire (SBQ), which is a simple and effective questionnaire, has moderate performance in diagnosing OSA, and has been widely used due to high sensitivity compared to other OSA questionnaires. The STOP-Bang questionnaire was published in 2008, consisted of eight conceptual questions based on the Berlin questionnaire published in 1999. The conceptual questions were developed based on the symptoms and clinical characteristics of OSA including snoring, tiredness, observed apnea, blood pressure, body mass index (BMI), age, neck circumference, and gender (Chung et al., 2008). The risks of OSA were divided into three categories, namely low risk, intermediate risk, and high risk.

The STOP-Bang questionnaire had been tested for validity *(r=0.876)* and reliability (Cronbach alpha of 0.962) (Anwar, Tursina & Rosadi, 2017). This study also used Compression Stocking (CSs) with the brand of VARITEKS ® type 902 with a length below the knee for all sexes, type class III: 30-40 mmHg.

Data analysis
The Friedman test was used to analyze the mean difference before and after the intervention and continued with the post hoc Wilcoxon test to see the development of OSA risk on days 4 and 7. The Mann Whitney test was also used to compare the mean differences between the intervention and the control groups.

Ethical considerations
This research was conducted in a public hospital in Jambi from April 1, 2019 to April 20, 2019. The researchers explained the objectives, benefits, and research procedures to the patients undergoing hemodialysis. Respondents who showed willingness to involve were requested to complete the informed consent sheets. Respecting the privacy and confidentiality of respondents, providing fair training, benefits, and avoiding dangerous actions were ensured during the study. This research was reviewed and approved by the Health Research Ethics Commission of the Faculty of Medicine, Universitas Padjadjaran with the number 349/UN6.KEP/EC/2019.

RESULTS
Characteristics of respondents
The results showed that the characteristics of respondents in both groups had the same level of variation (homogeneous). Respondents in the intervention and control group were the majority aged 36 to 55 years old. However, more women (61.8%) were involved in the intervention group compared to the control group which was dominated by men (58.8%). In addition, most respondents in both groups had neck circumference < 40 and a BMI of 18.5 – 22.9 (Table 1).

Table 1. Characteristics of respondents (n=68)

Respondents' Characteristics	Group				*p*
	Intervention (*n*=34)		Control (*n*=34)		
	f	%	*f*	%	
Age					
26 - 35 years	6	17.6	1	2.9	0.121**
36 - 45 years	11	32.4	9	26.5	
46 - 55 years	8	23.5	12	35.3	
56 - 65 years	7	20.6	8	23.5	
>65 years	2	5.9	4	11.8	
Gender					
Male	13	38.2	20	58.8	0.089*
Female	21	61.8	14	41.2	
Neck Circumference					
< 40 cm	24	70.6	28	82.4	0.253*
> 40 cm	10	29.4	6	17.6	

Respondents' Characteristics	Group				p
	Intervention (*n*=34)		Control (*n*=34)		
	f	%	*f*	%	
Body Mass Index (BMI)	6	17.65	4	11.8	0.587**
BMI < 18.5	13	38.23	16	47.1	
BMI 18.5 – 22.9	8	23.53	3	8.8	
BMI 23 – 24.9	7	20.59	10	29.4	
BMI 25 – 29.9	0	0	1	2.9	
BMI = 30					

* Chi-Square Test; ** Mann-Whitney Test

Risk of Obstructive Sleep Apnea (OSA)
The results showed that there was no difference in the OSA risk before the intervention (pre-test) between the intervention and control groups (*p*=0.215), indicating that the baselines of OSA risk score in the two groups were the same (Table 2). There was a higher decrease in the frequency of OSA risk on the 4th (post-test 1) and 7th (post-test 2) days after the intervention compared to the control group. After the intervention, most respondents in the intervention group had a decreased risk of OSA (8.8%), while the control group had an increased risk of OSA (61.8) (Table 2).

Table 2. Risks of Obstructive Sleep Apnea (OSA)

	Pretest *f* (%)			Post-test 1 *f* (%)			Post-test 2 *f* (%)		
	Intervention	Control	p	Intervention	Control	p	Intervention	Control	p
High Risk	11(32.4)	16 (47.1)	0.215	6 (17.6)	18 (52.9)	0.000	2 (8.8)	21 (61.8)	0.000
Intermediate	23(67.6)	18 (52.9)		19 (55.9)	16 (47.1)		18 (52.9)	13 (38.2)	
Low Risk	-	-		9 (26.5)	-		14 (41.2)	-	

Differences in the mean of risk score of Obstructive Sleep Apnea OSA
The results showed that there were significant differences in the mean of the risk score in the intervention group on day 4 (*p*=0.000) and day 7 (*p*=0.003) compared to the control group (*p*=0.157 and *p*=0.83, respectively).

Tabel 3. Differences in the mean of risk score of Obstructive Sleep Apnea (OSA)

	Intervention (*n*=34)			Control (*n*=34)		
	Mean Rank (Negative)	Sum of Rank	p	Mean Rank (Positive)	Sum of Rank	p
Pre-test - Post-test 1	7.50	105.00	0.000	1.50	3.00	0.157[a]
Pre test - Post test 2	11.50	253.00	0.000	3.00	15.00	0.025
Post test 1 - Post test 2	5.00	45.00	0.003	2.00	6.00	0.83[a]

Post Hoc Wilcoxon Test, [a] insignificant difference

Mean differences in the risk score of Obstructive Sleep Apnea (OSA)
The results showed a significant difference in the OSA risk on day 4 and day 7 between the intervention group (*p*=0.000) and the control group (*p*=0.000). The intervention group showed a decreased mean of OSA risk higher than the control group. This meant

that the intervention group had a tendency to decrease OSA risk greater than the control group.

Table 4. Mean differences in the risk score of Obstructive Sleep Apnea (OSA)

	Group	*n*	Mean Rank	Sum of Rank	*p*
Pretest	Intervention	34	32.00	1088.00	0.219[a]
	Control	34	37.00	1258.00	
Post-test 1	Intervention	34	26.38	897.00	0.000
	Control	34	42.62	1449.00	
Post-test 2	Intervention	34	22.32	759.00	0.000
	Control	34	46.68	1587.00	

Mann-Whitney Test [a] insignificant differences

DISCUSSION
Based on the results of this study, it can be seen that the use of compression stockings (CSs) for a week reduced the risk of OSA in the intervention group compared to the control group, as reported in previous research. Silva et al. (2017) stated that the use of CSs for 1 week is significant in reducing OSA in oliguric/anuric patients in HD patients and can reduce Apnea-Hypopnea Index (AHI) by 19% with a 4% reduction in the amount of fluid shifting out of the legs overnight. Meanwhile, White et al. (2015) reported that the use of compression stockings for 2 weeks reduced AHI by 25% with a 15% reduction in the amount of fluid that shifted out of the legs overnight. Therefore, it can be concluded that the longer the use of compression stockings, the greater the reduction of OSA risk and the amount of fluid transfer in the legs during the day.

Obstructive Sleep Apnea (OSA) in the patients with excess fluid ranged from moderate to severe OSA risk and accompanied by a significant increase in the amount of fluid in the legs during the day which shifts at night to the neck. This mechanism provides further evidence that overnight rostral fluid shift is one of the factors that contribute to the pathogenesis of OSA in patients with excess fluid (White et al. 2015). In hemodialysis patients, excess fluid contributes to pharyngeal narrowing by vascular distension and/ or due to interstitial edema in the pharyngeal wall or parapharyngeal tissue (Elias et al., 2012). Based on the research of Elias et al. (2012), using magnetic resonance imaging (MRI), OSA severity is correlated with the volume of the jugular vein and the amount of mucous water content around the upper airway in hemodialysis patients. The correlation indicates an important role for excess fluid in the pathogenesis OSA in this population. During the day, while in an upright and sitting position, fluid tends to accumulate in the legs due to gravity. When lying supine at night, water redistributes to the upper body including soft neck tissue, narrows the upper airways, and increases the risk of OSA (Ogna et al., 2015). When moving to the supine position at bedtime, the interstitial fluid that accumulates in the legs is absorbed back into the intravascular compartment and distributed back to the upper body concerning the gravitational force. Some of the fluid that moves from the legs through the stomach is distributed back to the neck at night (Friedman, Bradley, Ruttanaumpawan, & Logan, 2010; Yumino et al., 2010). The fluid can increase the pressure of the peripharyngeal

tissue and narrow the upper airways, causing patients to stop breathing during sleep. Beecroft, Pierratos, & Hanly (2009) also found that excess fluid which is commonly observed in patients with Terminal Kidney Failure (TKF) plays an important role in OSA. As a result, edema is formed in the upper airway and narrows the pharynx.

In the control group, it can be seen that there was an increased risk of OSA on day 7 because the excess fluid in hemodialysis patients contributes to pharyngeal constriction (Elias et al., 2012). Ogna et al. (2015), by comparing pre and post hemodialysis using Polysomnography (PSGs), found a significant correlation between fluid overload volume changes after hemodialysis and OSA severity changes. This shows the significant role of fluid shift and excess fluid, due to the changes in metabolic parameters during hemodialyses, such as pH, BUN, and bicarbonate. When an individual moves from a lying position to a standing position, and increased extracellular volume and a decreased intracellular water occur (Gibson, Beam, Alencar, Zuhl, and Mermier., 2015). Therefore, hydrostatic pressure in the lower limbs goes up. Capillary pressure in the legs when standing (90-120 cmH2O) exceeds the pressure needed to move fluid into the interstitial compartment (15-20 cmH2O) facilitating intravascular volume to decrease 300-400 ml. Consequently, fluid shifts from the intravascular and intracellular spaces to the extracellular volume of the lower limb (Silva et al., 2017). In contrast, a lot of fluid is in the intravascular space when using CSs so fluid shifting to the neck at night will be reduced

Compression Stockings (CSs) are a widely used treatment for varicose veins and edema by applying pressure to the legs and reducing fluid movement from intravascular to the interstitial space by preventing capillary hydrostatic pressure (White et al., 2015). Avoiding the accumulation of fluid in the legs during the day using compression stockings can prevent fluid shifts overnight because compression provided by CSs increases intravascular pressure, thereby reducing capillary fluid filtration in the legs (Partsch, Flour, Smith, & International Compression Club, 2008). This research used a pressure of 30-40 mmHg as CSs of 30-40 mmHg are more effective than low and medium pressure CSs (Nelson & Bell-Syer, 2012). The claim is supported by Lim & Davies (2014) using infrared spectroscopy to monitor the changes in tissue oxyhemoglobin and deoxyhemoglobin. The research reports that oxygenation of the extremities increases with the use of gradual CS especially using high pressure. Therefore, using 30-40 mmHg CSs is expected to reduce the risk of OSA in addition to improving blood circulation in hemodialysis patients. CSs prevent the movement of fluid from the stem to the lower limbs and also from the intracellular to the extracellular space of the torso. The upward pressure exerted by CS partially counteracts gravitational forces avoiding swelling of the legs and maintains more fluid in the intracellular space, which tends to move freely to other areas of the body. As a result, there is a reduction in the amount of fluid reaching the neck, preventing a buildup of edema in the upper airway at night (Silva et al., 2017).

The result also showed that using compression stockings for one week reduces the risk of OSA. This may be due to a decrease in fluid accumulation in the leg. Redolfi et al. (2011a) reported that there is a reduction on the daytime fluid accumulation in the legs by 300 ml, overnight rostral fluid transfer by 308 ml (60%), and overnight changes in

neck circumference by 0.7 cm with a 36% reduction on AHI of non-obese subjects after using CSs for 7 days compared to the control group. Silva et al. (2017) also stated that there was a decrease in fluid volume of 150 ml after using CSs and reducing Total Body Water (TBW) by 600 ml despite the same body weight between groups. This causes little fluid to be available to move rostral, and reduce the increase in NC. Furthermore, CSs can avoid translocation of fluid from the stem to the legs during the day which increases diurnal diuresis thereby reducing TBW.

Although the proportion of sex between the intervention and control groups in this study was quite different, the male and female have the same risk of developing OSA (Windi, Yonathan, Theresia, & Finny, 2018). Research by Feng & Chen, (2009) states that OSA patients are male and female with the same odds ratio for OSA. It is also supported by Tori, Suryawati, & Husni, (2018). They reported that gender differences do not affect the degree of OSA. In conclusion, the gender proportion in the intervention and control groups did not affect the results.

This study has limitations. During the study, the sleeping position of patients while sleeping at home could not be controlled. Some factors affecting the incidence of OSA such as the degree of excess fluid in each patient, dry weight, and patient albumin were also not controlled.

CONCLUSION
This study concluded that there were effects of 30-40 mmHg CSs on the risk score of Obstructive Sleep Apnea (OSA) in hemodialysis patients. This research recommends CSs as a safe and simple intervention to prevent risks of OSA in hemodialysis patients. Further research on the effects of CSs is recommended by modifying the interventions, adding variables, comparing CSs pressure, and utilizing a larger sample size.

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CONFLICT OF INTEREST
No conflicts of interest in this study were declared by the authors.

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Peer Conformity Affects Smoking Behavior among Male Adolescents in a High School in Padang, Indonesia

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ABSTRACT

Background: Peers contribute to the development of adolescents' behavior during the transition period. Adolescents often justify their behavior with peers to confirm social norms of their surroundings. The increasing number of male adolescent smokers is raising public awareness to become acquainted with the cause of the behavior. Peer conformity is expected to be one of the vital variables to circulate smoking behavior.

Purpose: This study aimed to determine the correlation between peer conformity and smoking behavior among male adolescents in a high school in Padang, Indonesia.

Methods: A descriptive-analytical research design with a cross-sectional approach was used in this study. The samples were 154 male adolescents recruited by proportional random sampling. The data were collected using the questionnaires and analyzed using the Fisher exact test.

Results: The results showed a significant correlation between peer conformity and smoking behavior among male adolescents (p=0.000). Peer conformity contributed to the development of smoking behavior among adolescents in this study.

Conclusion: Peer conformity was evident to have a significant correlation with smoking behavior among male adolescents. Increasing assertiveness and life skill ability might be a necessity to adapt to negative behavior among adolescents.

Keywords: Adolescents; peer conformity; smoking behavior; peer relationship

BACKGROUND

Cigarettes and smoking behavior remain to be unsolved problems of the nation among developing countries (World Health Organization, 2019). The tobacco industries are targeting developing countries as profitable resources to increase their company revenue (Word Health Organization, 2013). The exposure of rapidly growing tobacco industry and advertisement affect all populations including adolescents. The increase of pro-tobacco exposure among adolescents is prevalent (Agaku, Adisa, Akinyamoju, & Agboola, 2013), and affects easy access of tobacco among adolescents. The sufficient

supply of tobacco is worsened by the availability of social supply in adolescents. A study showed the presence of social supply of tobacco among adolescents particularly coming from friends and siblings (Gendall, Hoek, Marsh, Edwards, & Healey, 2014). Less awareness in tobacco restriction brought adolescents to trouble-free retail access (Institute of Medicine, 2015).

The world is facing a huge number of death caused by tobacco, around 8 million or half of the smokers each year (World Health Organization, 2019). The number of tobacco smokers currently affects nearly 61.4 million people in Indonesia (World Health Organization, 2018), and 19.4% of them are adolescents (World Health Organization, 2015). In Padang, a capital city of West Sumatra Province, Indonesia, nearly 40.1% of smokers are adolescents; this number is fairly high and highlights public attention of the situation (Antara, 2019). Indonesia has certain cultures and social conditions to generate certain behavior in adolescents (Hidayati, Hatthakit, & Isaramalai, 2012). The world is now focused on reducing tobacco globally by implementing the Framework Convention on Tobacco Control among countries to achieve the Sustainability Development Goals of 2030. Monitoring tobacco use and policy prevention are recognized as one of the programs that should have been developed by the countries to manage the increase of newly engaged smokers (World Health Organization, 2019).

Smoking behavior is notably well known to affect individuals engaged in the use of tobacco substance negatively. Adolescent smokers could also promisingly bring other adolescents into various biological, psychological, and social problems. Health effects caused by smoking may include upper lung or respiratory infection, lung immaturity development, reduced maximum lung vital capacity, and lung cancer (Park, 2011). It is not debatable that smoking behavior also increases the development of anxiety in early adulthood (Moylan et al., 2013). Smoking behavior is also interrelated to poor academic performance and socio-economic inequalities of adolescents (Robert et al., 2019). Substance abuse and addiction are also recognized as the gateway of long-term negative impacts among adolescent smokers (Letcher, Greenhalgh, & Winstanley, 2015).

Adolescent smoking status is related to the social influence of adolescents. A previous study showed that there is a significant association between peer smoking behavior and smoking status of adolescents (Kuendig & Jordan, 2014). Adolescents may get along with peers who actively smoke. Peer smokers will influence non-smoking adolescents in terms of their belief and intent to try smoking (Kamimura, Ahmmad, Pye, & Gull, 2018). Adolescents show a set of behavior to adapt to social environment in accordance to achieve social equilibrium with the majority (Zhang, Deng, Yu, Zhao, & Liu, 2016). Theories of conformity recognizes this behavior as the life skill to evaluate available options naively based on the frequency experienced within a social group, without concern the practical or inferential implications (Bernheim & Exley, 2015). This type of development will bring out the situation in adolescent smokers at school as a risk factor for other adolescents who do not smoke. Smoking behavior has the potential to influence an adolescent's decision to smoke. Hence, it is crucial to identify the essential factors related to adolescents' smoking behavior and how peer conformity affects the smoking behavior among adolescents.

PURPOSE
This study aimed to determine the correlation between peer conformity and smoking behavior among male adolescent smokers in a high school in Padang, Indonesia.

METHODS
Design and samples
This study used a descriptive-analytical research design with a cross-sectional approach to describe the correlation between peer conformity and smoking behavior among male adolescents. The samples were 154 male adolescent students who met the study criteria and recruited by using proportional random sampling. The inclusion criteria were adolescent students of grade VII, VIII, and IX, males, being present at the current time of the study, and smoked. The exclusion criteria were students expressing unwillingness to participate in the study, non-smoking students, and having psychological or social impairment. The number of male students from each grade was calculated, and then, the samples were determined by how many students were considered to represent their groups according to the sample distribution. In overall, the numbers of samples from grade VII, VIII, and IX were 38, 66, and 50 students, respectively.

Research instrument and data collection
This study used the peer-conformity and smoking behavior questionnaires in Indonesian language developed by Pratami (2013). The peer conformity questionnaire consists of 35 narrative questions with three dimensions: closeness, consensus, and obedience. The level of conformity is considered high if the score is >105, moderate if the score is between 70-105, and low if the score is <70. The smoking behavior questionnaire consists of 41 narrative questions with four elements: perception of smoking benefits, smoking intensity, smoking identical place, and time of smoking. The smoking behavior is considered high if the score is >123, moderate if the score is between 82-123, and low if the score is <82. The instruments used Likert scales with favorable and unfavorable statements. The validity and reliability of the instruments were tested. The correlation index of the peer conformity questionnaire was 0.365-0.442 and the correlation index of the smoking behavior questionnaire was 0.372-0.467. The data were collected by distributing the questionnaires to the respondents in January 2019. The respondents completed the questionnaires within 15 to 30 minutes.

Data analysis
Univariate analysis was performed to analyze the frequency distribution of peer conformity and smoking behavior among male students. The Fisher exact test was used to determine the correlation between peer conformity and smoking behavior.

Ethical considerations
This study was strictly compiled to the ethical guidelines and considerations during the research activities. Ensuring that there was no harm to all respondents was maintained. The respondents were provided with essential research ethics such as autonomy, beneficence, non-maleficence, confidentiality, and justice. They were also informed of the purpose of the study and signed an informed consent. The study obtained ethical approval from the Research Ethics Committee of the Faculty of Medicine, Universitas Andalas with certification number of 638/KEP/FK/2018.

RESULTS
The results of the study showed the distribution of peer conformity, smoking behavior, and the correlation between peer conformity and smoking behavior in male adolescent smokers in a high school in Padang, Indonesia. The distribution of peer conformity and smoking behavior is presented in Table 1.

Table 1. The frequency distribution of peer conformity and smoking behavior in male adolescent students (n=154)

Levels	Peer Conformity		Smoking Behavior	
	f	%	f	%
High	63	40.9	85	55.2
Moderate	80	51.9	45	29.2
Low	11	7.1	24	15.6
Total	154	100	154	100

Table 1 showed that a majority of adolescent students (51.9%) had a moderate level of peer conformity, and the other 40.9% with high conformity. It can also be inferred that the percentage of adolescent smoking behavior status was dominantly high (55.2%).

The correlation between peer conformity and smoking behavior is presented in Table 2. It can be seen that among 63 male students presenting a high level of peer conformity, there were 48 (76.2%) students with high smoking behavior status, 11 (17.5%) students with moderate smoking behavior status, and 4 students (6.3%) with low smoking behavior status. Among 80 students with moderate peer conformity, 35 (43.8%) students had high smoking behavior status, 33 (41.2%) students had moderate smoking behavior status, and 12 (15.0%) students had low smoking behavior status. On the other hand, 2 (18.2%) students out of 11 students with a low level of peer conformity showed high smoking behavior status. The statistical analysis using the Fisher exact test showed a significant correlation between peer conformity and smoking behavior among male students with $p=0.000$ ($p<0.05$).

Table 2. The correlation between peer conformity and smoking behavior in male adolescent students (n=154)

Peer Conformity	Smoking Behavior						Total		p-value
	High		Moderate		Low				
	f	%	f	%	f	%	f	%	
High	48	76.2	11	17.5	4	6.3	63	100	0.000
Moderate	35	43.8	33	41.2	12	15.0	80	100	
Low	2	18.2	1	9.1	8	72.7	11	100	

DISCUSSION
This study investigated the correlation between peer conformity and smoking behavior among male adolescents in a high school in Padang, Indonesia. The results showed that a majority of students had high and moderate levels of peer-conformity, amounted to 40.9% and 51.9%, respectively. This research highlighted the level of peer conformity among

adolescents is in the medium category without any less considerable significant number of adolescents in the high category. Most of the moderate and high levels of peer conformity adolescents present the highest number of high smoking behavior status. Conformity in adolescents represents an adaptation of adolescents to the referent group that they follow. Adolescent males tend to have higher conformity than female adolescents (Cakirpaloglu, Lemrova, Kvintova, & Vevodova, 2016). The adolescent needs to confirm their behavior with social norms surrounding them, in order to be accepted and recognized for their presence in the group regardless of the consequences of the behavior or an act. Adolescents with a high level of conformity tend to follow their peers with smoking behavior. Adolescents in a social group will voluntarily follow their peers and peer leaders. Theories also stated that adolescents will determine themselves by following their peer leaders and peer groups to increase their relatedness to each other (Lundberg & Berrett, 2010).

