Acute Confusional State and Management by Healthcare Personnel among Medical Elderly Patients in a Tertiary Care Hospital

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Abstract:

Acute confusional state (ACS) is a common condition in hospitalized elderly patients. However, little is known about the prevalence and incidence, and how healthcare personnel manage the ACS in hospitalized elderly patients. This prospective descriptive study aimed to explore the prevalence and incidence of ACS in elderly patients, and management by the healthcare personnel in elderly patients with ACS admitted to medical wards. Purposive sampling was used to recruit a sample of 192 elderly patients in medical wards at a tertiary hospital, and consecutive sampling was used to recruit a sample of 31 healthcare personnel working in those wards. The data collection was conducted from August to November 2018, using questionnaires and assessment forms. The data were analyzed using descriptive statistics, Chi-square, and content analysis. The point prevalence rate of ACS in elderly patients at admission was 3.65%, while its incidence was 5.21%, so the period prevalence rate was 8.85%. Risk factors associated with ACS included dementia, hypoxemia, advanced age, infection, and insomnia. For management by physicians, all elderly participants received medical treatment to minimize risk factors of ACS. The management by other healthcare personnel included participation in the treatment of underlying causes, managing ACS behaviors, prevention of complications, and restoration of functions. In addition, facilitators for management included family participation in patient care, the interdisciplinary team, care management guidelines, and educational training. Barriers to management consisted of workload and inadequate experience or knowledge of the personnel. Findings suggest that healthcare personnel should proactively assess, prevent, and manage ACS in elderly patients to resume normal as soon as possible.

Keywords: Acute confusional state, Medical elderly patients, Prevalence and Incidence, Management, Healthcare personnel

ภาวะสับสนเฉียบพลันและการจัดการโดยบุคลากรด้านสุขภาพในผู้สูงอายุที่พักรักษาในแผนกอายุรกรรม โรงพยาบาลตติยภูมิ

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บทคัดย่อ :

ภาวะสับสนเฉียบพลันเป็นภาวะที่พบได้บ่อยในผู้ป่วยสูงอายุที่รักษาตัวในโรงพยาบาล อย่างไรก็ตามข้อมูลเกี่ยวกับความชุก อุบัติการณ์ และการจัดการของบุคลากรด้านสุขภาพในผู้สูงอายุที่มีภาวะสับสนเฉียบพลันยังมีค่อนข้างน้อย การศึกษาครั้งนี้จึงเป็นการวิจัยเชิงพรรณนาแบบศึกษาไปข้างหน้าที่มีวัตถุประสงค์เพื่อสำรวจความชุกและอุบัติการณ์ของภาวะสับสนเฉียบพลันในผู้ป่วยสูงอายุที่พักรักษาในแผนกอายุรกรรม และการจัดการโดยบุคลากรด้านสุขภาพโดยการสุ่มตัวอย่างแบบเจาะจง เพื่อคัดเลือกกลุ่มตัวอย่างผู้ป่วยสูงอายุ จำนวน 192 ราย ในหอผู้ป่วยอายุรกรรม โรงพยาบาลตติยภูมิแห่งหนึ่ง และใช้การสุ่มตัวอย่างแบบต่อเนื่อง เพื่อคัดเลือกกลุ่มตัวอย่างจากบุคลากรด้านสุขภาพ จำนวน 31 ราย ที่ปฏิบัติงานในหอผู้ป่วยอายุรกรรม ระหว่างเดือนสิงหาคมถึงพฤศจิกายน 2561 โดยใช้แบบสอบถามและแบบประเมินในการเก็บรวบรวม วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา ไคสแควร์ และการวิเคราะห์เนื้อหา ผลการวิจัยพบว่าอัตราความชุกของภาวะสับสนเฉียบพลันในผู้ป่วยสูงอายุ ณ เวลาที่เข้ารับการรักษาเท่ากับร้อยละ 3.65 อุบัติการณ์ของภาวะสับสนเฉียบพลันเท่ากับร้อยละ 5.21 และอัตราความชุกของภาวะสับสนเฉียบพลันในผู้ป่วยสูงอายุช่วงระยะเวลาสามเดือนเท่ากับร้อยละ 8.85 ปัจจัยเสี่ยงที่มีความสัมพันธ์อย่างมีนัยสำคัญกับการเกิดภาวะสับสนเฉียบพลันในผู้ป่วยสูงอายุ คือ ภาวะสมองเสื่อม ภาวะพร่องออกซิเจน อายุที่มากขึ้น ภาวะติดเชื้อ และภาวะนอนไม่หลับ ในส่วนของการจัดการของแพทย์ กลุ่มตัวอย่างทุกคนได้รับการรักษาที่สาเหตุเพื่อลดปัจจัยเสี่ยงของภาวะสับสนเฉียบพลัน ในขณะที่การจัดการโดยไม่ใช้ยาโดยบุคลากรด้านสุขภาพ ได้แก่ การมีส่วนร่วมในการรักษาสาเหตุ การจัดการพฤติกรรม การป้องกันภาวะแทรกซ้อน และการฟื้นฟูสภาพการทำหน้าที่ นอกจากนี้ยังพบว่าปัจจัยสนับสนุนในการจัดการภาวะสับสนเฉียบพลันประกอบด้วย ระบบการดูแลที่ส่งเสริมให้ครอบครัวมีส่วนร่วม การมีทีมสหสาขาวิชาชีพ การมีแนวทางในการจัดการดูแล และการจัดฝึกอบรม ส่วนอุปสรรคสำหรับการจัดการภาวะสับสนเฉียบพลัน ประกอบด้วย ภาระงาน การมีประสบการณ์หรือความรู้ไม่เพียงพอ ผลการวิจัยครั้งนี้ สนับสนุนให้เห็นว่าบุคลากรด้านสุขภาพควรดำเนินการเชิงรุกในการประเมิน ป้องกัน และจัดการภาวะสับสนเฉียบพลันในผู้สูงอายุเพื่อให้กลับคืนสู่ภาวะปกติโดยเร็วที่สุด