Adolescents have crucial and robust needs to be liked by their surrounding and accepted by friends and larger peer groups. The feeling of acceptance contributes to pleasurable feelings when they experience it. On the contrary, adolescents will experience severe stress and anxiety when they are being excluded and disparaged by their group. Most of the adolescents think it is essential to be seen and to be recognized by the others (Santrock, 2014). The visibility of adolescent social groups in male adolescents also tends to create a negative climate of behavior (Schmidt, Claire, Parrott, & Tharp, 2018). Internal cohesion between peers in the adolescent social network also forms a consensus between members of the group to specific behavior like smoking (Fisher, 2017). Males adolescents will find it hard to ignore and defend themselves not to try and deny peer pressure of smoking. Surrounded by peers who smoke will be associated with adolescent smoking trial experience and smoking continuity (Liu, Zhao, Chen, Falk, & Albarracín, 2017).

This study also confirms that there is a significant correlation between peer conformity and smoking behavior among adolescents. There is evidence showing that peer conformity is interrelated with smoking behavior among adolescents with smoking social peer groups (Seo & Huang, 2012). Another study also examined the relationship between peer conformity and the intention of smoking among adolescents. Smoking adolescents had less self-control to conduct and justify the situations of the social environment (Fauzan, Firman, & Daharnis, 2018). Peer conformity is identical to the closeness of the adolescent with the members of their social peer group. The initiation of smoking in adolescents is positively correlated with peers' smoking if they have interpersonal closeness between adolescents and the member of their social peer group (Liu et al., 2017).

Peer conformity is also marked by their obedience into the member of the group. The desire of adolescents to be in the group makes adolescents try to adjust themselves by always obeying their peers' opinions and behaviors regardless of the consequences of their behavior. Obedience will gain trust from the member of the group. A study showed that peer groups would influence the decision and behavior of the following members both positively and negatively. Participants in a previous study expressed the good, scary, and powerful peer influence at once (Moguel, 2015). The consensus between adolescents makes adolescents absorbing and adjusting opinions without questioning. Adolescents

feel responsible to respect peer opinion to create situation among group remain comfortable either non-conflicted. Smoking behavior presented by adolescents was evaluated in a study, and it was found that if adolescents having smoking friends, there was attraction for them to conduct such same behavior. Having cigarettes offered by friends push the adolescent to conduct smoking behavior. This situation gives adolescent easy access to cigarettes. Friends who provide cigarette supply and delivery are described by adolescents as easy access to cigarettes when they want to smoke because of their friend's supply (Urrutia-pereira, Oliano, Aranda, Mallol, & Solé, 2017).

Adolescence that is identically known as life period of peers considers an important role in making decision. The influence of social circumstance during adolescence sometimes lead the adolescents to risky and maladaptive decisions. It is confirmed risky and maladaptive decisions caused by peer influence to use substances like cigarettes. Three eminent verbal models of social influence of adolescents are reward sensitivity, social motivation, and distraction (Ciranka & Bos, 2019). Peers influence almost all life aspects of adolescents, from the more daily basic needs such as fashion, food, and sports to the more risky behavior such as smoking, use of illegal substances, or engaging in unsafe sexual practice. These bad choices may affect adolescent life-long consequences for adolescent health and put adolescents into a significant impact on their social life (Pfeifer et al., 2013).

On the other hand, friends are one of the most crucial contexts throughout adolescent positive behavior development. If it is appropriately managed and directed, it will prevent some of the personal consequences such as loneliness, well-being, health, and happiness. Friends will help adolescents to promote excellent school achievements and acquiring important social skills for adult life (Tomé, de Matos, Simões, Camacho, & AlvesDiniz, 2012). The use of strategy to involve adolescents in preventing smoking behavior also makes an impact through developing healthy adolescent behavior. A study confirms that antismoking messages between peers affected the less intention of adolescents to try smoking (Harakeh & van Nijnatten, 2016).

CONCLUSION
Peer conformity was evident to have a significant correlation with smoking behavior among adolescents. Assertiveness might be a necessity to adapt to negative norms of behavior among adolescents. It is pivotal to increase the life skill ability of adolescents to build such behavior in directing appropriate behavior. The future study shall compare multifactorial factors of smoking behavior among adolescents and seek modest and adaptable life skills that should be nurtured to adolescents.

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CONFLICT OF INTEREST
None

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Does Tabletop Exercise Enhance Knowledge and Attitude in Preparing Disaster Drills?

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ABSTRACT

Background: Tabletop Exercise (TTE) is a specific learning method through a simulation designed to test the competency and the ability of a group to respond to disasters. Using the map of disaster events is considered effective to prepare disaster drills rather than other methods. TTE method has been carried out annually to train the students, however, limited studies reported the effect of this method.

Purpose: The study aimed to evaluate the effect of TTE on enhancing nursing students' knowledge and attitude in a disaster drill.

Methods: This study was conducted with one-group pre and post-test of a quasi-experimental design. The total samples were 80 nursing students of the fourth year who undertook the disaster nursing course. The intervention of the study was started using the scenario of an earthquake disaster simulation using TTE media divided into four groups. The instruments consisted of two questionnaires: Students' Knowledge on Tabletop Exercise (SKTE), and Students' Attitude on Tabletop Exercise (SATE) which were tested for their validity and reliability. The data were analyzed using a dependent paired t-test.

Results: The study showed that the tabletop exercise had a positive effect in enhancing the knowledge (p=0.001) and the attitude of nursing students in disaster drills (p=0.001) (df=79).

Conclusion: TTE Intervention was an effective direct learning method to improve students' competencies in disaster response. TTE might be considered as a learning method in improving students' competencies in preparing disaster drills.

Keywords: Attitude; disaster; knowledge; nursing student, tabletop exercise

BACKGROUND

Geographically, Indonesia is located in a series of "rings of fire" that stretch along with the Pacific plate which is the most active tectonic plate in the world. This zone contributes about 90% of earthquake events and almost all of them are major earthquakes in the world (National Board for Disaster Management, 2014). Because of this condition, Indonesia has a high risk of recurrent disasters and vulnerability to disasters. The disaster may be caused by either natural or man-made human factors, resulting in devastations such as human impacts: physical,

psychological, psychosocial and spiritual problems; environmental damage; and loss of property (Husna, Kamil, Yahya, & Tahlil, 2020). The impacts also destroy the social life of the community, especially on the physical, emotional, and psychological health (Althobaity, Plummer, & Williams, 2017; Park & Kim, 2017). The occurrence of natural disasters, social conflict, and warfare can significantly cause economic and human life losses. These kinds of disasters are certainly very harmful to society.

However, although various disasters occurred, the disaster management is still having many challenges (Husna, Hatthakit, & Chaowalit, 2011b; Husna, Tahlil, Kamil, & Hayaturrahmi, 2018; Yi, George, Paul, & Lin, 2010). Disaster preparedness should be a priority, especially in the disaster high-risk area, including nursing schools. The training and drill as an effective learning method improve the knowledge and ability of disaster preparedness (Alim, Kawabata, & Nakazawa, 2015). A tabletop exercise is a preparedness exercise to formulate an emergency condition during a disaster by the simulated action to respond to disasters or emergency casualties. The groups or teams learn together in a particular emergency situation and then arrange the emergency plan during the disaster. TTE attempts to clarify the roles and responsibilities of a disaster team and to examine the capability of the mitigation and the preparedness of the drill team. The output of this exercise is an action plan for an emergency situation, where the respective team is given a role (Police University Wisconsin, 2012).

TTE allows the participants to conduct and show in a scenario-based exercise, mitigating and responding to the disaster. TTE provides the team with understanding and experience of specific contingency action plans in disaster simulations. In addition, TTE may train and improve the personnel's capabilities with respect to roles and responsibilities in a disaster drill, and understanding of disaster management. TTE also facilitates an open discussion between the team about an emergency or disaster scenario in a stress-free environment (Watson, Waddell, & McCourt, inpress). The most important thing in disaster preparedness is to prepare the best disaster team through TTE to simulate the experience and the skills in disaster management, so that they could perform effectively in managing chaotic situations during disasters. Effective periodic disaster simulations can assist teamwork and communication to improve prehospital competencies in carrying out effective emergency procedures (Leikin, Aitchison, Pettineo, Kharasch, & Wang, 2011). Moreover, hands-on learning or a drill has a positive impact on the confidence and the knowledge following the instruction in emergency settings or disasters (Bulloch, Pharm, Pinner, Pharm, & Eure, 2013). The disaster drill could lead to improve the disaster response competencies (Araz & Jehn, 2013; Nadian, Nik, Sipon, & Rahim, 2015), and a significant increase in the level of confidence in providing core public health services during the disaster drill (Su et al., 2013).

Because of the vulnerability and the increasing frequency of disasters occurring in the 21st century, it is necessary for the nursing institutions to enhance students' competencies in preparing for disaster. Nursing education must reflect the attainment of nurses' competencies in improving the quality of services, especially in disaster, through the use of various teaching methods (Chee, 2014). Incorporating TTE into the teaching methods is an effort to ensure an adequate response to the disaster. Collaborative learning is obtained through TTE for disaster preparedness or drills (Alfred et al., 2015). Additionally, the training and disaster drills enhance the knowledge and the ability of the nursing students to be well prepared in responding to the disaster (Alim et al., 2015).

TTE is a learning method that is easy and cost-effective. A study mentioned that TTE had a cost-efficient means to train and test public health response to disasters (Sandström, Eriksson, Norlander, Thorstensson, & Cassel, 2014). The advantages of TTE from other disaster simulation methods are cost-effective, easy, applicable, and helping teamwork in accordance with their roles and functions effectively. Although several studies explain a positive effect in increasing knowledge from TTE exercises, limited studies reported a positive effect of TTE on changing student attitudes in preparation for disaster drills. This research study tries to address the currently existing gaps in the literature.

PURPOSE
This study aimed to evaluate the effect of TTE on enhancing nursing students' knowledge and attitude in a disaster drill.

METHODS
Research design and setting
This quasi-experimental study was conducted using one group pre and post-test design in January 2019 in a faculty of nursing of a public university in Banda Aceh, Indonesia.

Participants and sampling
The total sampling was conducted to recruit 80 nursing students as respondents. Respondents were chosen by purposeful selection according to the following inclusion criteria: fourth-year students, aged 19 to 23 years, and currently taking a disaster nursing course. The exclusion criteria were the students who have been involved in the TTE simulation before.

Measurements
The research instruments included two questionnaires. The first questionnaire was the Students' Knowledge on Tabletop Exercise (SKTE), consisting of 23 questions in the dichotomy scale, which included questions about roles, functions, tasks, and responsibilities of each drill team, and constructed based on the previously reported studies. The second questionnaire was the Students' Attitude on Tabletop Exercise (SATE) that consisted of 10 items on Likert scales with 4-point scales "disagree", "uncertain", "agree" and "strongly agree". The validity test was conducted with three experts in order to fix the contents. The feedbacks were rearranged in the right order with several modifications in the contents. Both questionnaires had been tested for their reliability to 20 nursing students with the values of 0.873 and 0.904, respectively. The pre-test of the study was measured before TTE activities, and the post-test was evaluated in a week after the TTE intervention.

Intervention
The intervention of the study was started by using the scenario of an earthquake disaster simulation using TTE media for 80 nursing students, that were divided into four groups. TTE lasted for 90 minutes in the nursing laboratory. The students had been given their respective roles to carry out TTE. To avoid the bias of the study, the students were not provided any materials about TTE before doing the pretest. Prior to TTE simulations, briefings about the roles and functions of team members were conducted. TTE scenario was carried out by determining the roles of each student using the TTE media provided. TTE study was conducted in the second week of full-day learning in the laboratory phase. The students were given roles according to their duties and responsibilities, as follows: (1) incident commander, (2) search

and rescue team, (3) triage team, (4) first aid team, (5) the ambulance team, (6) police and fireman team, (7) disaster victim identification team, and (8) field hospital team.

Data analysis
The pre-test and post-test data were normally distributed. A dependent paired t-test was used to analyze the differences of respective results. The comparison of the average scores included the knowledge and attitudes of nursing students in TTE.

Ethical considerations
This study had been approved by the Research Ethics Committee of the Faculty of Nursing, Universitas Syiah Kuala Banda Aceh, with the number 113006101218 on December 26, 2018. The permission from the faculty where this research was carried out had also been obtained. Approved written consents were collected from the students prior to the pre-test. Respondents understood the research objectives, risks, and benefits, and had the right to refuse. In addition, the confidentiality of the respondents was guaranteed.

RESULTS
Characteristics of respondents
Table 1 showed that the mean age of the respondents was 20.7±0.59 while the majority of the respondents were females (92.5%) and had attended the disaster drill before (95%).

Table 1. Demographic characteristics of respondents (n=80)

Demographic data	Mean±SD	Min	Max	*F*	%
Age (year)	20.7±0.59	19	22		
Sex					
Female				74	92.5
Male				6	7.5
Had attended in the disaster drill					
Yes				76	95
No				4	5

Differences in knowledge and attitude of nursing students
There was a significant increase in the mean scores of knowledge (p=0.001) and attitude (p=0.001) of the nursing students after TTE. However, the students' attitudes had a higher increase compared to the students' knowledge (Table 2).

Table 2. The students' knowledge and attitude in preparing disaster drills (n=80)

	Pre-test	Post-test	*t*	*p*
	M (SD)	*M (SD)*		
Knowledge	40.29 (4.02)	42.55 (3.39)	-4.05	0.001
Attitude	31.53 (3.71)	35.05 (3.35)	-6.23	0.001

Note: *df*=79, t=sample t-test

DISCUSSION
The result of the study showed that the TTE intervention affected positively on the nursing students' knowledge and attitudes in disaster drill preparation. This result is supported by

Watson et al., (inpress) pointing out that tabletop exercise increases understanding of disaster management, roles in a disaster, and identifies strengths and weaknesses of participants who manage the disaster. TTE activities, as a pre-drill preparation, may provide baseline knowledge for the students when conducting disaster management. The advantage of TTE deals with teamwork effectiveness, where the stressful working environment has to be avoided. Tabletop drilling had improved the performance and provided more effective learning opportunities than the field training in disaster or emergency response. Several obstacles in disaster drill training such as communication problems, coordination, responsibilities, and mitigation priorities can be overcome by TTE.

From the result of the study, it could be explained that the understanding of the TTE simulation has changed nursing students' mindset and attitudes to be more prepared and responsive in facing disasters. Compared to the other methods, TTE is superior to support the nursing students to overcome their lack of knowledge, skills, and attitude in the preparedness, mitigation, and disaster responses (Jose & Dufrene, 2014). Furthermore, knowledge and disaster preparedness can be improved through continuous training and disaster drills (Alim et al., 2015). TTE stresses the effectiveness of teamwork which allows the process of obtaining knowledge and determining the right attitude, at each training session, that can be directly applied when carrying out a disaster drill. The simulation-based training such as TTE can be a valuable training modality with the opportunities to exercise and arrange the high-risk events, such as disaster (Gardner et al., 2016). Additionally, it is required to have regular training and education to health workers in disaster response in order to give an adequate clinical knowledge, experience, and skills (Husna, Hatthakit, & Chaowalit, 2011a).

Furthermore, this study showed that the mean score of students' attitudes increases significantly rather than students' knowledge. The real experience of conducting TTE has significantly enhanced students' attitudes. This could be explained that TTE activities have demonstrated to alter attitudes and interpretations of the nursing students in preparing for disaster drills. By conducting TTE, the students obtained the first enthusiastic experience, directly learn actual disaster scenarios, and they were trained in awareness and readiness to disasters. The students also learned cohesiveness and teamwork in carrying out their respective roles. This assumption is supported by Jose and Dufrene (2014), stating that the simulation has been proven to increase confidence in the workplace areas, as well as the ability to handle emergency situations either in hospital or community settings.

TTE, a pre-disaster drill learning method, aims to improve the knowledge and attitude of the nursing students in disaster preparedness and responses. Nurses as leading professionals are required to perform their roles in disasters. In disaster management, nurses have a major role (Zarea, Beiranvand, Sheini-Jaberi, & Nikbakht-Nasrabadi, 2014). However, there has been no special action to plan a nursing protocol to face disasters, resulting in an inefficient performance in handling the disaster survivors. Therefore, the knowledge and attitudes related to disaster responses are important in disaster management, especially for nursing students (Zarea et al., 2014). It is more urgent, especially when it comes to Aceh province, Indonesia, which is very vulnerable and in the high-intensity region of disasters. The 2004 earthquake and tsunami disasters had claimed the loss of many lives, injuries, and other devastations impacted 11 countries (World Health Organization, 2005). The dreadful devastating experience from the

past disaster events should be prevented in the future, and anticipated by all stakeholders, especially through the optimization of disaster nursing curriculum.

Nursing education institutions playing an important role in disaster should well prepare the students for disasters' mitigation, response, recovery, and evaluation phases. It is in accordance with the opinions that nursing education institutions must be able to prepare future nurses to be more effective in responding to all types of disasters through a disaster curriculum (Alfred et al., 2015). Additionally, the curriculum should provide a general and adequate description of the effective and applicable disaster nursing concepts. In the same light, the use of TTE might develop students' clinical competencies and decision making. Disaster simulation allows the students to practice their knowledge and learned materials. The increasing frequency of disasters throughout the world urges the development of innovative disaster learning methods in the education system (Alfred et al., 2015; Curriea, Kourouchea, Gordona, & Jormb, 2018). The Indonesian nurses' education curriculum system claims that the disaster curriculum is integrated into the disaster nursing subject with three credit points (two credits for in-class learning and credit for practical skills) (Haryanti, Kamil, Ibrahim, & Hadi, 2016). By studying this course, the students are expected to understand the concept of disaster, the roles and duties of nurses in each disaster management phase. Furthermore, the implementation of this course in the faculty of nursing was preceded by a comprehensive overview of disaster concepts only before moving to laboratory and tabletop exercise skills.

Educational institutions can utilize TTE to provide learning opportunities for students through an emergency plan trial for disaster response. In TTE, there are roles and responsibilities to identify disaster mitigation and preparedness. The team is given a scenario to play a role in disaster mitigation and response. Engaging students in critical thinking and allowing them to practice in a safe environment is crucial for the education process (Farra, Miller, & Hodgson, 2015). Moreover, school-based disaster management through TTE may effectively reflect disaster management conditions in real emergency situations (Wang, 2016). TTE is considered to be very effective in playing the roles and responsibilities of each team member in disaster management, thus increasing students' ability to respond to disasters. Therefore, students can be more competent in disaster management (Nilsson et al., 2016). Moreover, TTE is a low-cost disaster simulation method but has a high impact on increasing the capacity and competence of health teams for disaster management. This method improves the students' knowledge and attitude towards emergency preparedness and response (Lauren et al., 2018).

The development of knowledge and attitude towards disaster preparedness and response is important to be conducted by educational institutions as a part of the knowledge management system. Knowledge management systems in the disaster emergency management education have become an important priority at this time because the catastrophic events can indiscriminately devastate all humans worldwide (Dorasamy, Murali, & Kaliannan, 2017). TTE is useful in determining the important role of team members in improving the speed and quality of responses in disaster drills. The education and professional experience from disaster response team members can be obtained through TTE. The professional value of the emergency response team in a disaster can be demonstrated from the ability to perform an effective and efficient disaster response (Woodard, Brenda, David, & Colleen, 2010).

Finally, the limited respondents in this study need to be enlarged for the future study. The study also used one group without comparing groups, due to particular reasons such as a limited sample, time, and schedule for TTE simulation that had already been arranged by faculty management. However, in order to minimize the bias, the students involved in this study were assured that they had never received or been involved in any TTE materials or simulations as the exclusion criteria in this study.

CONCLUSION
This finding reported that TTE significantly improved nursing students' knowledge and attitudes in preparing disaster drill. TTE improved the attitude more than the knowledge of the nursing students through the acquisition of real experiences that were attractive and enthusiastic during TTE simulations. Therefore, this learning method could be implemented and developed in educational institutions by integrating it into the disaster nursing curriculum, generating TTE-based disaster drill practices to improve students' competencies. Further studies should also consider to enlarge the sample size and use control groups as a comparison.

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CONFLICT OF INTEREST
The authors declare that no conflicts of interest in the study.

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Effects of Peer Support Program on Self-Management in Patients with End-Stage Renal Disease Undergoing Hemodialysis

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ABSTRACT

Background: Patients with End-Stage Renal Disease (ESRD) undergoing hemodialysis require proper self-management of lifestyle changes to minimize risks of complications, morbidity, and mortality. Efforts made to improve self-management in hemodialysis patients in previous studies were mostly carried out by health workers that may not provide 'real' knowledge, while peer support programs carried out by patients as peers to share their experiences may provide more benefits.

Purpose: The purpose of this study was to determine the effects of peer support programs on improving self-management in patients with ESRD undergoing hemodialysis.

Methods: This study employed a quasi-experimental design and involved a total of 33 patients in the control group and 32 patients in the intervention group, who met the inclusion and exclusion criteria. The samples were recruited consecutively. The intervention of peer support programs was implemented through information support, emotional support, and mutual reciprocity in groups of 10-12 people to share experiences related to their self-management. The intervention was given for six sessions; each lasted for 30-45 minutes. The data were collected using the Indonesian version of the hemodialysis self-management instrument (HDSMI) and analyzed using the paired-sample t-test and independent-sample t-test.

Results: The results showed that after the intervention, the mean score of self-management in the intervention group increased from 79.47±7.919 to 90.75±7.089, and in the control group, the mean increased from 81.88±8.291 to 82.12±7.692. After the implementation of peer support programs, there was a significant difference in the score of self-management between the intervention group and the control group (p<0.001).

Conclusion: Peer support programs gave an effect on increasing self-management in patients with ESRD undergoing hemodialysis. Peer support programs should be introduced early to ESRD patients undergoing hemodialysis so that they can learn about self-management from other patients.

Keywords: End-stage renal disease; hemodialysis; peer support; self-management

BACKGROUND

Kidney failure is recognized as a major health problem that contributes to an increased rate of morbidity and mortality. Global Burden of Disease (GBD) shows that there are 1.2 million people died from kidney failure in 2015, with an increase of 32% since 2005 (Wang et al., 2016). In Indonesia, the data from the basic health research showed that there is an increased prevalence of End-Stage Renal Disease (ESRD) from 0.2% in 2013 to 0.38% in 2018 (Ministry of Health Republic of Indonesia [MoHRI], 2019). Patients with ESRD require therapies to replace decreased kidney function, including hemodialysis (HD), peritoneal dialysis (PD), and kidney transplant (Smeltzer, Bare, Hinkle, & Cheever, 2010).

Hemodialysis is the most widely used kidney replacement therapy for ESRD patients. A majority of patients chose HD (86.9%) over PD (10.1%), and kidney transplant (2.9%) as the modality in the USA (Saran et al., 2019). The number of patients undergoing HD in Indonesia increased dramatically in the last 3 years, recorded as many as 52,835 patients in 2016, 77,892 patients in 2017, and 132,142 patients in 2018 (Indonesian Renal Registry, 2018).

The global mortality rate of hemodialysis patients is 16.9-26.7 (death/100 patients per year) in the first year (Robinson et al., 2014). Cardiovascular disease (CVD) is a highly common complication and becomes the first cause of death in ESRD patients (Cozzolino et al., 2018; Magalhaes et al., 2017). Hemodialysis requires essential lifestyle changes such as consistent attendance at a dialysis unit for treatment, restriction of fluid intake, diet, and taking medications (Li, Jiang, & Lin, 2014). Such lifestyle changes are strongly influenced by increasing self-management.

Self-management is a collaborative activity between patients and health workers that aims to minimize the impact of chronic diseases on health status and function, through managing diseases, making decisions about needed self-care, identifying problems, setting goals, and monitoring and managing symptoms that arise (Rijken, Jones, Dixon, & Anna, 2008; Ryan, 2009). Most of the patients with ESRD undergoing HD (57.4%) in a previous study reported lower self-management levels (Gela & Mengistu, 2018). Efforts to improve self-management in HD patients and maintain the patients' condition to remain optimal are ways to reduce mortality, morbidity and improve the quality of life of patients (Guney et al., 2012; Lin, Liu, Hsu, & Tsai, 2017). Interventions to improve self-management may include education and counseling, self-management programs, self-efficacy training, self-monitoring programs, and social support (Husain, Johan, & Kusuma, 2019).

The self-management of HD patients is influenced by knowledge, self-efficacy, and social support (Li et al., 2014). Research showed that positive social facilitation enhances self-regulation and engagement in self-management behaviors (Ryan, 2009). Health literacy and social support play independent positive roles in the self-management behavior of patients with kidney disease, with social support having a particularly dominant role (Chen et al., 2018). Social support through peer support programs in previous studies was evident to improve adherence to treatment management in chronic conditions (Haidari, Moeini, & Khosravi, 2017; Yin et al., 2015).

In previous studies, peer support programs in HD patients had focused on psychological outcomes (Irajpour, Hashemi, Abazari, Shahidi, & Fayazi, 2018; Malek-Khahi, Milani, & Amiri, 2015), and carried out by health workers (Mahjubian, Bahraminejad, & Kamali, 2018). While health workers may not be able to provide 'real' knowledge that is derived from the real-life experience of HD patients, how it feels, and how self-management is implemented (Taylor, Gutteridge, & Willis, 2016), it is, therefore, important to investigate how peer support affects self-management in HD patients.

PURPOSE
This study aimed to determine the effects of peer support programs on improving self-management in patients with end-stage renal disease (ESRD) undergoing hemodialysis.

METHODS
Research design and samples
This study used a pre-test and post-test quasi-experimental design with a control group. The samples were HD patients in a public hospital in Semarang, Indonesia, recruited by consecutive sampling with a total of 33 patients in the control group and 32 patients in the intervention group. The inclusion criteria were ESRD patients undergoing routine HD twice a week for ≥ 3 months, aged ≥ 18 and ≤ 65 years old, compos mentis, willing to complete a series of peer support programs, not having hearing loss and verbal disorders, graduating from elementary to high school, and being able to read and communicate in the Indonesian language. The exclusion criteria were patients with hospitalization and experienced major depression and dementia. The participants' flowchart in this study is presented in Figure 1.

Measurements
The self-management measurement tool in HD patients was stated in Li et al. (2014), i.e., the HD Self-Management Instrument (HDSMI), consisting of four components, namely partnership, problem-solving, self-care, and emotional management. The researchers used the Indonesian version of the questionnaire as used in a previous study by Astuti (2016). The questionnaire consisted of 32 items and was declared valid and reliable with a validity value of 0.331-0.799 and an alpha Cronbach value of 0.898 (Astuti, 2016). This instrument was used to measure patients' self-management before (pre-test) and after (post-test) the intervention of peer support programs.

Data collection procedure
One week before the intervention, the patients filled out the self-management questionnaire that had been prepared (pre-test). Peer support programs through

informational support, emotional support, and mutual reciprocity were carried out in groups of 10-12 people to share the experiences of self-management for 6 times, 2 times/week, and 30-45 minutes per meeting.
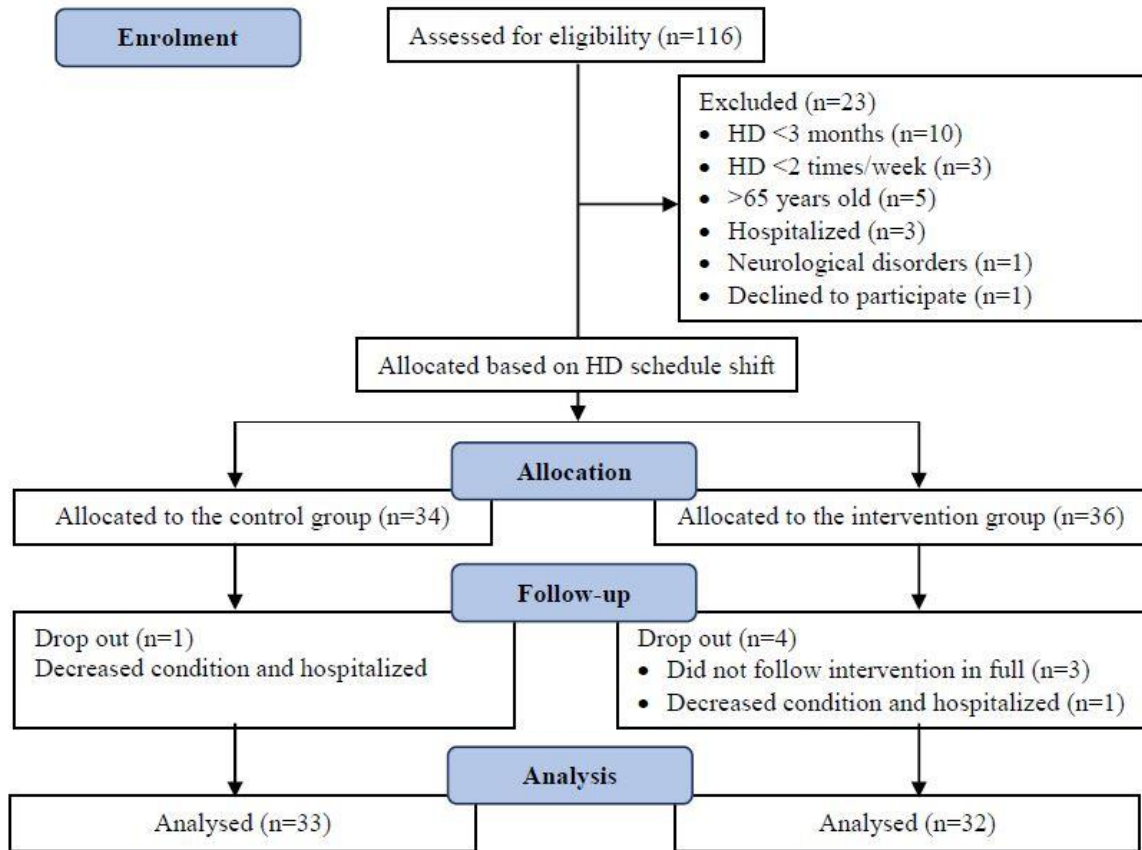

Figure 1. Participants flowchart in the study

The intervention activities are presented in Table 1. One week after the intervention, the patients were measured for self-management using the same questionnaire (post-test). In this study, the patients in the control group were given peer support program manuals books and education about HD self-management after the post-test.

Table 1. Schedule of peer support programs

Session	Activities	Description
Session 1	Formation of group and selection of peer leaders	Patients were grouped based on the same shift schedule. Researchers distributed peer support program manual books and led discussions to explore difficulties regarding self-management in patients. Each group determined the peer leader and planned further discussions. Peer leaders were selected based on group agreement and those who were willing to lead the discussion in the group. Researchers explained the role of the peer leaders.

Session	Activities	Description
Session 2	Fluid restriction management	Peer leaders led the groups to share experiences on non-compliance with fluid restrictions (e.g., swelling, shortness of breath), and on strategies for limiting fluid, how to calculate the maximum fluid consumption, how to manage thirst, and how to monitor interdialytic weight gain (IDWG).
Session 3	Nutrition management	Peer leaders led members to share their experiences of foods that might cause health problems, difficulties in choosing food, and the solutions. Group members also shared experiences of the amount and how to consume fruits and vegetables for HD patients, as well as strategies for choosing foods to be consumed.
Session 4	Treatment management and hemodialysis adequation	Peer leaders asked members whether they had missed any HD schedules (skipping HD), and complaints that they experienced due to such absence. Group members also shared their past experiences of average time needed for completing an HD schedule, reasons for uncompleted HD (accelerated due to complications, e.g., cramps, hypotension). They also advised each other related to the drugs consumed, such as name, use, side effects, and how to meet the adequacy of hemodialysis (arriving on time, on time HD, and limiting weight gain).
Session 5	Emotional management	Peer leaders asked group members whether they often felt angry easily, and things they usually did to express the emotion. Exploration of solutions and tips for managing stress and anger, as well as practicing deep breathing relaxation with group members were also conducted.
Session 6	Evaluation and follow-up plan	Peer leaders and members explored feelings during the activity, advised each other, and determined the sustainability plan of the groups that had been established.

Data analyses

Data on the characteristics of participants such as gender, age, education, occupation, family income, the period of dialysis, and co-morbidities were analyzed using descriptive statistics. The homogeneity of the two groups was tested using the Chi-square test. The data normality on self-management was examined using the Shapiro Wilk test, and the result showed that the data were normally distributed. The paired t-test was used to analyze the mean difference before and after the intervention, while the independent t-test was used to compare the mean differences between the intervention and the control groups in this study.

Ethical considerations

This study was approved by the Health Research Ethics Committee of Tugurejo Hospital Semarang with number 57/KEPK.EC/IV/2019. Informed consent was obtained from all patients. Important information related to the purpose of the study, procedures, risk, and benefits of the study were explained to the patients. The confidentiality of the patients was also maintained throughout the study.

RESULTS
Characteristics of participants

The characteristics of participants in the intervention group and the control groups in this study showed a p-value of >0.05, indicating no statistically significant difference between the two groups. Table 2 shows that the majority of the participants in both groups were males (66.2%), late adults (41-65 years old) (78.5%), graduated from high school (50.8%), unemployed (60%), family income/month <IDR 2,500,000 (58.5%), period of dialysis <1 year (40%), and had 1 co-morbid disease (53.8%).

Table 2. Characteristics of participants in the control and the intervention groups (n=65)

Variable	Groups				p
	Control Group (n=33)		Intervention Group (n=32)		
	f	%	f	%	
Gender					
Male	21	63.6	22	68.8	0.862*
Female	12	36.4	10	31.3	
Age					
Early Adult (18-40 years old)	8	24.2	6	18.8	0.813*
Late Adult (41-65 years old)	25	75.8	26	81.3	
Education					
Elementary School	10	30.3	9	28.1	
Junior High School	7	21.2	6	18.8	0.930*
High School	16	48.5	17	53.1	
Occupation					
Employed	14	42.4	12	37.5	0.879*
Unemployed	19	57.6	20	62.5	
Family Income/Month					
< IDR 2,500,000	18	54.5	20	62.5	0.690*
≥ IDR 2,500,000	15	45.5	12	37.5	
Period of Dialysis					
<1 year	12	36.4	14	43.8	
1-3 years	12	36.4	13	40.6	0.516*
> 3 years	9	27.3	5	15.6	
Co-morbidities					
No co-morbid disease	8	24.2	8	25.0	
1 Co-morbid disease	17	51.5	18	56.3	0.861*
> 1 Co-morbid disease	8	24.2	6	18.8	

*Chi-square test

Effects of Peer Support Program on Self-Management of ESRD Patients

Table 3 shows that after the peer support program, the mean score of self-management in the intervention group increased from 79.47±7.919 to 90.75±7.089, while in the control group, the mean increased from 81.88±8.291 to 82.12±7.692 with a p-value of <0.001. It can be concluded that there was a positive effect of peer support programs on increasing self-management in ESRD patients undergoing hemodialysis.

Table 3. Effects of peer support program on self-management before and after the intervention

Group	Before Intervention Mean±SD	After Intervention Mean±SD	95% CI	P^a
Intervention Group	79.47±7.919	90.75±7.089	(-14.021) - (-8.541)	<0.001
Control Group	81.88±8.291	82.12±7.692	(-2.104) - (-1.619)	0.793
P^b	0.235	<0.001		

[a]Paired-sample t-test, [b]Independent-sample t-test.

DISCUSSION

This study investigated the effects of peer support programs on improving self-management in patients with ESRD undergoing HD. Results showed positive effects of peer support programs on increasing self-management of ESRD patients undergoing hemodialysis ($p<0.001$). These findings are similar to a study previous that peer support with group discussions improved self-management ($p<0.001$) (Mahjubian et al., 2018). Another study also showed that one-to-one peer support (peer mentoring) affected dialysis self-management (Russell et al., 2017).

The success of HD cannot work if it only relies on a health team. The ability of patients' self-management to lifestyle changes such as consistent attendance at a dialysis unit for treatment, restriction of fluid intake, diet, and taking medications, influence the success of HD therapy (Li et al., 2014). Patients will be involved in self-management behaviors that are recommended if they have information and trust in health, self-regulation abilities and if they have social facilitation that positively influences and supports them to engage in preventive health behaviors. So that giving education to patients to improve their ability to control themselves also needs to involve social support in the form of information, emotional and instrumental support (Ryan, 2009; Ryan & Sawin, 2009).

Knowledge, self-efficacy, and social support are factors that influence self-management in HD patients (Gela & Mengistu, 2018; Li et al., 2014). Previous studies show that peer support in group discussion was an effective educational method to promote knowledge that improves the self-management of chronic HD patients (Mahjubian et al., 2018). Sufficient knowledge about the disease and problem-solving abilities are very important in the process of identifying problems, choosing the right solution, and evaluating its effects (Ryan, 2009). Knowledge is considered to foster the ability of self-confidence, self-efficacy, and patient compliance, especially in making decisions to carry out self-management (Hibbard & Gilburt, 2014).

Self-efficacy in HD patients is formed from a person's confidence in applying behavior and increasing efforts to solve problems faced to maintain these behaviors (Ryan, 2009). Self-efficacy is interpreted as a condition of personal self-confidence that can understand the way of one's thinking and motivation for active behavioral change when faced with obstacles or barriers (Williams & Rhodes, 2016). Previous studies show that self-efficacy has been associated with self-management behaviors in chronic disease patients (Yao et al., 2019). To improve self-management behaviors, multiple strategies should be

conducted to improve patients' self-efficacy. Social support is an important aspect to enhance self-efficacy, and previous studies have shown that a person's self-efficacy has a positive correlation with the social support they receive; that is, the more social support a person receives, the higher their self-efficacy is (Wang, Qu, & Xu, 2015).

Social support has become an influencing factor in chronic disease patients' participation in health behavior (Pamungkas, Chinnawong, & Kritpracha, 2015). Most HD patients do not work and spend a lot of time undergoing treatment, and social support becomes a very important requirement (Kusuma, Ropyanto, Widyaningsih, & Sujianto, 2018). Patients who have better support tend to have a more positive state of mind in making better use of available resources to solve the problems they face (Li et al., 2014). Peer support happens when people who have similar experiences of something difficult come together to support each other (Side by Side Research Consortium, 2017). Peer support programs are carried out by sharing the experiences for improving HD self-management skills through informational support, emotional support, and mutual reciprocity (Husain, Kusuma, & Johan, 2018; Taylor et al., 2016). Patients who are members of a group exchange experiences about various problems faced and also share about how to overcome these problems. This activity makes each patient feel they have the same problem, need each other, and can give support to each other (National Kidney Foundation, 2009). Patients may help each other in ways that health care providers may not be able to by sharing lived experiences and support (Russell et al., 2017). In this study, peer support program was conducted for six meetings, two times a week for 30-45 minutes each meeting to solve the problems together about fluid restriction management, nutrition and treatment management, and emotional management. Furthermore, the patients also had the opportunity to share their experiences with other patients, assessed problem solving, anticipated obstacles, and maintained new behaviors during the program. Such factors promoted problem-solving, anticipation of obstacles, and maintenance of new behaviors (Pamungkas et al., 2015). These methods made patients more confident in their abilities in order to deal with their conditions.

This study has limitations, researchers did not distinguish between self-management measurement between peer leaders and their members, because the selection of peer leaders was based on mutual agreement between group members. Some patients who have good self-management, are unable or unwilling to become peer leaders to lead the discussion. Thus, researchers as facilitators motivated patients who already had good self-management to talk about self-management.

CONCLUSION
This study showed that peer support programs affected the increased self-management in patients with ESRD undergoing hemodialysis. Peer support programs should be introduced early to patients undergoing hemodialysis so that they can learn about self-management from other patients. Patients may help each other in ways that health care providers may not be able to by sharing lived experiences and support. Further research can be conducted by involving a larger number of samples, providing communication training for peer leaders, and adding outcomes objectively to laboratory results.

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Lived Experiences of Adolescents with Internet Addiction

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ABSTRACT

Background: Internet addiction has been and will become a serious global problem in the future. Understanding the lived experiences of adolescents with Internet addiction is crucial for providing appropriate nursing interventions.

Purpose: This study aimed to explore the lived experiences of adolescents with Internet addiction.

Methods: This was a phenomenological study involving in-depth interviews with seven adolescents with Internet addiction. Data were analyzed using the Colaizzi's approach of analysis.

Results: Six themes were identified from this study: the feeling that playing with the Internet is more important than the school; become "too lazy to move" and unable to manage time; physical health disorders due to Internet addiction; the feeling that it is difficult to be away from the Internet, and social interaction difficulties in the real world, which then leads to hostile attitude due to the lack of ability to control emotions.

Conclusion: The lived experience of adolescents with Internet addiction is complicated and impacted on all aspects of teenagers' lives. These findings provide insights for nurses in preventing and overcoming Internet addiction problems among teenagers.

Keywords: Adolescents; lived experience; Internet addiction

BACKGROUND

Currently, Internet use has become one of the issues that attract the attention of the academic world since Internet use may trigger Internet addiction (Young & De Abreu, 2011). According to Young (2017), a person is said to have Internet addiction when he or she uses the Internet for more than 6 hours per day in three consecutive months. Meanwhile, according to Yang and Tung (2014), Internet addiction in adolescents is characterized by the difficulty in controlling the desire to continue using the Internet respectively. Databoks (2020), in their survey of Internet use in Indonesia among Indonesians aged 16-60 years stated that Indonesians spend nearly 8 hours per day on the Internet. This means that Internet users in Indonesia have the potential to suffer from Internet addiction if the Internet is used not for productive reasons.

According to a survey conducted by the Association of Indonesian Internet Service Providers (Asosiasi Penyelenggara Jasa Internet Indonesia, APJII) in 2017, the total number of Internet users in Indonesia continues to grow year to year. The total number of Internet users in this country was 132.7 million people in 2016, which increased to 143.26 million in 2017 and 175.3 million in 2020, or 64% of the total population of Indonesia (Databoks, 2020). Most of the Internet users live in Java Island.

A preliminary study conducted by the researchers at the Public Health Centers (*Pusat Kesehatan Masyarakat,* Puskesmas) in Cimahi, Indonesia found some teenagers used the Internet more than 8 hours and found it difficult to free from Internet. For example, R who 15 years old and the son of one of the health cadres in the area. He was a student of one of the Vocational High School in Bandung. It was very difficult for R to control himself in terms of using the Internet or playing online games in Internet cafes. R usually played online games on the Internet after school until midnight, around 12 to 1 a.m. If, for example, R fell asleep earlier, such as at 7 p.m., he would wake up at 11 p.m. or 12 a.m. and played the game with his friends until dusk. R often overslept, missed the fajr prayer, and late to school. He did not only play the online game at home but also went to the Internet cafe from noon to before sunset. Sometimes, his mother had to pick him up from the Internet cafe to stop him from playing the game. R said that he often got sick due to fatigue and lack of sleep so he often skipped school. When R's mother forbade him from playing with his mobile phone, R could study or sleep well at night; R got angry with his mother instead.

Internet addiction in adolescents can have negative impacts such as triggering obsessive-compulsive behaviors, depression, anxiety, and hostile attitude towards the real world. Addiction can also make adolescents experience fatigue, disturbed sleep patterns, decreased academic achievement, and also posing the risk for juvenile delinquency (Kim, 2013; Li, O'Brien, Snyder & Howard, 2015). This notion is supported by the works of Wee et al., (2014), Ybarra, Alexander, and Mitchell (2005), and Yen, Chou, Liu, Yang, and Hu (2014) which also suggested that Internet addiction also have a significant impact on adolescent life, such as triggering depression, anxiety, physical and mental health deterioration, disrupted interpersonal relationships and decreased performance on life daily. Hakim and Raj (2017) also added that the negative impact of Internet addiction in adolescents includes the tendency to access the Internet even though friends are trying to talk to them. The habit of accessing the Internet also affects the eyes, causes difficulty to sleep, often leads to procrastinating, and decreases academic achievement due to the strong preference to access the Internet than to study.