คำสำคัญ : ภาวะสับสนเฉียบพลัน ผู้สูงอายุในแผนกอายุรกรรม ความชุกและอุบัติการณ์ การจัดการ บุคลากรด้านสุขภาพ

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Background

Acute confusional state (ACS) is a syndrome characterized by changes in the level of cognitive function, attention, and perception of the environment that develops over a short period of hours or days and fluctuates during the day.[1] ACS is commonly found in hospitalized elderly patients.[2] The prevalence rate tends to increase with advancing age, rising to 14% among those greater than 85 years of age.[3] In Thailand, the prevalence of ACS in hospitalized elderly patients was reported as 40.4%, and the incidence of ACS was between 6.3% and 8.4%.[2,4] However, the prevalence rate and incidence rate of ACS in elderly patients are unclear because there are multiple factors to induce ACS.[5,6] Therefore, it is difficult for the diagnosis depending upon patients' clinical features and healthcare personnel's alertness.

For elderly patients who develop to ACS, they have many negative consequences. These include long lengths of a hospital stay,[7] functional decline,[8] high medical expenses,[9,10] increased mortality rates,[11] and increased stress in caregivers.[1] Therefore, healthcare personnel should monitor and protect patients with associated factors and promptly manage causes or risk factors to improve patient care outcomes. The evidence-based review indicates that the effective management of ACS, both non-pharmacological and pharmacological treatment methods, can reduce the incidence of ACS, mitigate its severity, decrease the duration of the episode, and also shorten the length of a hospital stay.[12] Thus, the effective management of ACS is necessary. However, studies of ACS management are few, while the incidence rate is high.

Little is known about how healthcare personnel manage the ACS in elderly patients, and what information about the facilitators and barriers of ACS management is. Therefore, this study aimed to explore the prevalence and the incidence rates of ACS in elderly patients, management by the healthcare personnel, and facilitators and barriers to management of ACS.

Objectives

The objectives of this study were to: 1) explore the prevalence rate and incidence rate of ACS among elderly patients admitted to medical wards, 2) compare risk factors of ACS between elderly patients with and without ACS, 3) explore the management by healthcare personnel of elderly patients with ACS admitted to medical wards, and 4) explore the facilitators of and barriers to ACS management perceived by healthcare personnel in medical wards.