With so many studies suggested negative impacts of Internet use in adolescents, no studies explored in-depth the experience of adolescents with Internet addiction. it is necessary to understand the life experiences of adolescents regarding the use of the Internet, especially the experiences of those who experience Internet addiction.

PURPOSE
This study aimed to gain a deep understanding of the lived experiences of adolescents with Internet addiction.

METHODS

Research design and participants

This study used a phenomenological approach to answer questions about experiences or meanings from the participants' viewpoints (Tauba, Suryani, & Rafiyah, 2020). This approach is considered appropriate as it allowed the researchers to gain a deep understanding of the participants' experiences. Seven participants who were selected using a purposive sampling technique were involved in this study. The inclusion criteria for participants were adolescents who use the Internet for more than six hours per day in 3 consecutive months for non-productive leisure activities and aged between 12 to 18 years old. Meanwhile, the exclusion criterion was adolescents who withdrew from participation in the study. Informants were recruited through the *Puskesmas* based on the information from health cadres working in the area of study.

Data collection

Data collection was performed through in-depth interviews by asking open-ended questions using the probing question techniques to explore the lived experiences of adolescents with Internet addiction. Three interviews, each lasted 45-minute to 1-hour, were performed on each informant. The first interview aimed to collect information while the second was to validate the transcript, and the third was to validate the themes.

Data analysis

Data collected were then analyzed using the Colaizzi's approach. Information submitted by the participants were then transcribed. The transcribed interviews were read and reread several times to get insight. Each transcript was analyzed for a significant statement. There were 165 significant statements obtained from the transcript. All significant statements were transformed to formulated meaning. The next step was to look for common categories or sub-themes across the entries for each significant statement and formulated meaning. There were 17 sub-themes derived from significant statements and formulated meaning. The 17 sub-themes were then analyzed and categorized into 6 themes by reading and re-reading the transcribed interviews, significant statements, formulated meaning, and sub-themes. Narratives were developed using the themes based on the statements from the participants. To maintain strictness in data analysis, bracketing was employed in the analysis process to understand the experiences of the participants as they truly were. The researchers reviewed each of the participants' significant statements and assigned meaning to each. This required the consideration of both the explicit and implicit meanings inherent in each statement.

Ethical considerations

Before starting the data collection, ethical clearance was obtained from the Ethics Research Committee of the Faculty of Medicine, Universitas Padjadjaran with the issuance of ethical clearance number 771/UN6.KEP/EC/2019. Before collecting data, informed consent was obtained from the parents of the participants.

RESULTS

Informant characteristics

Seven adolescents participated in this study, consisting of three girls and four boys. The age of the informants ranged from 13-18 years old and they were studying in Junior High

School and Senior High School. The informants accessed the Internet using mobile phones and computers and had started to access the Internet since they were in elementary school. They mostly used the Internet to play online games, watch Korean dramas, and access social media.

Themes
There were six themes identified in this study: the feeling that playing with the Internet is more important than the school; become "too lazy to move" and unable to manage time; physical health disorders due to Internet addiction; the feeling that it is difficult to be away from the Internet; and social interaction difficulties in the real world, which then leads to hostile attitude due to the lack of ability to control emotions. These themes were retrieved from the statements from the informants during the interview.

Feeling that playing with the Internet is more important than the school
Based on the results of the analysis after repeated readings of transcripts, the first theme that emerged was "feeling that playing with the Internet is more important than school". All informants experienced this feeling, although in different ways. Informant 2 felt that the game scores were more important than the school grades:

> *"It's important to play the game; for school, we just need to pass the exams. Grades are not important. If I get poor grades, just (take remedial tests) to fix it." (P2.49)*

Informant 1 added that since he/she became familiar with online games and social media, he/she did not even bother to study for final exams. This informant was more focus on social media and games:

> *"Honestly, my academic performance is deteriorating... since I become familiar with social media and games, even when I have a test, I never study. I just want to play games. When my parents told me to study, I get angry." (P1.10)*

A similar statement was also given by Informant 3 who also never bothered to study and was more focus on playing games than studying:

> *"I never study. What is the use of studying? It's better to play games." (P3.32)*

Informant 3 also stated that the most important thing for him/her was to play games, he/she did not care about the grades:

> *"If my school grades decline, I don't care. The important thing is just able to continue to the next grade. The exam grades do not matter." (P3.45)*

Become "too lazy to move" and unable to manage time
"Too lazy to move" or *Mager* is the term that Indonesian adolescents often use to describe the laziness to do any other activities. Adolescents use this term when they feel that they are already comfortable with their current activity, especially leisure activities like relaxing, lying down, or playing with the Internet, that they do not have the eagerness to do anything else. This theme has some sub-themes as described below.

Mager or "too lazy to move"
This experience was expressed by several informants. These informants revealed that as a result of prolonged Internet use or playing games, they became too lazy to move:

> *"If, for example, hmmm (I) have already sat on the bed in my room and playing with my mobile, then (I) just keep playing with my mobile. I cannot move, cannot get up from the bed. So, mager. If a friend invites me to his or her home, I refuse because I am 'too lazy to move' and (I) am to absorbed with the Internet."* (P1.31)

Forget time
Playing with the Internet is a fun activity that causes the informants to forget time. They spent all their time playing with the Internet. Informant 4 described this situation:

> *"All my activities were neglected because I spend all my time was to play games and do other activities on the Internet."* (P4.34)

Informant 6 also described in detail the reason why he/she forgot the time:

> *"The negative impact of playing with the Internet if you ask me, I become ignorance towards the time because when (I) go to social media, (I) become increasingly curious (and I) want to know more."* (P6.23)

Another informant also said that because he/she was too engrossed in playing Internet, he/she had no time for doing other activities:

> *"...as a consequence I become too lazy to do other activities."* (P6.23)

Physical health disorders due to Internet addiction
Informants stated that because they were engaged in playing with the Internet for a long duration, they experienced headache, pain in the eyes, pain in the shoulders, and stiffness:

> *"So, when (I) play with my mobile phone for too long, yes, I feel dizzy, pain in the eyes, and then my body feels stiff, not feeling well because I spend too much time on the bed without moving."* (P1.26).

Informant 4 stated that his/her physical condition was deteriorating because he/she spent too much time playing games and also due to lack of rest or sleep:

> *"(I) have a headache. Because of lack of sleep, because well, I play games continuously. Other than lack of sleep, (I) also feel pain in (my) eyes."* (P4.8).

Feeling that it is difficult to be away from the Internet
Almost all informants felt that they were dependent on the Internet. They felt that they could not stop using the Internet and forgot everything. Furthermore, they also felt that there was something missing in their life if they did not access the Internet. They felt that they were inseparable from the Internet:

> *"Because (I am) addicted to a mobile phone, I feel that something is missing in my life if I don't have my mobile phone with me."* (P1.62).

Informant 1 also shared the feelings of hollowness and like dying when not playing with his/her mobile phone because he/she thought that the mobile phone was a necessity:

> *"Well, addicted. So, it becomes a very important thing that I need in my life. If I don't have my mobile phone, I feel like I am dying."* (P1.67)

Even participants felt playing games the game it as a remedy for his/her boredom:
> *"Playing games for me is the remedy for "bete" and boredom. So when I play games, I feel happy and excited." (P1.39)*

Bete is a term often used by adolescents in Indonesia to express boredom. According to the Wiktionary, the word *bete* or BT is an abbreviation of "bored totally" or "boring total" or totally bored. The word bête, in addition to showing boredom, also contains the element of feeling upset about a condition or situation.

Because they cannot be separated from the Internet, the informants did various ways to always be connected to the Internet such as, for example, looking for facilities that are always connected to the Internet. They even stole their parents' money to buy Internet credits. When the Internet credit was used up, one of the informants used his/her parents' or family's hotspot in order not interrupting the Internet connection:
> *"If my credit is used up, I asked for a hotspot to my mother or sister, or go to a friend's house that has a wifi connection to play." (P5.60)*

Informants also said that they would borrow money from their friends when their Internet credit was used up:
> *"I often call my friend at midnight to buy Internet credit. It happens that my friend owns a mobile phone counter. I pay for it the next day when I go to school." (P6.43)*

Another way that the informants used was to secretly take the parents' money to buy credit:
> *"...and then I went to my mom's room, looking for money in her cupboards. When I saw small changes such as one thousand, two thousand, I took them and collected them. Then I used the money to buy the Internet credit. But I didn't tell my mom that I took the money." (P6.55)*

Social interaction difficulties in the real world
This theme has two sub-themes: informants feel more comfortable in the virtual world than the real world and informants feel that it is difficult to do social interactions in the real world.

Feel more comfortable in the virtual world than the real world
Prolonged use of the Internet has caused the informants to feel more comfortable in the virtual world than in the real world:
> *"The social interaction is via a game, via online, online game. While talking through a phone call." (P4.11)*

Informants stated that they would prefer to play with their mobile phone than hanging out with their friends because they thought that their friends were sometimes boring:
> *"If I am invited to play (with my friends) hmm yes I would choose to play with my mobile phone because playing with friends is sometimes boring. So, it is more comfortable to play with the mobile phone than to play with them directly." (P7.18*

Difficult to do social interactions in the real world
This subtheme was identified based on the statements from some participants that clearly revealed the feeling that it was difficult and annoying to do social interactions with friends and family:

> "*When I am playing with my mobile, I cannot do social interactions with friends.*" *(P1.32).*

Besides having difficulties in interacting with friends, informants also stated that they rarely interacted with family when playing games:

> "*When I'm playing a game, my focus is on my mobile phone, so I and my family rarely interact, rarely talk, because I like to play the game continuously. I keep on playing with my mobile phone.*" *(P1.60).*

The same condition was also experienced by the informant 2:

> "*Well, I feel that I don't really interact with my friends. It should be that I interact with them, talking to them, but I instead play on my mobile phone.*" *(P2.108)*

The informant added that he/she never had a long conversation with his/her friends as he/she would revert back to his/her mobile phone:

> "*If I meet a friend, I will chat a bit as usual. But only briefly, around 15 minutes or 10 minutes. After that, we are back to our own mobile phone, busy with it.*" *(P6.14)*

Hostile attitude due to the lack of ability to control emotions
All informants revealed that they had experienced emotional disturbance since they started to experience Internet addiction. The sub-themes of this theme are hostility between Internet users, angry and annoyed when using the Internet too much, scolded by parents because of playing with the Internet continuously, and felt that it was difficult to interact with the surrounding environment or the real world.

Other than the excitement and the fun in playing games, there was also hostility among friends when they played games. Informant 3 mentioned about this hostility:

> "*Playing Internet like online games is exciting, but sometimes we mock each other. I also fought in the past...with my friends. Because I was so pissed off, I pushed his/her head into a container full of water.*" *(P3.107)*

In addition to fights between Internet users when losing a game, frustration and anger were also expressed when they lost the game:

> "*Slam the table like this (*while demonstrating who he/she slammed the table*). Well, I just grumble when I lose a game.*" *(P3.55).*

In contrast to informant 3, informant 4 slammed the mobile phone when he/she was angry and annoyed because he/she lost the game:

> "*I am angry if I lose the game. I once slammed my mobile phone because I was pissed off.*" *(P4.18)*

The informants were not only angry when they lost the game. They also got angry when they were disturbed while playing the game:

> *"...when I play games online if a friend calls me (on my mobile), I will reject (the call) because I can't be disturbed." (P4.10)*

DISCUSSION

Feeling that playing with the Internet is more important than the school

The first theme identified in this study is "feeling that playing with the Internet is more important than the school". Informants revealed that they never study and grades in school have declined since they started to use the Internet for social media, online games, Korean drama, and so on. This results in declined school grades, and according to the informants, it is not something that they should worry about because they think that they just need to pay a certain amount of money to move up to the next grade in school. This is in line with the findings of Young and De Abreu (2011) stating that Internet addicts cannot stop the desire to go online that they lose control of their use of the Internet. Internet addiction is as bad as drug, alcohol, and gambling addictions which result in academic failure and reduced performance. This is also supported by Leung and Lee (2016) who stated that Internet addiction is excessive use of the Internet that it disrupts daily activities.

Internet addiction, especially online game addiction, is an addiction that is often encountered these days due to the increasingly easy access to the Internet. Currently, online games can be accessed and played not only through a personal computer but also through a smartphone (Montag & Reuter, 2017). Masya and Candra (2016) suggested that online games affect students by making them lazy to learn and often use their free time to play the game. Online games also trigger students to find time to play, even skip school just to play games. A similar phenomenon was also seen in this study, with one of the informants stated that games already disturbed his study: Since he becomes familiar with social media and games, even when he has a test, he never studies.

Become "too lazy to move" and unable to manage time

The emergence of the Internet as an electronic media was initially aimed at becoming an intermediary tool for interactions between people, such as through social media, entertainment supporting applications, and so on (Young, 2009). One of the features in the Internet world that are quite developed, and even provide entertainment is online gaming (Leung & Lee, 2016). However, adolescents can be negatively affected by it, as revealed in this study. When the informants become addicted to the Internet, they become "mager" or too lazy to move and just lying on the bed in the bedroom to play with the Internet. The informants even forget to take a bath. In addition, the negative impact of the online games is that the real world activities become neglected because the players are absorbed in the game that they neglect their main activities and find it difficult to manage time (Chiu, Lee & Huang, 2004). Just as in the study by Chiu, et al (2004), the informants in this study revealed that they do not want to do activities when they are already on their mobile phone. They find it difficult to manage their time because they are too absorbed in playing with the Internet.

Young (2009) mentioned that playing with the Internet is an activity that can drain emotions and make people spend more time with the Internet, losing control of time,

experiencing academic difficulties, and experiencing difficulties in building and maintaining relationships. Individuals who are addicted to the Internet will also refuse to sleep, eat, exercise, and do social and financial activities that it disrupts health and other life activities.

Physical health disorders due to Internet addiction
Excessive use of the Internet does not only cause mental disorders, but also causes physical disorders. According to Hasanzadeh, Beydokhti, and Zadeh (2012), physical health disorders due to the excessive use of the Internet include headache, pain, and stiffness of the neck, back (carpal tunnel syndrome), as well as a reduced immune system that addicts easily get sick. This concurs with the experiences of the informants. When they played with the mobile phone for a long time, they would feel dizzy, pain in the eyes, and stiffness in their body.

According Wijaya, Wijayanthi, and Widyastuti (2019), there is a correlation between prolonged sitting with lower back pain among teenagers due to playing online games. Factors that cause back pain include posture abnormality resulting in nerve disorders and impaired blood circulation and the habit of sitting in one position for a long time without any break. Another study by King, et al. (2013) revealed that people who experience Internet addiction may experience intense insomnia. This is also mentioned by the informant in this study:

Feeling that it is difficult to be away from the Internet
The third theme in this study is "feeling that it is difficult to be away from the Internet". The Internet is a very important necessity for all informants that the informants feel that they are going to die if they do not have access to the Internet. Even to be offline for one hour is already very difficult for the informants. Furthermore, when they tried to turn off their mobile phone to sleep, they feel restless and anxious that they turn on the mobile phone again. This makes the informants stay up late every night.

According to Perdew (2014) doing fun activities on the Internet can make someone addicted because it increases dopamine production. The pleasurable activities performed repeatedly on the Internet will make the brain respond by producing more dopamine so the person want to do it again and again. This situation will spur someone to increase the duration or intensity of Internet use and it will be difficult to break away from it.

Masya and Candra (2016) reported that there are internal and external factors that cause an adolescent to become addicted. The internal factors are boredom at home, inability to set priorities in life, and lack of self-control. The external factors are less controlled environment because they see other friends also play with the Internet, lack of good social relationships, and high parental expectation that is imposed on the child. This is supported by Ariani, Suryani, and Hernawaty (2018) in their research that suggested parental attachment as the most dominant factor for the occurrence of Internet addiction.

When not connected to the Internet, the individual feels like he/she loses one important thing in him/herself, so they experience the urge to do various attempt to be able to reconnect with the Internet. Based on the findings of Weinstein, Dorani, Elhadif,

Bukovza, Yarmulnik, and Dannon (2015), Internet addicts have similar characteristics to drug addicts, which is that their thought and emotion are bound to what makes them addicted. In more severe cases, the urge of the mind and emotion make a person do anything, including committing crimes as found from this study. This is supported by the finding of Weinstein, et al. (2015) who studied 120 students. They discovered that 50% of respondents said they feel uneasy if their mobile phone is not connected to the Internet. When they were asked about items to be rescued in the event of a fire, respondents made the mobile phone as their top priority. This is congruent with the results of a study conducted by Mudrikah (2009) in Sidoarjo, Indonesia, on 127 high school students, which found that Internet addiction causes psychological problems for users that trigger them to do various bad behaviors to always be connected to the Internet. This is also proven in this study as the informants stated that they took their parents' money secretly to buy Internet credit or borrow from a friend to be able to buy the credit.

Playing with the Internet, particularly playing online games, may cause uninterrupted pleasure. Several researchers have reported that the computer and online games should receive attention as they can cause dependence for its users (Holt & Kleiber, 2009; Hsu, Wen, & Wu, 2009). However, until recently the Indonesia government has not yet had a strategic program to overcome this problem. Although there has been a joint decree with four ministers *(SKB 4 Menteri)* regarding overcoming Internet addiction in adolescents, the implementation is still not going well.

Social interaction difficulties in the real world

A person who is addicted to the Internet will focus on the Internet only that he or she will feel more comfortable in the virtual world than in the real world, leading to withdrawal from social interactions. Individuals who are addicted to the Internet will spend more time using the Internet than interacting directly with family and friends. Kusumawardani (2015) in her study found that teenagers with Internet addiction especially game addiction will have trouble in social interaction because too focus on the game.

In line with Kusumawardani (2015), in this study, it was also found the link between Internet addiction and various unhealthy user behaviors, including lack of social skills. Individuals who lack social skills will have more severe Internet addiction and they perceive that friendship in the virtual world is easier to build than friendship in real life (Mustafa, 2011). Also, when gathering with families or friends, an Internet addict will be preoccupied with his/her mobile phone to update their status on Twitter, Facebook, and other social media so that they cannot communicate well. They are only busy with their mobile phone. Therefore, the Internet and social media make people anti-social and do not care about their environment (Hasanzadeh et al, 2012).

Hostile attitude due to the lack of ability to control emotions

Hostility is one of the negative effects arising from the excessive use of the Internet. It is as expressed by a participant who experienced hostility or fights with other Internet users due to anger and emotional trigger. This negative emotion will lead to violent behavior when they cannot cope with the situation. Gezgin, Cakir, and Yildirim (2018) found that there is a strong relationship between the inability to control emotions and Internet use behavior. This concurs with Choo, Gentile, Sim, Li, Khoo, and Liau, (2010) and Gezgin

et al. (2018) who stated that the symptoms caused by prolonged use of the Internet are hostility, unfriendly behavior, mocking between Internet users, and hate between users. Furthermore, Nie (2001) found that online social interaction has a greater psychological burden than offline interaction. Someone who interacts online more often mock one another compared to those who interact offline, which will then cause hostility.

In contrast, a study by Hakim and Raj (2017) found that when facing a problem, participants in their study accessed the Internet more frequently to open Youtube for funny videos, Youtubers' vlogs, and social media to just share their feeling with friends. Participants felt relieved and happy after accessing the Internet that their mood improved. On the other hand, an experimental study by Barlett, Harris, and Baldassaro (2017) showed that action online games significantly increase the aggressiveness of the users. This type of hostility is more apparent when a person often plays action games (Ko, Yen, Chen, Yeh, & Yen, 2009). Therefore, aggressive behavior in an online game is often associated with the hostility between online game players, making them prone to the Internet Gaming Disorder (IGD). The expressions of some informants in this about their anger and resentment when using the Internet to play online games support this notion. Feelings of anger and resentment also have an impact on the surrounding environment.

CONCLUSION
This study explored the lived experiences of adolescents with Internet addiction. Six themes of the general impacts of Internet addiction on informants' lives were identified, including the feeling that playing with the Internet is more important than the school; become "too lazy to move" and unable to manage time; physical health disorders due to Internet addiction; the feeling that it is difficult to be away from the Internet; and social interaction difficulties in the real world, which then leads to hostile attitude due to the lack of ability to control emotions. The findings of this study provide insight for health professionals, especially nurses in preventing and overcoming Internet addiction problems among adolescents. However, further research is needed on appropriate interventions in overcoming Internet addiction with reference to the findings of this study.

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CONFLICT OF INTEREST
There is no conflict of interest in this article.

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Self-Efficacy Affects Cancer Patients in Solving Problems, Seeking Support and Avoiding Problems as Coping Mechanisms

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ABSTRACT

Background: Cancer is a disease that causes various physical and mental problems. Being diagnosed with cancer affects the self-efficacy and behavior of individuals to choose a coping mechanism in facing the problem.

Purpose: This study aimed to determine the effect of self-efficacy on solving problems, seeking support, and avoiding problems as coping mechanisms in cancer patients.

Methods: A cross-sectional study was conducted on 45 cancer patients selected using a total sampling technique from two public health centers in Surabaya, Indonesia. Data were collected using the General Self-Efficacy Scale and Coping Strategy Indicator, and analyzed using the Shapiro Wilk for data normality, and linear regression to determine the effects of self-efficacy on solving problems, seeking support, and avoiding problems with $p< 0.05$.

Results: The results showed the participants' rate of self-efficacy levels (M=3.26), and coping mechanism levels in solving problems (M=3.46), seeking support (M=2.88), and avoiding problems (M=3.27), as well as mean scores of self-efficacy (32.6±3.8), solving problems (34.6±3.8), seeking support (31.8±3.7), and avoiding problems (32.7±3.2). Based on the linear regression test, there was a significant effect self-efficacy on solving problems ($p<0.001$; R^2=0.97), seeking support ($p<0.001$; R^2=0.98), and avoiding problems ($p<0.001$; R^2=0.98) as coping mechanisms.

Conclusion: Cancer patients who had high self-efficacy scores would choose solving problems and seeking support as the coping mechanisms, but those with lower scores on self-efficacy prefer to avoid the problems.