Study Framework and Literature Review

The framework of this study was synthesized from a literature review about the clinical manifestations, risk factors, and management of ACS among elderly people. ACS is "a syndrome characterized by a disturbance of consciousness and a change in cognition that develops over a short period" that can be caused by general medical conditions, substance use (i.e., drug abuse, medications, or toxin exposure), multiple etiologies, or other indeterminate causes.[13]

The risk factors that contribute to the ACS are multifactorial, but can be divided into two main factors. Firstly, predisposing factors mean those related to characteristics of the patients that have venerable conditions, such as demographic characteristics, cognitive status, functional status, sensory impairment, decreased oral intake, drugs, and coexisting medical conditions. Secondly, precipitating factors mean the external factors related to patients, such as drugs, primary neurologic diseases, comorbidities, surgery, the environment, prolonged sleep deprivation, electrolyte imbalance (e.g., high or low sodium), and metabolic disorders (e.g., urea/creatinine ratio abnormality, high and low glucose levels, etc.).[3] The factors aforementioned can be found at all times of admission to the hospital. Therefore, elderly patients with ACS need close monitoring and effective management to decrease the consequence of ACS.

Management of ACS is divided into two main methods, including non-pharmacological and pharmacological treatments. The management of ACS aims to maintain behavioral control, prevent complications, and support functional needs. The non-pharmacological treatment is the first-line treatment for patients with ACS.[14] This approach can be divided into four groups, including 1) removal or treatment of underlying causes, 2) management of ACS behaviors, 3) prevention of complications, and 4) restoration of cognitive and physical functions.[3,15] The pharmacological treatment of elderly patients with ACS can be divided into four groups, including 1) antipsychotics (e.g., haloperidol), 2) atypical antipsychotics (e.g., risperidone, olanzapine, and

quetiapine), 3) benzodiazepine (e.g., lorazepam), and 4) antidepressants (e.g., trazodone).[14,16] However, for elderly patients with ACS, the pharmacological treatment is not the first-line because it has both positive and negative consequences for patients, such as extrapyramidal symptoms, although its effect controls behavior quickly. Thus, healthcare personnel should initiate this type of treatment beginning at the lowest starting dose for the shortest time possible. Haloperidol and atypical antipsychotics are recommended if the drug treatment is necessary.[3]

The facilitators are referred to factors about persons, instruments, equipment, and systems that play a role in supporting, promoting, or facilitating the healthcare personnel in developing quality care for elderly patients with ACS. For instances, the facilitators include encouraging the family caregivers and paid caregivers to enhance patient safety, having a multidisciplinary team of nurses and additional staff to care for older patients with ACS, providing the standard guidelines or policy for managing ACS, and educating or training the healthcare personnel.[17] On the other hand, the barriers are referred to such factors as persons, instruments, equipment, or systems that play a role in the cause of the problem or difficulty in the management of the elderly people with ACS, such as time and workload pressures, lack of education, and awareness.[17]

According to a literature review, the effective management of ACS, both non-pharmacological treatment and pharmacological treatment, can reduce the consequence of ACS. However, current studies on the management of ACS among elderly patients by the healthcare personnel are scant. Therefore, the

researchers will explore the prevalence rate and incidence rate of ACS among elderly patients and their management by healthcare personnel, including facilitators and barriers, as aforementioned. In this study, the prevalence rate of ACS is referred to the point prevalence rate and the period prevalence rate. The point prevalence rate refers to ACS cases presented during the first assessment of hospital admission,[2] and the period prevalence rate is referred to cases with ACS presented over an interval of time.[18] The incidence rate of ACS means a new case with ACS arising during hospitalization divided by the number of elderly patients that had been admitted during the total time of the study.[2]

Materials and Methods

This study used a prospective descriptive research design, conducted in four medical wards at a tertiary care hospital. The sample size was determined by the period at three months between August to November 2018, which was a study of the prevalence and incidence at a certain time. All elderly patients who met the criteria of the study in this period were recruited, therefore, 192 elderly patients were recruited into this study.

The samples in this study had two groups: elderly patients and healthcare personnel. Elderly patients who were admitted to four medical wards and met the inclusion criteria were: 1) aged 60 years or older, 2) newly admitted to medical wards, and 3) willing to participate in the study. The exclusion criteria were: 1) unconscious and unable to communicate, and 2) using a ventilator. The

healthcare personnel (registered nurses, practical nurses, and nurses' aides) at four medical wards were selected by consecutive sampling and met the inclusion criteria, including 1) being assigned to care for elderly patients with ACS in each shift, and 2) being willing to participate in the study.