Keywords: Avoiding problems; seeking support; self-efficacy; solving problems

BACKGROUND

Cancer is known as a deadly and incurable disease. Globally, cancer is estimated to increase to 18.1 million new cases, and in 2018 there are an estimated 9.6 million deaths

from cancer. Cancer deaths worldwide in 2018 is estimated to occur in Asia, partly because this region has almost 60% of the global population. In Europe, there are 20.3% and 14.4% in America. The proportion of cancer deaths in Asia and Africa (57.3% and 7.3%, respectively) is higher than the proportion of incident cases (48.4% and 5.8%, respectively) as these areas have a higher frequency (World Health Organisation, 2018). The prevalence of cancer in Indonesia is 1.8 per thousand inhabitants. The highest prevalence is in Yogyakarta province, while the lowest one is in West Nusa Tenggara. The highest prevalence of cancer is in the age group of 55-64 years old, at 4.6 per thousand inhabitants, while the lowest one is in children aged < 1-year-old. Based on sex, women tend to have a higher risk than men (Health Research and Development Agency, 2018).

Fear, trauma, or feeling close to death are the first responses when diagnosed with cancer (Robb, Simon, Miles, & Wardle, 2014). The majority of cancer patients feel anxious and worried about an uncertain future (Grupe & Nitschke, 2013), and also feel severe stress (Werdani, 2017). The high emotional stress affects the patients' functional status and causes the patients to lose enthusiasm for life (Saeedi-Saedi, Shahidsales, Koochak-Pour, Sabahi, & Moridi, 2015). Cancer patients who experience anxiety and depression greatly influence their self-efficacy (Omran & Mcmillan, 2018), and are more likely to have low self-efficacy scores (Rizeanu, Bubulac, & Popa-velea, 2018). Self-efficacy has an influence on physical and mental health, quality of life, and health information-seeking behaviour in cancer patients (BorjAlilu, Kaviani, Helmi, Karbakhsh, & Mazaheri, 2017). A study stated that self-efficacy is considered a form of coping that can affect the quality of life in cancer patients (Chirico et al., 2017). Coping strategies that focus on emotions have a significant negative correlation with total symptoms and functional dimensions in the quality of life (Kahrazei & Maleknia, 2015).

Cancer management through therapy in patients has various side effects, such as pain, nausea, vomiting, fatigue, hair loss, excessive bleeding, weight loss, fever, diarrhea, and lumps (Aslam et al., 2014), as well as sleeplessness, difficulty in breathing, anorexia, and constipation (Afiyanti, Wardani, & Martha, 2019). These physical effects can cause changes in the psychological conditions of cancer patients, such as depression and stress. A study reported that cancer patients who experienced cancer-related fatigue (CRF) feel stress, depression, and anxiety; furthermore, the stress is closely related to worse rates of survival and higher mortality in cancer patients (Weber & O'Brien, 2017). The individuals' responses to stress are shown to be coping mechanisms. A study stated that cancer patients who experienced mild to moderate stress tend to have adaptive coping mechanisms, while those who experienced severe stress tend to prefer maladaptive coping mechanisms (Werdani, 2017). Coping strategies commonly used by cancer patients were seeking emotional support, positive reframing, self-blame, and denial, which affects the quality of life (Nipp et al., 2016). A majority of previous studies examined psychological disorders such as stress, anxiety, and depression, which can affect self-efficacy, and coping strategies related to the quality of life, as well as the relationship between self-efficacy and general coping mechanisms (adaptive or maladaptive copings). However, no research studied the effects of self-efficacy on three dimensions of coping mechanism details (solving problems, seeking support avoiding problems), especially in cancer patients. It is, therefore, necessary to examine how self-

efficacy affects solving problems, seeking support, and avoiding problems as coping mechanisms in cancer patients.

PURPOSE
This study aimed to determine the effects of self-efficacy on solving problems, seeking support, and avoiding problems as coping mechanisms in cancer patients.

METHODS
Design and samples
The present research was a cross-sectional study, involving simultaneous data collection on independent and dependent variables. The samples were 45 cancer patients were conscious and aged more than 17 years old in two public health centers in Surabaya, Indonesia. A total sampling technique was used to recruit the samples.

Instruments and data collection
This study used the General Self-Efficacy Scale (GSE) adopted from a previous study by De las Cuevas and Peñate (2015) to measure self-efficacy's scores, and the Coping Strategy Indicator (CSI) adopted from Togas and Alexias (2018) to measure the scores of solving problems, seeking support, and avoiding problems. The GSE consists of 10 closed-ended questions using a 4-point Likert scale (1=not at all true, 2=hardly true, 3=moderately true, 4=exactly true). Meanwhile, the CSI is composed of three parts. The first part consists of 11 closed-ended questions that describe solving problems, while the second and third part consists of 10 closed-ended questions each that describe seeking support and avoiding problems, respectively. The section of solving problems and seeking support uses a 4-point Likert scale (1=never, 2=occasionally, 3=sometimes, 4=always), while the section of avoiding problems applies reversed Likert scales (1=always, 2=sometimes, 3=occasionally, 4=never). The questionnaires had been back-to-back translated into the Indonesian version by reliable translators, and tested for their validity and reliability by the researchers. The general self-efficacy scale showed the R of 0.831-0.948 with a Cronbach's alpha of 0.921, while the coping strategy indicator showed the R of 0.890-0.932, with a Cronbach's alpha of 0.931. After consented for participation, respondents completed the demographic data and the questionnaires. The data were collected in April 2019.

Data analysis
The collected data were entered into SPSS 25.0 and tested for normality using the Shapiro Wilk test ($p>0.05$). The results showed that the data were normally distributed ($p=0.314$ for self-efficacy; $p=0.60$ for solving problems; $p=0.195$ for seeking support, and $p=0.165$ for avoiding problems). A further analysis was performed using the step linear regression test to examine effects of self-efficacy on solving problems, seeking support, and avoiding problems.

Ethical considerations
This study obtained ethical approval from the Research Ethics Committee of Medical Faculty, Widya Mandala Catholic University (No. 003/WM12/KEPK/T/2019). Prior to the study, all respondents were informed of the research purposes, advantages, procedures, and risks, as well as signed an informed consent.

RESULTS
Characteristics of participants
The result showed that more than half of the participants were old, ranging from early older adults to the elderly. The stages of cancer varied from stage I-IV, and most of the participants have been diagnosed with cancer for 1-3 years. Almost all participants had a support system from their nuclear families, such as their parents, daughter, or son.

Table 1. Demographic characteristics of the respondents (n=45)

Variables	*n*	%
Age (years), M±SD = 54.1±13.8		
17 – 25 (adolescent)	3	7
26 – 35 (early adulthood)	1	2
36 – 45 (late adulthood)	7	16
46 – 55 (early older adult)	11	24
56 – 65 (late older adult)	14	31
>65 (elderly)	9	20
Gender		
Female	34	76
Male	11	24
Cancer Stage		
I	1	2
II	20	44
III	16	36
IV	7	16
Unknown	1	2
Duration of cancer diagnosed (year)		
< 1	3	7
1 – 3	23	51
4 – 6	8	18
> 6	11	24
Support system		
Nuclear families	38	85
Extended families	5	11
Others	1	2
Alone	1	2

Self-efficacy in cancer patients
Table 2 showed that in the level of self-efficacy in cancer patients, there were three top components of self-efficacy, comprised of *managing to solve the difficult problems* (*M*=3.47), *ability to adapt to all situations* (*M*=3.38), and *finding a way out of the problems* (*M*=3.33).

Table 2. Self-efficacy in cancer patients (n=45)

	Component of Self-Efficacy	Min	Max	Mean	SD
1.	I always manage to solve difficult problems	3	4	3.47	0.50
2.	I can find a way out of problems	2	4	3.33	0.52
3.	I have no difficulty in achieving a goal	2	4	3.02	0.58

Component of Self-Efficacy	Min	Max	Mean	SD
4. I can adapt to all situations	2	4	3.38	0.58
5. I can solve problems in any situation and condition	2	4	3.31	0.56
6. I have a solution for every problem	2	4	3.24	0.57
7. I'm sure that I can solve a problem with the ability that I have	2	4	3.29	0.59
8. I have been able to overcome every difficulty because I had many ideas	2	4	3.16	0.47
9. If I am in trouble, I can think of a solution quickly	2	4	3.16	0.47
10. I am always ready to face problems	2	4	3.27	0.54

Dimensions of coping mechanisms in cancer patients
Table 3 showed that there were three top components in solving problems (*M*=3.46), comprising of *enthusiasm and effort in solving the problems* (M=3.84), *full attention to solve the problem* (*M*=3.80), and *planning an action carefully before doing something* (*M*=3.60). For seeking support as a coping mechanism (*M*=2.88), there were two top components, comprising of *the hope that the family will continue to help in solving a problem* (*M*=3.49), and *receiving help and support from friends and family in solving the problem* (*M*=3.29). For avoiding problems as a coping mechanism (*M*=3.27), there were three top components in avoiding problems, comprising of *staying away from others* (*M*=3.73), *avoiding others* (*M*=3.64), and *relieving stress by imagination* (*M*=3.64).

Table 3. Dimensions of coping mechanism in cancer patients (n=45)

Coping Mechanisms	Min	Max	Mean	SD
Solving problems				
1. When I get into trouble, I think of a way out of my problem	1	4	3.33	0.74
2. I think first before making a decision	2	4	3.56	0.66
3. I have several ways to deal with difficult situations	1	4	3.00	0.80
4. In making choices, I'm always careful	2	4	3.49	0.73
5. I thought of a solution to the problem I was having	1	4	3.36	0.83
6. I turned my full attention to solving a problem	3	4	3.80	0.40
7. I have a plan for every problem I faced	1	4	3.13	0.99
8. I remained enthusiastic and made an effort to solve the problems I faced	2	4	3.84	0.42
9. I tried to solve the problem I was facing	2	4	3.56	0.72
10. I plan an action carefully before doing something	1	4	3.60	0.75
Seeking support				
1. I tell friends about my problems	1	4	2.58	0.69
2. Even though I am in trouble, I still get the attention and support of others and my family	2	4	3.71	0.59
3. I feel better if I share the problem I am facing with others	1	4	2.80	0.87
4. I talk to my family about the fears and worries that I am experiencing now	1	4	2.64	0.98
5. Telling others about my situation can help me find a solution	1	4	2.80	0.81

	Coping Mechanisms	Min	Max	Mean	SD
6.	I went to a health professional to help me feel better	1	4	2.56	0.87
7.	I went to a friend to help me feel better about the problem	1	4	2.22	0.97
8.	My friends always provide solutions when I am in trouble	1	4	2.82	0.96
9.	I get sympathy and attention from people who have the same problem as me	1	4	2.84	0.98
10.	I received help and support from friends and family in solving the problem I was experiencing	1	4	3.29	0.89
11.	I hope my family will continue to help me in solving my problem	1	4	3.49	0.84
Avoiding problems					
1.	I hid the problem I was experiencing	1	5	3.18	1.05
2.	I relieve stress by imagining	1	4	3.64	0.68
3.	I spent more time alone	1	4	3.40	0.84
4.	I watched television more than usual	1	4	2.58	1.03
5.	I avoid others because of the problems I faced	1	4	3.64	0.65
6.	I avoid problems by doing activities that I like	1	4	2.44	1.27
7.	I relieve stress with lots of sleep	1	4	3.09	1.00
8.	I feel that the problem I experienced is not real	1	4	3.42	0.92
9.	I feel that the problem I experienced is the same as a story in a movie or novel	1	4	3.60	0.69
10.	I want others to stay away from me	1	4	3.73	0.72

Effects of self-efficacy on solving problems, seeking support and avoiding problems
Table 4 showed that the mean score of all variables was high, meaning that most participants had high self-efficacy and positive problem-solving and positive support seeking, and less problem avoidance as a coping mechanism. While based on the linear regression, it is shown that there was a significant effect of self-efficacy on these three forms of coping mechanisms. Self-efficacy had an effect of 97.7% on solving problems, 98.3% on seeking support and 98.4% on avoiding problems.

Table 4. Effects of self-efficacy on solving problems, seeking support and avoiding problems (n=45)

Variable	Descriptive Statistics				Self-Efficacy			
	Min	Max	Mean	SD	R	R^2	β	*p-value*
Solving problem	25.00	40.00	34.6	3.8	0.988	0.977	0.937	<0.001
Seeking support	22.00	43.00	31.8	3.7	0.992	0.983	1.251	<0.001
Avoiding problem	26.00	38.00	32.7	3.2	0.992	0.984	0.721	<0.001

DISCUSSION
The present study aimed to determine the effects of self-efficacy on solving problems, seeking support, and avoiding problems as coping mechanisms in cancer patients. Results showed that cancer patients had a high score of self-efficacy, in which they managed and found a way out to solve difficult problems and could adapt to situations. Self-efficacy helps overcome the problems that vary greatly from the consequences of cancer and the effects of treatment (Foster et al., 2015). A similar result also reported

that 112 patients undergoing adjuvant endocrine therapy showed that those with higher self-efficacy were able to overcome physical symptoms of cancer and had a significant relationship related to greater functional, emotional, and social well-being (Shelby et al., 2014). Another study stated there was a positive relationship between self-efficacy and quality of life, the ability to adapt to cancer diagnosis, and reduce the distress of cancer patients (Wang, Liu, Shi, & Wang, 2016). Someone with self-efficacy is more likely to be adaptable and has a high desire to live. The adaptation process of adult cancer patients starts from facing an unknown situation, followed by patients looking for relevant information and decision-making considerations, and also listening to healthcare professionals' suggestions so that the patients get a chance to extend their life and the desire to survive (Chao, Wang, Hsu, & Wang, 2015). Patients who have good self-efficacy will achieve a good quality of life. This was also reported by a study of 100 breast cancer patients that there was a significant relationship between self-efficacy and the quality of life of patients, including physical health, mental health, social relationships and satisfaction with the environment (Moradi et al., 2017).

Another finding of this study showed a significant effect of self-efficacy on solving problems, which means that the participants who are eager to choose solving problems as a coping mechanism to respond to the stressors have an adaptive coping mechanism. This has been seen from the component of solving problems, that the participants were enthusiastic, full of attention, and could plan their actions to solve a problem. This result is supported by another study where patients who have high expectations resulted in the improvement of self-confidence, self-efficacy, and high welfare, and caused patients to have strong support for using strategies to achieve their goals in solving problems (Bahryni, Bermas, & Tashvighi, 2016). A similar result declared that among 121 breast cancer patients undergoing surgery, those who had less emotional distress also had more positive problem-solving (Heppner, Armer, & Mallinckrodt, 2009). Based on the findings of this study, the majority of participants were in the old age (54.1 years), had cancer stage of II and III, and had also been diagnosed with cancer for more than 1 year. All of these participants chose to solve problems with adaptive and positive coping mechanisms. This result is supported by another study where 281 participants with gynecologic cancer having the mean age of 54.8 and in stage II and III of cancer predominantly also had resilience in psychologically adapting, and expressed three types of coping strategies, namely positive emotions, reframing cancer experiences positively, and fostering a sense of peace and meaning in life. This causes a good quality of life (Manne et al., 2015). Another research stated that positive coping was found in women cancer patients undergoing cancer treatment and were diagnosed for cancer for more than 6 months (Kvillemo & Bränström, 2014).

Our findings also showed that self-efficacy affected seeking support. The participants hoped for and received help and support from friends and family in solving the problem. Seeking support is an effort made to seek help from those who are relevant to others to help to solve problems (Zartaloudi & Madianos, 2010). A study reported that patients who had problems were more likely to seek support from parents, friends, partners (Chow & Glaman, 2013). A study conducted for individuals who were depressed and anxious found that 47% sought support from professional experts to help solve their problems (Wallerblad, Möller, & Forsell, 2012). This study found that the majority of

participants had been diagnosed with cancer for more than 1 year and the nuclear family lived with patients to provide support. A study stated that cancer patients who were diagnosed in the first 1-3 years experienced shock disorders such as physical, emotional, social, work, and financial stress, which made them in dire need of support from others (Stanton, 2012). Another study also explained that cancer survivors decided to seek support, especially from family members such as children, parents, siblings and more distant relatives to help them making treatment decisions, emotional support, inspiration, motivation, informational support, and spiritual support, and provide facilities (Muhamad, Afshari, & Kazilan, 2011). A qualitative descriptive study of 14 breast cancer patients stated that family support could increase individual involvement in the fight against cancer (Chung & Hwang, 2012). Seeking support, which is a finding of this research, is also caused by the active involvement of cancer survivors in community activities. The findings in this study are supported by the results of another study, which stated that the majority of cancer patients who were more than 50 years old and were active in online community groups had a better atmosphere and quality of life (van Eenbergen, van de Poll-Franse, Heine, & Mols, 2017). The same results were also presented by a study which stated that the involvement of cancer patients in a support group in online communities could improve the ability to express emotions properly, and was beneficial for improving the health condition of patients (Han et al., 2011). A study explained that breast cancer patients had a high awareness to know more about the disease and its treatment, therefore, the majority of patients visited health professionals to consult their problems (Agbokey et al., 2019).

Participants in this study having low scores on self-efficacy are more likely to choose to avoid problems as an alternative coping mechanism. Avoiding as coping is a form of individual behavior that seeks to avoid, deny, ignore and not solve problems properly which causes the individual to be in a stressful situation (Holahan, Moos, Holahan, Brennan, & Schutte, 2005). A study of 97 gynecological cancer stated that patients who lacked self-confidence and were pessimistic had a significant association with the onset of anxiety and depression (Zenger, Glaesmer, Hockel, & Hinz, 2011). Older people who are diagnosed with cancer are more anxious. It is supported by a study reporting that for patients diagnosed with cancer in late adulthood, 20% of them tend to report prolonged anxiety (Mitchell, Ferguson, Gill, Paul, & Symonds, 2013). Prolonged anxiety can cause an individual to feel hopeless; the hopelessness is related to cancer-related concerns, such as feeling different from others and feelings of alienation. Together, this can affect a patient's subjective responses, such as helpless responses, difficulty in resolving problems and affective disorders, and also poor general well-being (Grassi et al., 2010). Breast cancer patients experiencing a recurrence in four months after diagnosis reported feeling hopeless, feeling alone, and are very vulnerable to depression (Brothers & Andersen, 2009). Cancer patients experiencing anxiety and depression at moderate levels are more likely to have coping strategies to avoid problems (Karabulutlu, Bilici, Çayır, Tekin, & Kantarcı, 2010). Avoiding problems is one of the maladaptive coping mechanisms. Cancer patients experiencing excessive stress will perform maladaptive coping mechanisms, and use of maladaptive coping will further increase their psychological pressure and reduce their quality of life (Ravindran, Shankar, & Murthy, 2019). A study of 346 patients undergoing palliative care with complex physical symptoms found that they had major coping strategies that focused on

emotions, such as cognitive avoidance and fatalism; this selection of coping was influenced by socio-demographic variables and disease (Pereira & de Brito Santos, 2016). The similarity in results was also reported in study where 22 patients of breast cancer that received adjuvant therapy felt emotional encounters, isolationism, fatalism, feeling guilt and blaming others, and also avoided the problems, such as avoided threatening and unpleasant thoughts (Hajian, Mehrabi, Simbar, & Houshyari, 2017).

This study has limitations. The participants in this study were cancer patients with all stages and types of cancer, and therefore, which might influence the patients' responses to their condition. This study was also conducted with small sample size. Despite the limitations, this study could describe the self-efficacy and coping mechanisms of cancer patients.

CONCLUSION
The results of the study showed that self-efficacy affects the coping mechanism, where individuals who have positive self-efficacy will choose to solve problems and seek support as their coping mechanisms, while individuals with negative self-efficacy tend to choose to avoid the problem. The findings of this study are important to provide positive support to patients to increase self-efficacy, to be able to choose adaptive coping. Based on the finding of this study, it is recommended to explore the internal and external motivation of cancer patients to choose coping mechanisms in future studies.

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CONFLICT OF INTEREST
The authors declare no conflict of interest.

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Students' Views of Classroom Debates as a Strategy to Enhance Critical Thinking and Oral Communication Skills

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ABSTRACT

Background: The skills in effective communication and critical thinking are essential for nurses to apply appropriate judgments in the delivery of patient care. Classroom debates are evident to be an effective strategy that can be used to improve such skills. Unfortunately, research focusing on classroom debates to promote critical thinking and oral communication skills among nursing students has not been extensively explored.
Purpose: This study aimed to explore nursing students' views of classroom debates as a learning strategy to enhance critical thinking and oral communication skills.
Methods: A descriptive qualitative research design was employed in this study. Twelve students of the undergraduate program in nursing with classroom debate experiences and willingness to participate were purposively recruited for semi-structured interviews. Open-ended questions were used, and probing questions were also generated from the participants to get more detailed information. The interviews were transcribed verbatim and analyzed using the inductive content analysis.
Results: The results of the study identified five themes, including the acquisition of new knowledge, awareness and responsiveness to diverse viewpoints and arguments, learning structuring ideas and appropriate ways of presentation, development of other necessary skills, and challenges of classroom debates in nursing education.
Conclusion: Classroom debates promoted the development of critical thinking and oral communication skills, and offered students an opportunity to develop other necessary skills in the face of today's complex healthcare. Classroom debates can be integrated into the curriculum and teaching practices of any nursing educational institutions.

Keywords: Classroom debates; critical thinking; nurse education; oral communication skill; students' views

BACKGROUND

In the face of today's complex healthcare system, all graduates of healthcare studies, including nursing, should be prepared to think critically and communicate effectively (Hall, 2011). The skills in effective communication and critical thinking are considered essential for nurses (Ralph & Moloney, 2015) in order to apply appropriate knowledge and skilled judgments in providing care to patients (Khosravani, Manoochehri, & Memarian, 2004). Recent changes and demands in the healthcare service also require the need for critical thinking to help healthcare workers provide excellent services (Ang, Chew, Sum, Sengupta, & Sim, 2019). The importance of critical thinking in nursing is so evident that many educational programs evaluate their goal achievements according to the development of critical thinking (Khosravani et al., 2004).

Critical thinking is associated with a purposeful judgment that results in interpretation, analysis, evaluation, and inference (Hajrezayi, Roshani, Shahalizade, Zeynali, & Badali, 2015). It involves a set of skills, such as analyzing, arguing, synthesizing, evaluating, and applying as well as the use of these skills to guide behaviors (Wang, Woo, & Zhao, 2009). Critical thinking is an essential skill that affects the entire spectrum of nursing practice; the higher the critical thinking ability is, the better the nursing competence will be (Shoulders, Follett, & Eason, 2014). The development of critical thinking has been a focus of many educators at every level of education, and becomes an essential goal of education in many societies around the world, as it promotes such disparate qualities as democracy and personal development (Larsson, 2017). Nursing faculties generally agree that students who know how to think to make better clinical judgments than those who have merely memorized facts (Khosravani et al., 2004). Therefore, nurse educators should implement new strategies to encourage active learning and enhance critical thinking skills in students.

In addition to critical thinking, effective skills in oral communication are also essential for nurses and become the heart of quality healthcare (Ralph & Moloney, 2015). Nurses and healthcare providers should have the ability to communicate effectively, not only to patients but also to other constituents, such as doctors, pharmacists, and policymakers, to protect and advance their profession (Hall, 2011). Effective communication between nurses and patients plays a significant role in the outcome of individualized nursing care that is provided to patients (Kourkouta & Papathanasiou, 2014), helps nurses gather information from patients, and assists patients cope with their situation, as well as to speak up in difficult situations (Bosher, 2013). The application of effective strategies of communication by nurses may reduce stress, promote wellness, and, therefore, improve the overall quality of life (Vertino, 2014).

To help students increase critical thinking and oral communication skills, nursing schools and faculties adopt various teaching strategies and innovations which actively engage students in the learning process (Popil, 2011). Active learning, in this regard, differs from passive learning as the former involves complex thinking processes and improves retention, assimilation, understanding, and appropriate application of course content (Alén, Domínguez, & de Carlos, 2015). Through active learning strategy, it is expected that students can actively devote and engage themselves in learning process and develop necessary skills as an individual and as a team member.

One of the active learning strategies that can be applied in nursing education is debates. Research shows that debates are a pedagogical method that can be applied to promote critical thinking and oral communication skills among students (Doody & Condon, 2012; Hartin, Birks, Bodak, Woods, & Hitchins, 2017). Debates foster self-directed learning, participation in a shared dialogue, and teamwork (Nisly, Kingdon, Janzen, & Dy-Boarman, 2017). Debates allow students to develop knowledge of substantive topics and exercise skills through practice activities (Doody & Condon, 2012; Hartin et al., 2017) and offer the participants the ability to explore a topic in more than one correct stance. Furthermore, debates promote students' use of the available evidence to support a stance and communicate a stance to other participants with differing opinions persuasively and professionally (Nisly et al., 2017), as well as increase students' active learning by giving them the responsibility to understand learning materials, which can transform their perspective from passive to active (Rodger & Stewart-Lord, 2020). One form of debates that are conducted in the classroom are known as classroom debates.

Classroom debates are usually practiced by splitting students in a classroom into two groups; one is the pro side and the other is the con side of the topic/motion (Rodger & Stewart-Lord, 2020). The motion can be determined by the instructors based on the materials that students learn. The two groups, which consist of two or more speakers, will speak out their arguments and oppose the opponent's arguments about the topic (Iman, 2017). The remaining students in the classroom can act as the juries, observers, or other necessary roles. Before debate practice, students are usually given time to research the topic by reading reliable papers, books, articles, and other types of resources to help them develop and organize their thoughts about the motion to produce informed arguments. When the preparation is completed, students will present the debate by delivering their arguments in turns, starting from the pro to the con sides within an allocated time. There is also a Point of Information (POI), a formal question addressed by a member of the opposing team during a debate (D'Cruz, 2003). The brainstorming sessions before the debate, the presentation of team arguments, and discussion during the debate among team members are parts of debate activities that can promote critical thinking and oral communication skills (Othman, Sahamid, Zulkefli, Hashim, & Mohamad, 2015), as well as opportunities to challenge and rebut claims and assertions following an opponent's opening statement and main arguments (Rodger & Stewart-Lord, 2020).

Previous studies reported positive feedbacks of classroom debates in various disciplines such as tourism (Alén et al., 2015), pharmacy (Hanna et al., 2014; Hogan & Dunne, 2018; Toor, Smai, & Wargo, 2017; Peasah & Marshall, 2017), medicine (Mumtaz & Latif, 2017; Shaw, 2012), nursing (Hartin et al., 2017; Kim & Park, 2019), childhood studies (Brown, 2015), and Teaching English as a Second language (TESL) (Zare & Othman, 2015; Othman et al., 2015). Alén et al. (2015) revealed that academic debates helped tourism students develop diverse and relevant learning and critical thinking through active learning. Debates gave positive effects on increased confidence and enjoyment (Toor et al., 2017), mastery of materials (Peasah & Marshall, 2017), development of teamwork, peer assessment, communication and critical evaluation among pharmacy students (Hanna et al., 2014). In addition to critical thinking and oral communication, debates also promoted English as a Second Language (ESL) students'

mastery of learning materials and teamwork (Zare & Othman, 2015). In the medical context, debates gave students experience in increasing communication skills (Shaw, 2012), critical thinking, and analytical decision making (Mumtaz & Latif, 2017), as well as confidence and leadership (Rodger & Stewart-Lord, 2020). Debates also increased the acquisition of skills in communication, team building, and the implementation of these skills in practice among nursing students (Hartin et al., 2017).

Although literature indicated that debate is an effective strategy for improving critical thinking and communication skills among nursing students, there has been no adequate evidence from the perspective of students to support this assertion (Hartin et al., 2017). Furthermore, in recent years, few studies have focused on the results of studies conducted on classroom debates. In Indonesia, where this study took place, the evidence of the use of debates to increase critical thinking and communication skills among nursing students is scarcely found. There is a necessity to conduct a study on how nursing students viewed classroom debates in nursing education to promote critical thinking and oral communication.

PURPOSE
This study aimed to explore nursing students' views of classroom debates as a learning strategy to enhance critical thinking and oral communication skills.

METHODS
Research design and participants
The present study used a descriptive qualitative research design to explore how nursing students viewed classroom debates to enhance critical thinking and oral communication skills. Twelve undergraduate nursing students being in the second to the fourth year of their study, having classroom debate experiences, and showing a willingness to participate in the study were purposively recruited for semi-structured interviews. Open-ended questions were used, and probing questions were also generated from the participants to get more detailed information.

Data collection
Semi-structured interviews were conducted to get qualitative data from the participants. Participant observations and field notes were also done to support the collected data. The interviews were conducted at an agreed time between the students and the researchers at the school premises in 2019. The structured questions in this study were developed by the researchers and validated by panel judgment. The questions were focused on how students viewed classroom debates as a strategy to enhance critical thinking and oral communication skills, and whether they had benefited from debate activities. The interview was individually conducted and audio-taped with approval from the student. Each interview lasted with a duration of 30 to 40 minutes.

Data analysis
The interviews were transcribed verbatim and analyzed using the inductive content analysis summarized by Elo and Kyngas (2008). The process of analysis in this study included selecting units of analysis, making sense of the data, and learning 'what is

going on' to obtain a sense of the whole, open coding, creating categories, and abstraction.

The trustworthiness of the study

In this study, trustworthiness was achieved by four strategies, including triangulation, peer-debriefing, member checking, and appropriate interpretation (Krefting, 1991). Triangulation is the solicitation of data from multiple sources to cross-check and corroborate the evidence that sheds light on the theme. In this study, triangulation was conducted by interviews of various students with different backgrounds and the use of field notes and observations during interviews. Member checking was performed by inviting participants to provide their views and feedback on the resulted themes. Peer-debriefing was performed by the researchers to gain consensus among the researchers on data analysis. An appropriate interpretation was made by the researchers based on the collected data and relevant literature. As suggested by Creswell (2012), this study also employed an external audit in which the researchers sought an expert to review different aspects of the research to confirm the accuracy of the findings and to ensure the findings are supported by the collected data.

Ethical considerations

Administrative clearance from the head of the school where this study took place was secured before the study. A complete explanation and description of the purpose of the study, methods, potential risks, and benefits were given to all participants. The participants were also free to ask questions, refuse/accept participation in this study, and withdraw at any time without negative consequences. Informed consent was obtained from each participant before data collection. All collected data remained confidential, and access was limited only to the researchers.

RESULTS

Characteristics of participants

The participants of this study were undergraduate nursing students. The results showed that a majority of participants were females (91.67%) and with the age of 20 to 24 years old (*M*=22.20). A majority of the participants (60%) had the experience of debate activities for 5-6 years that they obtained either in high schools or colleges. Most of the participants were the third-year students (50%); the remaining were the second (30%) and fourth-year students (20%).

Findings from the interview data

The findings of the interviews revealed the students' views of classroom debates as a learning strategy to promote critical thinking and oral communication skills. Five general themes were developed, including the acquisition of new knowledge and ideas, awareness and responsiveness to diverse viewpoints and arguments, learning to structure ideas and appropriate ways of presentation, development of other necessary skills, and challenges of classroom debate implementation in nursing education. Some of the participants' statements were quoted below, and their identities were anonymized by a number to ensure confidentiality.

Acquisition of new knowledge and ideas

The participants in this study reported that debates helped them develop new knowledge and ideas. Debates demanded students to engage with the subject or topic – also known as motion – during the debate preparation and presentation. All students agreed that they have to research in preparation for the debate. Once they were informed of the topic of debate, students would mostly read papers, books, articles, and other types of resources on the internet and make a summary of arguments about it, both for the pro and cons positions. Students perceived that this process assisted them develop, organize, and formulate their thoughts to produce informed arguments. Students would perform well in the debate when they have sufficient knowledge of the topic.

> "We have to search and browse materials for the debate during the preparation stage. We read a lot of articles and papers which are relevant to the motion. Mostly we obtain new information or evidence that helps us construct our arguments. That really helps broaden our knowledge." (P2)
>
> "… when we are debating, we are demanded to have the ability to think actively from the process of searching information, looking for data or evidence, developing and strengthening our arguments. We need to research the topic in order to master the topic and determine the standing point when we are faced with the position of pros or cons." (P5)

Students reported that they would be able to deliver fluent arguments and comment on or criticize the opponent's arguments only if the topic was of their mastery. In debate preparation, the information that students obtained from research and readings could be combined and summarized in such a way to form the basis of their arguments. The students' critical thinking is promoted as they have to analyze obtained information, develop counter-arguments, and respond to critical questions from their opponents. In this sense, having comprehensive knowledge and understanding of the motion would significantly contribute to the students' achievement at this level.

> "We, as debaters, are required to provide the best solution of the motion given so that we need to prepare materials and arguments that are rational, specific, and can counter the opponent's opinions. Personally, when I master the topic, I find it easier to criticize and counter opposing arguments" (P1)
>
> "If you are participating in a debate, you will be assigned a certain topic. Sometimes the topic is beyond your expectation, and therefore you need to read a lot, especially when the topics are not familiar. If you read a lot, you know a lot (about the topic), and so you will be able to give your views or ideas fluently to counter the opposing arguments." (P10)

Awareness and responsiveness to diverse viewpoints and arguments

This theme describes how debates assisted students consider great varieties or diverse viewpoints and arguments that they found in the literature. Before a debate presentation, students would usually be given time to explore the topic as an individual speaker or a team member. Whether they were to be in the pro or cons side was not determined before a debate practice, and therefore, students had to explore both pro and con sides of the motion. This exploration would encourage students to engage with numerous ideas

and arguments in the literature. They learned to be aware and alert that there are a lot of possible arguments that could strengthen or weaken a particular position. They learned to anticipate and predict what would be going on in the debate with those sorts of arguments. Awareness of diverse viewpoints and arguments are guaranteed.

> "… In debates, we are faced with different opinions or dealing with people who have different arguments. So we learn to consider these differences. When we are preparing the debate, we also find a lot of information and evidence that can be used to defend or attack our position. So, debates teach us to develop an understanding of different perspectives." (P5)
>
> "In practicing debates, a debater should be able to see diverse viewpoints. Every debater has different arguments as a result of research that they conducted, and so does the opposing team. They have arguments that will be different from ours. So, what we need to do is to have broad knowledge and anticipate all possibilities to produce strong arguments" (P11).

In a debate presentation, students also learn to be critical thinkers and presenters by being responsive and alert to the opponent's attacking arguments. They need to analyze and think fast to respond to any opposing arguments. In order to do so, students need to think critically with the support of data they had gained before the debate. Furthermore, they need to pay attention to detailed information that can be their counter-arguments or POIs for the opponents.

> "… there is a reciprocal interaction between debate teams, the pro, and the cons. We have to carefully listen to the opponent's arguments and quickly make a POI (point of interruption) when something is missing or going wrong. It is a quick process. We have to comprehend information, opposing arguments and strengthen our arguments" (P6)
>
> "In a debate, students must be able to think fast, even in conditions where the arguments are not by their own beliefs. Nevertheless, they must convince the judges, especially when we have to respond and attack the arguments of the opposing team." (P3).
>
> "In a debate, we should not argue based on our assumptions, but on evidence. We must defend our arguments with our best effort. In this case, we have to be skillful in analyzing the situation and providing credible information to oppose the other team." (P9)

Learning structuring ideas and appropriate ways of presentation
This theme describes students' views on how classroom debates promoted learning of structuring ideas and appropriate ways of presentation, affecting increased skills of critical thinking and communication. Students perceived that debates pushed them to keep the original problem in mind, stick to the point, and provide a clear explanation or elaboration with specific details. That meant students had to arrange their arguments in such a systematic way that is easy to follow and understand, not only to the opponents but also to judges and audience.

> "In debates, there is a time limit for speaking or presenting arguments. For example, a first speaker/debater may be given 7 minutes. In this case, the debater needs to arrange the sentences of his arguments so that they are easy to understand and have clear points. In debates, we are not just talking fast, but there must also be an emphasis on points that are considered important. This trains my speaking ability." (P1)
>
> "I also learn how to speak appropriately so that the idea of my speech is accepted and understood by the people who are listening." (P5)

The participants in this study also believed that debates trained their brains to systematic thinking and mind and control of their body language, voice, and eye contact. To ensure the audience of their presented arguments, the students should speak dynamically with precise intonation and articulation, as well as suitable pauses and emphasis. They should know when they have to speak fast or slowly, and it is all depending on their purpose and debate circumstances.

> "Debates also train the brain to think systematically, which means looking at a topic from various points of view in order to produce the right output. Debates also improve communication skills because, in debates, a person can learn to communicate thoughts in a coherent and detailed form so that the recipient of the message understands the rationale of what is communicated." (P10).
>
> "The way we speak, the pace, intonation, articulation, gesture, and eye contacts are certainly needed to help convince the jury or audience. I believe debates help me a lot to achieve those things." (P2)

Development of other necessary skills

The participants also reported that classroom debates promoted the development of other necessary soft skills in support of critical thinking and oral communication. Most students reported debates helped them increase confidence, and learn to appreciate others even if they were in the opposite position.

> "Yes, I felt really nervous and hesitant to do a debate for the first time. After some practice, I felt that my confidence develops." (P2)
>
> "Yes, debates help us learn how to respect and appreciate other people's arguments." (P4)
>
> "In a debate, we mostly disagree with the opponent's arguments, but we have to keep in mind that these opposing arguments should be appreciated." (P8)
>
> "This debate teaches me how to respect other people and opinions, and even they are in opposition with us." (P3)

The students also stated they usually cooperated with their teammates to discuss and construct arguments for their team. In the preparation stage, they commented on each other drafts of arguments to seek the best ones. During the debate, students also worked together to criticize the opponent and defend their arguments, as well as showed signals when allocated time for a speech was over.

"Debates also promote teamwork because when we are in a debate team, we need to communicate with each other as team members for what to prepare in the presentation. It is important so that the team has coherent arguments." (12)

"Debates increased my skills in collaborating with others." (P5)

"This activity (debate) teaches me how to work with other members of the team, for example, during case-building (preparation) or presentation of the arguments." (P1)

Challenges of classroom debates in nursing education

The participants reported that although classroom debates could promote critical thinking and oral communication skills, there were challenging issues when debates are implemented as a learning strategy. A majority of students perceived that debate technicality and preparation time were some issues that should be taken into account in implementing classroom debates. To practice a good debate, students should understand debate technicality and rules so that they know and understand their duties as a team member. Understanding debate technicality was deemed essential for the students to demonstrate quality debate. Some students also mentioned that they needed more time in preparation so that they had more opportunities to structure arguments, and therefore, their presentation could be easily understood by the audiences.

"I think one of the issues in implementing classroom debates is the preparation time. When I practiced debates with my team, we need a long time for preparation (case-building). Sometimes, we are given thirty minutes, but we think it is not enough. We are not yet done with structuring the arguments, but the time is running out." (P3)

"The preparation time should be considered. We cannot prepare our arguments well if the time is limited. So in the past, my teachers gave the topic of the debate in advance before we practiced it" (P5)

"I think, when we want to use debates in the classroom, we have to ensure that all students are familiar with that. If not, they may not be able to follow the activity well. So students need to be exposed to the rules and technicality of debates, and that is important for teachers." (P7)

Another issue of classroom debate was related to motions. Some students mentioned that sometimes they were faced with such a problematic motion to debate. They argued that the motions should be adjusted to their level of knowledge; it should not be too easy or complicated and should be well formulated in accordance to debate rules.

"Sometimes, I find it difficult to understand the motion; it can be because of my capacity, or the topic is just too difficult for me." (P8)

"The motion should be adjusted to the level of our knowledge. Before the debate begins, it should be ensured that all students share the same perception of the topic. Otherwise, they will have difficult times and will not be able to perform optimally in the debate." (P3)

In general, the results of interviews illustrate that the students in this study consistently perceived the benefits of classroom debates to enhance critical thinking and oral communication skills mostly.

DISCUSSION

The present study aimed to explore how nursing students viewed classroom debates as a learning strategy to enhance critical thinking and oral communication skills. Results from qualitative findings showed that the students positively perceived classroom debates concerning their increased critical thinking and oral communication skills. Not only that, but students also believed that classroom debates promoted teamwork skills, confidence, respect to others, and other essential attributes for nurses.

The finding of this study showed that debates help students develop new knowledge and ideas, leading to the promotion of critical thinking and oral communication skills. This finding confirms some of the previous studies on debates (Aclan & Aziz, 2015; Iman, 2017; Peasah & Marshall, 2017; Rodger & Stewart-Lord, 2020; Scott, 2008). Debates demand students to engage with the topics as they have to research debate preparation. Students would mostly read reliable papers, journals, or reports for their references. This process helps students develop and formulate their thoughts about the motion to produce informed arguments. In preparation, the information that students obtain from research and reading could be combined and summarized in such a way to form the basis of their arguments. The skill of critical thinking is, therefore, promoted as they have to analyze the obtained information and develop counter-arguments to their opponents (Rodger & Stewart-Lord, 2020). Having brainstorming and discussion sessions of newly gained knowledge among group members during preparation before a debate activity was evident to encourage the development of critical thinking among students (Mumtaz & Latif, 2017; Othman et al., 2015). Furthermore, the acquisition of new knowledge and ideas will also affect students' oral communication skills as they would be able to deliver fluent arguments and comment on or criticize the opponent's arguments only if the topic is of their mastery. Students would perform well in the debate when they have sufficient knowledge of the topic.

Classroom debates were also evident in this study to promote students' awareness and responsiveness to diverse viewpoints and arguments that affect their ability to think. It is congruent with a majority of previous studies (Brown, 2015; Hanna et al., 2014; Khosravani et al., 2004; Mumtaz & Latif, 2017; Zare & Othman, 2015), reporting that students involved in debates would learn to consider and understand different perspectives, learn to use evidence to support arguments and viewpoints, as well as be open-minded and accept reasonable criticisms which are keys to critical thinking (Zare & Othman, 2015). Before a debate presentation, students would usually be given time to explore the topic/motion for both its pros and cons sides. This exploration encourages students to engage with numerous ideas and arguments in the literature. They can learn to anticipate and predict what will be going on in the debate if those sorts of arguments are employed. Through debates, students also learn to examine issues in-depth, consider contrasting viewpoints, and defend a position that leads to critical thinking (Alén et al., 2015). Debate activities also allow students to identify an issue that should be resolved and demonstrate a comprehensive analysis of the issue, including appraisal, critique,

and reasoning of the issue for potential solution. Such skills are important as healthcare professionals are frequently faced with new evidence, and the only way to distinguish the valid from the invalid is to appraise and critique the evidence (Hall, 2011). Debates promote critical thinking as these activities require the students to synthesize, analyze, and evaluate arguments (Zare & Othman, 2015). In debates, students are encouraged to interact and be involved in the selected topics, enabling students to recognize that the debate is an exploration of issues relevant to their professional role (Hartin et al., 2017).

This study also showed that critical thinking and oral communication were promoted through classroom debates where the students learned to develop structured ideas and appropriate attributes of presentation, such as voice, gesture, and eye contact. Debates make students learn to arrange arguments in such a way that is easy to follow and understand, not only to their peers and opponents but also to judges and audience. As reported in previous research, students have to use evidence and consider viewpoints to support their arguments in a well-organized and persuasive manner, as well as in responding to the opposition (Koklanaris et al., 2008). To present structured arguments, students need extensive research to formulate convincing arguments and substantiate them with evidence (Ang et al., 2019). Through such activities, the students' critical thinking is promoted. The skill of oral communication in this study is promoted by debates as reported in some previous studies (Hall, 2011; Hartin, 2017; Mumtaz & Latif, 2017; Nisly et al., 2017; Shaw, 2012; Zare & Othman, 2015). The skill of effective communication represents the heart of quality healthcare (Ralph & Moloney, 2015), affecting the success of the outcome of nursing care for patients (Kourkouta & Papathanasiou, 2014). In debates, students are required to use verbal communication to convince the audience and adjudicators using a well-planned analysis of the arguments that support and refute their point of views (Shaw, 2012) and control of body language, speech, and eye contacts in the delivery of arguments (D'Cruz, 2003). Students also have opportunities to articulate their thoughts based on evidence (Mumtaz & Latif, 2017) and rebut the opponent's arguments. Furthermore, the students should also defend their points of view and directly respond to the questions that they are asked (Alén et al., 2015). Debates demand students to communicate their argument in a persuasive manner (Dy-Boarmana, Nisly, & Costello, 2018; Kim & Park, 2019). Such situations require the students to have confidence to talk in front of the public, and debates promote students' confidence to alleviate their fear of speaking in front of people (Zare & Othman, 2015).

The result of this study also showed that classroom debates promoted the development of other necessary skills in support of critical thinking and oral communication, such as confidence, teamwork, and appreciation or respect to others. A study by Mumtaz and Latif (2017) reported that debates increased skills of tolerance towards diverse ideas and respecting others' opinions. The sense of respect within the students develops as the students are faced with several opposing arguments from the opponent's team. Debates allow the students not only to know that an issue needs to be solved, but also to show a more in-depth analysis of the issue, including appraisal, critique, and reasoning for a potential solution (Hall, 2011). In debate presentation, debaters have to talk to and work with each other to make sure that their ideas are coherent. Thus, the skill of teamwork is promoted. If they lack this critical skill, they might have incoherent arguments during debates (Aclan & Aziz, 2015). Debates also encourage students to support each other as

team members to raise confidence. The confidence that indicates the ability to present oneself and ideas appropriately is promoted as students participating in debates have to do many things they may not do in a common discussion. Students will need to be able to think critically about issues to present relevant arguments. They also need to have the ability to express thoughts in a way that is understood by audience (Pulver, 2018).

A classroom debate is an interesting learning strategy that can engage students in an active teaching and learning process. However, some challenging issues or problems in its implementation might be encountered as found in this study. A majority of students perceived that debate technicality, preparation time, and motion selection were examples of issues that should be taken into account in classroom debates. Similar challenges are also reported in a study by Zare and Othman (2015). To demonstrate a good debate, students should understand its technicality and rules so that they know their duties as a team member and understand what and how they have to speak the arguments. Understanding debate technicality is important for students to demonstrate quality debate. Similarly, motions of debates should also be adjusted to students' level of knowledge; they should not be too easy or too complicated and should be formulated (D'Cruz, 2003). The topic of debate affects how students are involved in debates. As a teaching method, debates allow students to practice and cultivate communication and skills in solving problems that assist the achievement of competencies. Therefore, regardless of potential challenging issues in debates, teachers at educational institutions should consider this as a potential teaching strategy (McGeea, Pius, & Mukherjee, 2020).

Considering the results of this study, it is believed that classroom debates offer the students a valuable opportunity to develop critical thinking and oral communication abilities, as well as other necessary skills to face today's healthcare system. Critical thinking is associated with nurse performance (Suangga & Tuppal, 2017). Previous research reported that problem-based learning was the strategy that is mostly used to promote critical thinking in an undergraduate nursing course (Carvalho et al., 2017) and encourage students as self-directed learners (Kong, Qin, Zhou, Moub, & Gao, 2014). As critical and analytic skills are not naturally present in college students, it is necessary to involve higher-order thinking activities, such as debates, to instill these skills (Yang & Rusli, 2012). Debates can be used as an alternative to teaching and learning strategies and incorporated into the course curriculum. Furthermore, debates are scalable that they can be used without restriction to the mode of delivery, such as in face-to-face, online, or blended courses (Park, Kier, & Jugdev, 2011). Debates can also be integrated with other active learning strategies such as problem-based learning, mind mapping, and collaborative learning.

CONCLUSION
This study revealed the positive views of nursing students towards classroom debates. The students perceived that classroom debates mostly enhanced their critical thinking and oral communication skills. Classroom debates also offered the students a valuable opportunity to develop other necessary skills for nursing students in the face of today's complex healthcare system, such as confidence, teamwork skills, and respect for others. Debate rules and technicalities, preparation time, and motion selection are challenging

issues in the implementation of classroom debates in nursing education that should be taken into account by nurse educators.

Considering the results of the study, it is recommended that in order to prepare nursing graduates with effective communication and critical thinking skills, the schools should consider and incorporate the use of classroom debates in their curriculum and teaching practices. Evidence on the use of classroom debates among nursing students is scarcely found, and therefore, this study might be a valuable reference for any nursing schools to increase their teaching practices. Further research using a quantitative approach may be conducted to investigate the effects of classroom debates on nursing students' technical and non-technical skills.

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CONFLICT OF INTEREST
The authors declare no conflict of interest.

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Effects of Mindfulness on Stimulating Hope and Recovery among People with Schizophrenia

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ABSTRACT

Background: Hope has an essential role in the recovery journey for people with schizophrenia. Current studies showed that people with schizophrenia reported having low hope. There is growing evidence that mindfulness has favorable effects on mental health in populations with chronic illness, including people with schizophrenia. However, the studies evaluating effects of mindfulness on hope and recovery for people with schizophrenia are limited.

Purpose: This study aimed to examine the effects of mindfulness on hope and recovery among people with schizophrenia.

Methods: This quasi-experimental study was carried out on 54 patients with schizophrenia based on purposive sampling in a psychiatric hospital in Indonesia. The respondents were divided into two groups with 27 patients each in the intervention and the control group. The intervention group received 2-session mindfulness, while the control group received standard care. The data were collected using the demographic questionnaire, the Schizophrenia Hope Scale (SHS-9), and Recovery Assessment Scale (RAS), and analyzed using the Chi-Square and Mann-Whitney tests.

Results: After mindfulness therapy, the intervention group showed a higher mean score of hope than the control group (14.30±2.50 and 9.04±2.15, respectively) as well as in the mean of recovery (86.78±4.00 and 73.56±6.04, respectively). There were significant differences in hope and recovery levels between the two groups with p-value <0.001.

Conclusion: This study showed that mindfulness is an effective strategy to stimulate hope and recovery among people with schizophrenia. Nurses can apply mindfulness as one of the nursing interventions for helping the recovery process among this population.

Keywords: Hope; mindfulness; recovery; schizophrenia

BACKGROUND

Schizophrenia is one of the chronic brain disorders. This illness could manifest through several symptoms, such as hallucinations, delusions, difficulty in thinking and concentrating, and lack of motivation (Parekh, 2017). Schizophrenia affects at least 24 million people around the globe and commonly occurs in ages between 15 and 35 years old (World Health Organization, 2018). Studies show that males are more likely to be affected by this disorder when compared to females (Falkenburg & Tracy, 2014).

People with schizophrenia tend to experience stigma and discrimination that influence their hope during recovery. Recovery is an ongoing process of change that enables individuals to improve their health, well-being, and live independently along the journey of reaching their potential (Substance Abuse and Mental Health Services Administration [SAMHSA], 2012). Many factors influence individuals' recovery, and one of them is hope, which is mentioned to speed up the process for change, and playing a role in influencing other factors (Acharya & Agius, 2017).

Hope is described as the individual ability in obtaining ideas and driving oneself to achieve the goals (Snyder, 2002). Hope is also found to be a protective factor of attempted suicide among psychotic patients (Libman-Sokolowska & Nasierowski, 2013) and has a positive correlation with functional recovery (Coşkun & Altun, 2017). However, previous studies reported that people with schizophrenia showed a lower level of hope when compared to a healthy population (Coşkun & Altun, 2017; Hayes, 2014). Hence, this condition could contribute to depression (Sari, Dwidiyanti, Wijayanti, & Sarjana, 2017) and lower the quality of life (Vrbova et al., 2017).

Previous studies suggested hope-promoting interventions and psychological counseling services to increase the level of hope among people with schizophrenia. Mindfulness-based intervention is known to promote well-being by reducing behavioral inhibition, increasing adaptive emotion regulation, and providing detachment from dysfunctional attitudes (Ganguly, 2018). Several studies showed the positive impacts of mindfulness-based therapy on schizophrenia, such as increasing positive outcomes, psychosocial functioning, awareness of the illness, the need for treatment (Chien & Thompson, 2014), and lowering the level of negative symptoms (Lee, 2019). Furthermore, meta-analysis studies also showed the significant effect of mindfulness for people with schizophrenia in promoting recovery, including reduces stress, depression (Khoury et al., 2013; Louise, Fitzpatrick, Strauss, Rossell, & Thomas, 2018), as well as increasing functional recovery (Yılmaz & Okanlı, 2017).

Even though evidence showed that mindfulness is an effective strategy for people with schizophrenia, such study is rarely implemented in Indonesia. A recent study showed that mindfulness can reduce the anxiety level among nursing students (Munif, Poeranto, & Utami, 2019). Another study indicated that mindfulness therapy could reduce the risk of violence and control the emotion among patients with schizophrenia (Sari & Dwidiyanti, 2014). However, this previous study was only a case study which could not explore the effectiveness of the intervention; and therefore, had not investigated the application of mindfulness therapy to enhance hope and recovery yet.

PURPOSE
This study aimed to investigate the effects of mindfulness on hope and recovery among people with schizophrenia.

METHODS
Design and samples
This quasi-experimental study was conducted among people with schizophrenia in a psychiatric hospital in Central Java Province, Indonesia using the pre-test and post-test control group design. The respondents were recruited through random sampling. A total of 54 patients determined based on medium effect size were assigned into the control group (n=27) and the intervention group (n=27). The inclusion criteria of respondents were (1) aged more than 18 years old, (2) had no verbal impairment, (3) voluntarily took part in the study, and (4) able to participate from the beginning until the end of the study. The respondents who were discharged, being uncooperative, and experienced delusion and relapse during the study were excluded.

Research instrument and data collection
The data were collected in May 2018 using the socio-demographic questionnaire, the Schizophrenia Hope Scale-9 (SHS-9), and the Recovery Assessment Scale (RAS). The socio-demographic questionnaire was used to report the respondents' characteristics. The SHS-9 questionnaire was originally in English and developed by Choe (2014). The Indonesian version of this instrument in this study showed r=0.04 and alpha coefficient of 0.75, and was used to assess positive hopes of the future, patients' confidence in the present moment and the future, and their value in life. The Likert scales from 0 (disagree) to 2 (strongly agree) were utilized. The total score ranged from 0 to 18, in which a higher score indicated a higher level of hope.

The 20-items of RAS questionnaire was developed by Hancock, Scanlan, Honey, Bundy, and O'Shea (2015), and was already translated into Bahasa Indonesia by Nada, Kusumawardhani, Wiguna, and Elvira (2018). This instrument was used to test recovery based on patients' evaluation and scored using Likert Scales, ranging from score 1 (strongly disagree) to score 5 (strongly agree). The total score ranged from 20 to 100 where higher scores indicated better personal recovery. The Indonesian version of SHS-9 in this study showed r=0.000 and alpha coefficient of 0.76.

Intervention
The intervention in this study was a group-based mindfulness therapy. Participants received two sessions of mindfulness therapy for roughly 30 minutes. The intervention included relaxation or calming technique – deep breathing, in which participants were encouraged to be relaxed; self-awareness – to be aware of their surroundings including time, place, and the reason why they were hospitalized; self-compassion – to reduce the negative self-judgment; and acceptance – to accept their current condition including the illness and believe that God could take away the illness. The sessions took place once a week. The brief intervention was conducted because the length of stay in a psychiatric hospital in Indonesia is approximately three weeks. Therefore, the patients' eligibility and baseline data were checked in the first week. The intervention was delivered in the second and third week followed by the data collection after the therapy. The participants

both in the intervention group and the control group also obtained standard care to patients in the psychiatric hospital.

Data analysis
Descriptive statistics, such as frequency and percentage of each group were compared, and the Chi-Square test was performed to test the group difference in the baseline characteristics, while the Mann-Whitney test was conducted to analyze the effects of mindfulness on stimulating hope and recovery among people with schizophrenia. The analysis in this study was performed using the IBM SPSS version 23.0 for Windows.

Ethical considerations
This study received ethical approval from the Research Ethics Committee, Faculty of Medicine, Diponegoro University, Indonesia (No. 158/EC/FK-RSDK/IV/2017). Prior to the study, the respondents were informed of the purpose of the study, the intervention, the benefits, and that the participation was voluntary; hence, all of them had the right to withdraw from the study at any time during the study period. All respondents signed an informed consent to participate in this study.

RESULTS
Demographic characteristics of respondents
Table 1 shows the comparison of demographic characteristics between the intervention group and the control group. The majority of respondents from the invention group and the control group were adults, males, single, obtained senior secondary education and were employed. Chi-square test showed that there was no significant correlation in age, marital status, educational status, and employment status with the intervention group and control group, except for gender (X^2=4.1, p=.043).

Table 1. Demographic characteristics of respondents in the intervention and the control groups

Demographic characteristics	Intervention Group (n=27)		Control Group (n=27)		p
	f	%	f	%	
Age					0.830
Adolescent	12	44.4	13	48.1	
Adult	13	48.1	13	48.1	
Elderly	2	7.4	1	3.7	
Gender					0.043
Male	21	77.8	26	96.3	
Female	6	22.2	1	3.7	
Marital status					0.820
Single	20	74.1	18	66.7	
Married	5	18.5	6	22.2	
Divorced	2	7.4	3	11.1	
Educational status					0.196
No formal education	1	3.7	0	0	
Did not finish elementary school	1	3.7	5	18.5	
Elementary school	4	14.8	8	29.6	

Demographic characteristics	Intervention Group (*n=27*)		Control Group (*n=27*)		*p*
	f	%	*f*	%	
Junior high school	7	25.9	5	18.5	
Senior high school	10	37.0	8	29.6	
University	4	14.8	1	3.7	
Employment status					0.161
Unemployed	11	40.7	12	44.4	
Employed	16	59.3	15	55.6	

Clinical features of respondents in the intervention and the control group
Table 2 showed that the majority of respondents in both groups experienced schizophrenia in their adolescence (12-25 years old), the length of illness for 1-5 years, hospitalized for 5 times or less, currently being hospitalized for 8-14 days, and diagnosed with paranoid schizophrenia. Furthermore, the nursing diagnoses in the intervention group was dominated by hallucination, and in the control group was dominated by the risk of violence. Chi-square test showed no significant difference on the clinical features between the intervention group and the control group.

Table 2. Clinical features of respondents in the intervention and the control group

Clinical features	Intervention Group *n=27*		Control Group *n=27*		*p-value*
	f	%	*f*	%	
Age onset					0.692
Childhood (5-11 years old)	1	3.7	0	0	
Teenage (12-25 years old)	15	55.6	17	63.0	
Adult (26-45 years old)	9	33.3	9	33.3	
Elderly (46-65 years old)	2	7.4	1	3.7	
Length of illness					0.107
1-5 years	18	66.7	23	85.2	
6-10 years	3	11.1	1	3.7	
11-15 years	1	3.7	3	11.1	
16-20 years	4	14.8	0	0	
21-25 years	1	3.7	0	0	
Frequency of hospital stay					0.386
≤ 5 times	25	92.5	23	85.1	
≥ 6 times	2	7.5	4	14.9	
Length of hospital stay					
1-7 days	7	25.9	6	22.2	
8-14 days	15	55.6	12	44.5	
15-21 days	5	18.5	9	33.3	
Mental disorder diagnoses					0.256
Paranoid schizophrenia	14	51.9	15	52.6	
Hebephrenic schizophrenia	1	3.7	2	7.4	
Catatonic schizophrenia	5	18.5	3	11.1	
Unspecified schizophrenia	7	25.9	7	25.9	
Nursing diagnoses					0.833
Hallucination	13	48.1	6	22.2	
Risk of violence	10	37.0	20	74.1	

Clinical features	Intervention Group n=27		Control Group n=27		p-value
	f	%	f	%	
Suicidal risk	2	7.45	0	0	
Delusion	2	7.45	1	3.7	

Levels of hope and recovery before and after the intervention in both groups
Further results in Table 3 revealed that a majority of respondents had a high level of hope and recovery after the implementation of mindfulness therapy, as well as the mean score.

Table 3. The comparison between the level of hope and recovery before and after mindfulness therapy in both groups

Variable	Intervention Group				Control Group			
	Pre		Post		Pre		Post	
	f	%	f	%	f	%	f	%
Hope	*Mean* = 10.85		*Mean* = 11.67		*Mean* = 8.93		*Mean* = 9.03	
Low	10	37.0	2	7.4	17	63.0	17	63.0
High	17	63.0	25	92.6	10	37.0	10	37.0
Recovery	*Mean* = 75.74		*Mean* = 85.78		*Mean* = 73.26		*Mean* = 73.56	
Low	8	29.6	6	22.2	12	44.4	12	44.4
High	19	70.4	21	77.8	15	55.6	15	55.6

Table 4 shows that there was a significant difference in the level of hope and recovery between the intervention group and the control group with $p=0.00$. It means that there was a significant effect of mindfulness therapy on hope and recovery among people with schizophrenia.

Table 4. The comparison between hope and recovery from the two groups after the intervention

Variable	Intervention Group Mean±SD	Control Group Mean±SD	p-value
Hope	14.30±2.50	9.04±2.15	0.000
Recovery	86.78±4.00	73.56±6.04	0.000

DISCUSSION
This study aimed to investigate the effects of mindfulness on hope and recovery from illness among people with schizophrenia. Mindfulness therapies used in this study included several steps, focusing on calming techniques, enhancing self-awareness and self-compassion, and self-acceptance. The results of this study showed that there is a significant difference in the level of hope and recovery from illness after mindfulness therapy between the intervention group and the control group. This means that mindfulness therapy increases hopefulness and enhance recovery from illness among people with schizophrenia. Our findings support the previous evidence that mindfulness has positive impacts on recovery (Ganguly, 2018; Hayes, Herman, Castle, & Harvey, 2017; Lam & Chien, 2016; Soundy et al., 2015; Yılmaz & Okanlı, 2017).

Similar to the methods used in the study by Knight et al. (2014), the mindfulness intervention was provided three times on various days – approximately 30 minutes in each session. In this study, the participants were also asked to describe their 'present moment' and what they felt at the moment, along with focusing on their breathing during the therapy. Much like Knight et al.'s (2014) study, more than 90% of the participants reported increased awareness and acceptance. Furthermore, another study found that six weeks of Mindful Self-Compassion (MSC) therapy was effective in enhancing the patients' compassion and happiness after their rehabilitation. This therapy was conducted for 75 minutes each week with the addition of relaxation music and exercise led by a respective trainer (Gaiswinkler et al., 2020). This study confirmed that mindfulness-based therapy positively influences patients' treatments particularly among those people who were diagnosed with schizophrenia.

Mindfulness is a state of being attentive and aware of the present time, thoughts, and feelings non-judgmentally (Black, 2011). Acting mindfully and non-judgmentally were both correlated with lower defeatist beliefs and a lower need for approval in patients with schizophrenia. Mindfulness also associates with more adaptive emotion regulation and lower behavioral inhibition, which indicates a lower drive to move away from aversive stimuli (Tabak, Horan, & Green, 2015). Mindfulness therapy with a calming technique could increase the patients' awareness of their breathing, circulation, and lead them to focus in the present moment (Sari & Dwidiyanti, 2014). Mindfulness could positively improve psychiatric symptoms, psychosocial functioning, and cognitive changes that increase the awareness and insight of the illness (Chien, Cheng, McMaster, Yip, & Wong, 2019; Chien & Thompson, 2014). Psychiatric symptoms are related to hope and the presence of negative symptoms and hopelessness could challenge the process of recovery (Hayes et al., 2017; Soundy et al., 2015). A study by Yılmaz and Okanlı (2017) found that mindfulness-based therapy increased the patients' functional recovery as well as cognitive insight. Mindfulness is also found to promote composure and contributes to mood regulation, which leads to improvement of recovery factors, such as hope and life purpose (Ganguly, 2018; Lam & Chien, 2016). This study confirmed that mindfulness-based therapy positively influences patients' treatments particularly among those who were diagnosed with schizophrenia.

The findings from this study and the previous studies indicate that giving mindfulness therapy for a minimum of 30 minutes for at least 2 sessions is effective to gain its positive impacts. This therapy can also be integrated with other relaxation therapies, such as breathing exercises, music therapy, progressive muscle relaxation, mental imagery (Gaiswinkler et al., 2020), and so on, which are proven to reduce the negative symptoms, level of depression (Kavak, Unal, & Yilmaz, 2016), and promote good clinical outcomes. A recent study by Hodann-Caudevilla, Diaz-Silveira, Burgos-Julian, and Santed (2020) found that mindfulness-based interventions were effective therapies for people with schizophrenia as an adjuvant treatment. The combination of mindfulness therapy and psychosocial skills interventions could significantly improve the patients' insight and functional level (Yüksel & Bahadır-Yılmaz, 2020). However, the calming technique and assertiveness training used in this study could be more effective if the patients have good awareness and able to properly express their thoughts (Lin et al.,

2008). Hence, the role of the nurse practitioners and therapists is needed to help the patients in exploring themselves mindfully.

This study has some limitations. First, the baseline characteristic was different on gender between the two groups. Numerous studies showed that the incidence of schizophrenia in male was higher than female due to earlier age of onset (Falkenburg & Tracy, 2014; Li, Ma, Wang, Yang, & Wang, 2016; Sommer, Tiihonen, Van Mourik, Tanskanen, & Taipale, 2020). Gender differences also pointed out on better social functioning among females compared to males (Falkenburg & Tracy, 2014; Riecher-Rössler, Butler, & Kulkarni, 2018). Hence, this might influence the process of recovery. Second, this study was conducted among inpatients, where treatments and medications were ongoing. Extraneous variables such as socialization through visits from relatives was quite difficult to control. Third, this study measured the effect immediately after the intervention, hence long-term effects may not be inferred. Therefore, further study is needed to investigate the longitudinal effects of mindfulness as an intervention.

CONCLUSION
This study revealed a significant positive impact of mindfulness therapy in stimulating hope and recovery among people with schizophrenia. Therefore, it is encouraged for mental health professionals to apply mindfulness therapy as one of the interventions to promote hope and recovery. This study only measures hope and recovery outcomes. Therefore, future studies in exploring other outcomes of this intervention on other symptoms of schizophrenia, such as positive and negative symptoms, are needed. Furthermore, since this intervention is brief because of patients' length of stay, hence, conducting similar study among outpatients with a longer duration is needed.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

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Factors Affecting Sleep Problems in Preschoolers

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ABSTRACT

Background: Sleep problems are self-care deficits of sleep experienced by more than 44% of preschoolers. Some studies have showed that physical, psychological, family, environmental, and temperamental factors could cause sleep problems among children. However, other research showed that there is no correlation between sleep problems and environmental factors. There are pro-cons regarding the causes of sleep problems.

Purpose: The purpose of this study was to analyze factors affecting sleep problems among preschoolers.

Methods: A cross-sectional study was conducted among 297 preschoolers selected by systematic random sampling. Data were collected using the Children's Sleep Habits Questionnaires (CSHQ) and analyzed using bivariate (Chi-Square and Fisher tests) and multivariate (logistic regression) analyses.

Results: Results of the bivariate analysis showed that some variables were related to sleep problems among preschoolers, including family income ($p=0.027$), the education level of the mother ($p<0.001$), and bed-sharing ($p=0.003$). Multivariate analysis found that factors related to sleep problems were bed-sharing ($p=0.031$; OR=2.377), gadget use in two hours before sleep ($p=0.039$; OR= 2.703), and the education level of the mother ($p=0.007$; OR=2.244).

Conclusion: Factors related to sleep problems in preschoolers were bed-sharing, gadget use in two hours before sleep, the education level of the mother, and family income. This study recommends that environmental and family factors should be modified by limiting bed-sharing and reducing the use of gadgets before bedtime.

Keywords: Bed-sharing; gadget use; preschooler; sleep problem

BACKGROUND

Sleep problems are forms of self-care deficits of sleep or unhealthy children's sleep habits that are characterized by a score of more than 41 in the Children's Sleep Habits Questionnaire (CSHQ) (Owens, Spirito, & McGuinn, 2000). Sleep problems reported in CSHQ include bedtime resistance, sleep onset delay, sleep duration, sleep anxiety, night wakening, sleep-disordered breathing, daytime sleepiness, and parasomnias (Owens et

al., 2000). Sleep problems may hinder children to achieve optimal health. As children's growth hormone reaches its peak levels during deep sleep at night, sleep plays an important role in brain development, recovery, metabolic balance, and has a significant influence on health and development over a long period of time in life. Healthy sleep directly supports neurocognition by increasing synapse changes, neurotransmitter activation, and neuronal firing that facilitate the ability of memory consolidation, modulation, learning arrangements, and visual processes (Astill, Heidjen, Ijzendoorn, & Someren, 2012; Tso et al., 2016).

Some studies have showed more than 44% of preschoolers experienced sleep problems (Amintehran et al., 2013; Wahyuningrum, Rahmat, & Hartini, 2018). Research in Iran found that 64,9% of preschoolers experienced sleep problems such as excessive daytime sleepiness (Amintehran et al., 2013). In Indonesia, especially in Semarang city, a study reported a mean score of >41 in the CSHQ among preschoolers involved in the study, indicating problems of sleep (Wahyuningrum et al., 2018). Unresolved sleep problems result in physical, cognitive, psychological, and social problems. The examples of these problems include suboptimal growth, obesity, lack of school readiness, poor behavior, and lack of cognitive competence (Biggs et al., 2015; Speirs et al., 2014; Tso et al., 2016; Zahara, Hartanto, & Adyaksa, 2013).

Sleep problems in children are evident to be affected by physical, psychological, family, environmental, and temperamental factors (Kliegman, Stanton, & St Geme, 2016). Regarding the family factor, a study reported that the quality of both mother-infant and father-infant interactions was positively related to children's percentage of night-time sleep at preschool age (Bordeleau, Bernier, & Carrier, 2012). In terms of environmental factor, media exposure may lead to sleep difficulties through negative impacts on sleep scheduled and routines (Bathory & Tomopoulos, 2017). In addition, culture also affects sleep problem on preschooler as reported in a study about cultural differences between Asian predominant and Caucasian predominant (Mindell, Sadeh, Kwon, & Goh, 2013). In Indonesia, 72.6% of children have some habits that could lead to sleep problems such as bed-sharing, late bedtime, and short nighttime sleep (Mileva-Seitz, Bakermans-Kranenburg, Battaini, & Luijk, 2017; Mindell et al., 2013).

Factors affecting sleep problems vary in different studies. In Tehran, research focusing on analyzing the correlation between ages and sleep problems found some differences in the mean score of sleep duration between the pre-school age and school-age groups (Amintehran et al., 2013). Furthermore, Mindell et al. (2013) found significant cross-cultural differences in sleep pattern, sleeping arrangement, and parent-reported sleep problems in preschool-aged children. This study however did not analyze other factors like socioeconomic and environmental factors that might affect sleep. In Indonesia, while a study stated that sleep problems could affect the growth of children (Zahara et al., 2013), research investigating factors affecting sleep problems among preschoolers is rarely found. Furthermore, though some studies reported that physical, psychological, family, environmental, and temperamental factors affect sleep problems in preschoolers, other research showed no correlation between sleep problems and environmental factors such as the availability of television, computers, cell phones, and video games in the bedroom

(Amalina, Sitaresmi, & Gamayanti, 2015). Thus, it is important to conduct a study to identify factors that are related to sleep problems among preschoolers.

PURPOSE
This study aimed to analyze factors affecting sleep problems among preschoolers.

METHODS
Design and samples
This study used a cross-sectional research design and was conducted in a sub-district in Semarang City, Indonesia. Forty-eight kindergartens are registered in the district, and 16 kindergartens were selected using systematic random sampling for research purposes. The number of the sample was determined by using the "rule of the thumb" (Dharma, 2011); therefore, the minimal number of samples was 60-300. The inclusion criteria were children aged 4-6 years old, being kindergarten pupils in the research area, and expressed willingness to participate in the study as shown by their primary caregivers. The exclusion criteria were children with autism and with incomplete questionnaire. In the research process, two kindergartens were dropped out as they did not have sufficient number of students. Thus, only 14 Kindergartens were included in this study with a total of 297 respondents who met the inclusion and exclusion criteria.

Research instrument and data collection
Data of sleep problems were collected using the Children's Sleep Habits Questionnaire (CSHQ). The Indonesian version of this questionnaire was validated by Hartini, Sunartini, Herini, and Takada (2017). The internal consistency of all items of the CHSQ was 0.80. The CSHQ is suitable for screening sleep behavior problems in Indonesian children aged 4-10 years old. The CSHQ consists of 33 statements and contains 8 sleep problem domains (bedtime resistance, sleep onset delay, sleep duration, sleep anxiety, night waking, parasomnia, sleep-disordered breathing, and daytime sleepiness). Data on physical, family and environmental factors were collected using a questionnaire that was completed by primary caregivers. The questionnaire required information about the age of the child, gender, history of illness, family income, working mother status, parental status, education level of mother, bedroom, bed (bed-sharing), TV in the bedroom, electronic devices in the bedroom, and gadget use in two hours before sleep. The data were collected from June to August 2019. Primary caregivers completed the CSHQ and questionnaires about physical, family, and environmental factors.

Data analysis
The collected data were analyzed using a univariate analysis to determine the frequency distribution and bivariate analysis using the Chi-square and Fisher tests to determine factors related to sleep problems among preschoolers. A multivariate analysis using the logistic regression was then performed by including independent variables that had a p-value of <0.25. Multivariate analyses were used to analyze variables simultaneously and get the best and simplest model that described the relationship between the independent and dependent variables. Any variables having a significant bivariate test at some arbitrary levels was selected as a candidate for the multivariate analysis. If researchers used a traditional level, such us 0.05, for selected candidate variables in a multivariate test, there could be failure in identifying variables known to be important. The researchers

based this on the Wald test from logistic regression and p-value cut-off point of 0.25. The dominant factor could be known by the Odds Ratio value that was shown in the logistic regression test results.

Ethical consideration
This study obtained ethical approval from the Research Ethics Committee of Faculty of Medicine, Universitas Diponegoro (Number 293/EC/KEPK/FKUNDIP/VII/2019). The permission from the Educational Authorities in Semarang city was secured prior to the study, as well as informed consent from the parents of all respondents.

RESULTS
Characteristics of respondents
As presented in Table 1, the results showed that sleep problems were experienced by a majority of respondents in this study (87.5%). Most of them were boys (52.2%), aged ≥5 years old (50.8%), and did not have a history of illness (92.3%). Furthermore, most respondents had parents with family income of less than five million rupiahs per month (67.3%), unemployed mothers (51.2%), complete parents (92.3%), and graduated from elementary, middle, or high school (75.8%). Furthermore, a majority of children slept in the same room with their parents (89.9%), shared a bed with parents (80.1%), and had electronic devices in their room (68%).

Table 1. The characteristic of respondents (*n*=297)

Characteristics of respondents	*f*	*%*
Sleep on preschooler		
Sleep problems (CSHQ > 41)	260	87.5
Normal sleep habits (CSHQ ≤41)	37	12.5
Physical factors (age)		
< 5 years	146	49.2
≥ 5 years	151	50.8
Physical factors (gender)		
Boys	156	52.5
Girls	141	47.5
Physical factors (history of illness)		
No	274	92.3
Yes	23	7.7
Family factors (family income)		
≥ Rp. 5.000.000,00 per month	97	32.7
< Rp. 5.000.000,00 per month	200	67.3
Family factors (working status of the mother)		
Unemployed mothers	152	51.2
Working mother	145	48.8
Family factors (parental status)		
Single parents	23	7.7
Complete parents	274	92.3
Family factors (education level of mother)		
College graduate	72	24.2
Elementary/middle/high school	225	75.8

Characteristics of respondents	f	%
Environment factors (bedroom)		
Alone	30	10.1
One room with parents	267	89.9
Environment factors (bed-sharing)		
Alone	59	19.9
Share with parents	238	80.1
Environment factors (TV in bedroom)		
No	161	54.2
Yes	136	45.8
Environment factors (electronic devices in the room)		
No	95	32
Yes	202	68
Gadget use in 2 hours before sleep		
No	211	71
Yes	86	29

The correlation between physical, family, environmental factors and sleep problem in preschoolers

Table 2 shows that factors associated with sleep problems among preschoolers were family income (p=0.027), education level of the mother (p<0.001), and bed-sharing (p=0.003). These results indicated that there was a significant relationship between each of these variables with sleep problems.

Table 2. Correlation between physical, family, and environmental factors, and sleep problems among preschoolers (n=297)

Variable	Children's Sleep Habit				p-value
	CSHQ ≤41 (Normal sleep)		CSHQ >41 (Sleep problem)		
	n	%	n	%	
Age					
< 5 years**	15	10.3	131	89.7	0.262[a]
≥ 5 year	22	14.6	129	85.4	
Gender					
Boys**	16	10.3	140	89.7	0.227[a]
Girls	21	14.9	120	85.1	
History of illness					
No**	34	12.4	240	87.6	1.000[b]
Yes	3	13	20	87	
Family income					
≥ Rp. 5.000.000,00 per month**	18	18.6	79	81.4	0.027[a*]
< Rp. 5.000.000,00 per month	19	9.5	181	90.5	
Working status of the mother					
Unemployed mothers**	18	11.8	134	88.2	0.742[a]
Working mother	19	13.1	126	86.9	
Parental status					
Single parents	2	8.7	21	91.3	0.751[b]
Complete parents**	35	12.8	239	87.2	

| Variable | Children's Sleep Habit | | | | p-value |
| | CSHQ ≤41 (Normal sleep) | | CSHQ >41 (Sleep problem) | | |
	n	%	n	%	
Education level of the mother	18	25.0	54	75.0	<0.001[a]*
College graduate**					
Elementary/Middle/High School	19	8.4	206	91.6	
Bedroom					
Alone**	7	23.3	23	76.7	0.076[b]
One room with parents	30	11.2	237	88.8	
Bed-sharing					
Alone**	14	23.7	45	76.3	0.003[a]*
Share with parents	23	9.7	215	90.3	
TV in bedroom					
No**	19	11.8	142	88.2	0.709[b]
Yes	18	13.2	118	86.8	
Electronic devices in the room					
No **	15	15.8	80	84.2	0.233[a]
Yes	22	10.9	180	89.1	
Gadget use in 2 hours before sleep					
No**	31	14.7	180	85.3	0.068[a]
Yes	6	7.0	80	93.0	

Notes: [a] Chi-square test; [b] Fisher test; *p-value <0.05; **Reference for multivariate analysis

The factors influencing sleep problems on preschoolers
Table 3 shows that the strength of the relationship from the strongest to the weakest is gadget use (OR=2.703), bed-sharing (OR=2.377), and mother's education (OR=2.244). The dominant factor influencing sleep problems was gadget use (OR=2.703).

Table 3. Results of multivariate analysis (logistic regression)

	Variable	Coefficient	P	OR (CI 95%)
Step 1	Gender	0.396	0.294	1.486 (0.71-3.11)
	Family income	-0.181	0.676	0.835 (0.36-1.95)
	Bedroom	-0.517	0.361	0.596 (0.20-1.81)
	Bed-sharing	-0.682	0.136	0.506 (0.21-1.24)
	Gadget use in 2 hours before sleep	-1.085	0.030	0.338 (0.13-0.90)
	Education level of mother	-1.132	0.009	0.322 (0.14-0.76)
	Electronic devices in room	-0.424	0.270	0.654 (0.31-1.39)
	Constanta	3.452	<0.001	31.575
Step 2	Gender	0.385	0.307	1.469 (0.70-3.07)
	Bedroom	-0.499	0.377	0.607 (0.20-1.84)
	Bed-sharing	-0.710	0.117	0.491 (0.20-1.19)
	Gadget use in 2 hours before sleep	-1.089	0.030	0.337 (0.13-0.90)
	Education level of mother	-1.217	0.002	0.296 (0.14-0,63)
	Electronic devices in room	-0.436	0.256	0.647 (0.30-1.37)
	Constanta	3.429	<0.001	30.855
Step 3	Gender	0.391	0.298	1.478 (0.71-3.09)
	Bed-sharing	-0.881	0.029	0.414 (0.19-0.91)
	Gadget use in 2 hours before sleep	-1.050	0.034	0.350 (0.13-0.92)

	Variable	Coefficient	P	OR (CI 95%)
	Education level of mother	-1.190	0.002	0.304 (0.14-0.64)
	Electronic devices in room	-0.416	0.276	0.660 (0.31-1.40)
	Constanta	3.355	<0.001	28.657
Step 4	Bed-sharing	-0.904	0.024	0.405 (0.18-0.89)
	Gadget use in 2 hours before sleep	-0.988	0.043	0.372 (0.14-0.97)
	Education level of mother	-1.211	0.002	0.298 (0.14-0.63)
	Electronic devices in room	-0.439	0.248	0.645 (0.31-1.36)
	Constanta	3.519	<0.001	33.737
Step 5	Bed-sharing	-0.907	0.031	2.377 (1.08-5.22)
	Gadget use in 2 hours before sleep	-1.018	0.039	2.703 (1.05-6.96)
	Education level of mother	-1.185	0.007	2.244 (1.25-4.04)
	Constanta	3.377	<0.001	29.290

DISCUSSION

This study investigated factors affecting sleep problems in preschoolers. Bed-sharing, gadget use in two-hours before sleep, and education level of mother were factors that affected sleep problems in a majority of preschoolers in this study. In addition, family income is related to sleep problems in children at this age. The results of this study confirm previous research by Amintehran et al (2013), which reported that most preschoolers experienced sleep problems and bedtime resistance, and Wahyuningrum et al. (2018) which found that the mean of sleep habits of preschoolers in the CSHQ was more than 41, indicating most of preschoolers suffered sleep problem. However, sleep problems were found more in younger children, as they experienced a period of transition and adaptation when entering the first year of kindergarten, and thus it could become stressors for children. A child's psychological state is related to sleep problems in children (Bagley, Kelly, Buckhalt, & El-sheikh, 2016). Most sleep problems on preschoolers in this study were affected by physical, family, and environmental factors.

Bed-sharing

This study showed that factor affecting sleep problems on preschoolers is bed-sharing. Children who shared a bed with parents had a greater risk of 2.377 experiencing sleep problems than children who slept in their own beds. This study is in line with a study by Lo (2016), which conveyed that one of the main predictors of the lack of quality and quantity of sleep was bed-sharing. A study in Korea also showed that in families with low economic status, bed-sharing habits were associated with poor sleep quality (Chung et al., 2014).

In most Asian cultures, bed-sharing and room-sharing are common. It is the same case in Indonesia, where children usually sleep with their parents. Children share beds in Indonesia as they think that it brings a sense of comfort, safety, and security. This habit starts at birth and continues throughout life (Hollan, 2013; Mindell et al., 2013). However, friends of bed-sharing, both parents and relatives (co-sleepers) may do more activities before going to sleep such as talking and playing which can then cause sleepless nights and sleep disturbance for the preschoolers. Another thing might be that parents are more aware of a child's sleep disorder, as the duration of late sleep results in a child's sleep duration decreasing and parents who are experiencing problems or stress can also interfere with the child's sleep (Wang et al., 2013). Unhealthy sleep or poor sleep hygiene

from co-sleepers can also result in self-care sleep deficits in their children (Li et al., 2010). The 30-minute habits before bedtime can provide cognitive, psychological, and emotional stimulation. This can delay sleep so that disruption in sleep patterns and circadian rhythm can occur (Maanen et al., 2015).

Sleep and waking are regulated by the circadian process and by a homeostatic process. The circadian process is driven by the circadian clock located in the suprachiasmatic nucleus in the ventral hypothalamus and this clock is synchronized by daily exogenous environmental cues. Some examples of exogenous environmental cues are daily routines (such as hearing alarm clock and eating meals) and zeitgebers (the most powerful zeitgeber is light that activates photoreceptors in the retina inhibiting pineal gland secretion of the sleep-promoting hormone, melatonin) (Bathory & Tomopoulos, 2017). Friends of bed-sharing could provide preschoolers exogenous environmental cues when they are sleeping (Chung et al., 2014).

Gadget use in two hours before sleep
In this study, the gadget usage before going to sleep in the bivariate analysis was not related to sleep problems. In the multivariate analysis, however, the gadget usage has a significant relationship to sleep problems. In addition, gadget usage has a greater relationship than mother's education. This result is in accordance with a previous study reporting that there was a significant relationship between the use of touch screen gadget with nighttime sleep, daytime sleep and sleep onset (Cheung, Bedford, Saez De Urabain, Karmiloff-Smith, & Smith, 2017). Another study has also shown that the habit of using a gadget 30 minutes before bedtime was associated with sleep disorders (Amalina et al., 2015)

Several hypotheses explain why gadget use in two hours before sleep affected sleep problems. First, one of the most zeitgeber (daily exogenous environmental cues) is light, where light exposure from gadget before sleep may alter the sleep/wake cycle through changing melatonin levels (Bathory & Tomopoulos, 2017). Akacem, Wright, and LeBourgeois (2018) found that robust melatonin suppression remained attenuated for 50 minutes after termination of the light stimulus in response to the bright light stimulus. Melatonin levels did not return to 50% of preschoolers who observed in the dim light condition 50 minutes after the light exposure. Second, inappropriate content of gadgets can be an emotional stimulus for preschoolers (Garrison, Liekweg, & Christakis, 2011). Contents of gadget usage that affect the temperament of preschoolers will cause sleep problems. Nightmares can occur during rapid eye movement (REM) sleep, typically early in the morning, most commonly in preschoolers. Third, increased media use can result in reduced sleep duration through displacement of sleep time (Bathory & Tomopoulos, 2017). Children who use gadget in evening will increase arousal and behavioral sleep delay and further will cause sleep problems, including increased sleep onset latency, nightmares, frequent night waking and difficulty waking (Garrison et al., 2011).

Education level of the mother
Based on the OR score, children with mothers who graduated from elementary or junior high or high school had a greater risk of 2.244 experiencing self-care sleep deficits than children with mothers who graduated from college. In the multivariate analysis, the

mother's education also showed an effect on sleep problems of preschoolers' sleep. This study is in line with the research by (Costa, Barros, & Santos, 2013), showing that one of the self-care sleep deficits, sleep onset delay in preschoolers was related to mother's education level. Another research also shows that a mother's education was related to the quality of children's sleep (Barazzetta & Ghislandi, 2017). Girls are usually ensured that when they are adults, they will manage family better and grow children healthier. With education, a woman is also able to educate her children better (Ossai & Nwalado, 2011). The educated mothers in this study might have a better way to educate their children about sleep hygiene. Thus, their children had less sleep problems compared to the ones with lower educated mothers.

In addition, the results of this study support the research of Bøe, Hysing, Morten, Lundervold, and Sivertsen (2012) which showed that the level of mother's education was related to children's sleep problems, especially bedtime. Healthy sleep patterns can be established and sleep problems could be prevented and managed through sleep-promoting parenting or good sleep hygiene (Bathory & Tomopoulos, 2017). In neurophysiology of sleep, bedtime routines provide external clues, that sleep is coming and assists children to prepare for sleep mentally by being both predictable and calming. By about 6 months of age, parents should begin using a regular bedtime routine.

Family income
The result of this study illustrates that family income is related to sleep problems in preschoolers. This result is congruent with a study by Barazzetta and Ghislandi (2017), which concluded that family income influenced children's sleep problems, as well as by Bagley et al. (2016) which showed that socioeconomic status was associated with more subjective complaints at night, more frequent waking at night, fatigue throughout the day and increased sleep disturbance and more pre-sleep worries. Occupation is also related to psychological distress in rural areas (Saifullah et al., 2020).

Families with low incomes will require more effort than high-income families to provide a comfortable home environment for children, including the room environment where children sleep. Home sleeping conditions are associated with poor sleep quality among low-income preschool children. Research found that in their low-income sample, children's poor sleep quality was correlated with the frequency of sharing a room with parents, and with not sleeping alone in their own bed. Co-sleeping was not the only factor associated with poor sleep quality among preschool children involved in the study (Chung et al., 2014).

The results of this study indicate that family and environmental factors are factors related to the occurrence of sleep problems among preschoolers. Family income and mother's education are expected to be factors that can promote a comfortable and safe sleeping environment for children. Mother's education can support the implementation of good sleep hygiene for children by not sharing a bed with children and limiting the use of gadgets before going to sleep.

The current study has some limitations. First, research time was limited, therefore exploration of children's and parents' experiences on bed-sharing could not be done.

Second, measures of sleep problem were based on parents' reports in which they had to recall the past events. This might result in misclassification.

CONCLUSION
This study showed that bed sharing, gadget use in two hours before sleep, the education level of the mother, and family income were factors related to sleep problems among preschoolers. This study suggests that health workers should increase their knowledge of the family for modifying environmental and family factors and applying good sleep hygiene for children by limiting bed-sharing and the usage of gadgets before going to sleep. A previous study indicated that bed-sharing is a culture in Indonesia. Hence, it is suggested for further research to explore the experiences of children and parents with bed-sharing.

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CONFLICT OF INTEREST
The authors declare no conflict of interest.

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