Ethical Considerations

This study was approved by the Institutional Review Board (IRB), Faculty of Medicine Ramathibodi Hospital, Mahidol University (No. MURA2018/288), and the Faculty of Medicine, Chulalongkorn University (No. 353/61). All participants were informed about the objectives and methods of the study, as well as their rights to participate in or withdraw from the study without any impact.

Research Instruments

The research instruments used in this study were divided into three parts:

Part 1: The Demographic Data Forms included the semi-structured questionnaires to elicit the patient's demographic data by interviewing family or caregivers, and healthcare personnel's demographic data by self-administration.

Part 2: The Thai version of the Confusion Assessment Method was originally developed by Inouye et al.[19] and then was translated from English to Thai by Wongpakaran et al.[20] This assessment form has four criteria consisting of 1) acute onset and fluctuating course, 2) inattention, 3) disorganized

thinking, and 4) altered level of consciousness. The diagnosis of ACS requires the presence of features of 1 and 2, plus either 3 or 4. For its psychometric properties, the sensitivity of 91.9%, a specificity of 100%, and the interrater agreement (Cohen's Kappa =.91) were reported.[20]

Part 3: The semi-structured questionnaires, including 1) the Management of the Acute Confusional State, and 2) the Facilitators and Barriers of the Management of the Acute Confusional State developed by researchers from the literature review.[3,16-17,21-22] The questionnaire on the management of ACS was divided into two parts, including non-pharmacological and pharmacological management. Its content validity index (CVI) among a panel of three experts was equal to .96. For the questionnaire on facilitators and barriers of management, it consisted of opened-end questions to assess the opinions of the healthcare personnel, including nurses, practical nurses, and nurse's aides. The content of this instrument was examined by a panel of three experts, and its CVI was equal to 1.

Statistical analysis

The data were analyzed using descriptive statistics, including frequency, percentage, mean, median, standard deviation (SD) for the demographic data, and management by the healthcare personnel. Also, the chi-square test was used to compare risk factors of ACS between elderly patients with and without ACS, and the content analysis for the facilitators of and barriers to ACS management perceived by the healthcare personnel.

Data Collection

After the approval of the data collection was obtained from the Institutional Review Board and the research setting's authorities, the data collection was conducted in four general medical wards. The procedures of the data collection are as follows:

1) The objectives of the study were explained to the healthcare personnel in the four general medical wards, and the number of elderly patients admitted to these wards was explored by the researcher from the admission records every day on the morning shift. The researcher (CJ) explained the objectives of the study to the elderly patients, who met the inclusion criteria, or their relatives and started collecting the demographic data of the elderly patients from medical records and interviewing the patients and their caregivers. Then, the ACS in the elderly patients was assessed by the researcher using the Thai version of the Confusion Assessment Method (CAM) during the past 24 hours by observation and inquiries from caregivers or nurses assigned to care for the elderly patients. When the patients with ACS were found at admission, the researcher recorded the occurrence rate of ACS, management by the healthcare personnel for the first time, and facilitators and barriers of the management.

2) In elderly patients without ACS at admission, the researcher (CJ) monitored and assessed the ACS in the elderly patients every day on the morning shift throughout the treatment period until: 1) completion of the 3 months duration, 2) the patient was discharged from the hospital, 3) the patient was transferred to another department, or 4) the patient died. The researcher would then stop collecting data.

3) In elderly patients having the ACS during the hospital stay, the researcher (CJ) recorded the occurrence rate of ACS, management by the healthcare personnel for the first time, and facilitators and barriers of the management. For those having more than one episode of the ACS during the hospital stay, the researcher followed the occurrence rate until discharge.

Results

This study consisted of 192 elderly patients, and most of them were female (50.52%). Their ages ranged from 60 to 100 years (M = 74.10, SD = 8.97). According to the health data, the majority of participants (94.79%) had underlying diseases. The three most common diseases/conditions were cardiovascular diseases, metabolism disorders, and cancer (86.98%, 70.83%, and 23.96%, respectively); only 5.21% of them reported no underlying disease.

The point prevalence rate of ACS at hospital admission was 3.65%, and the total period prevalence rate over the three months was 8.85%, so the incidence rate of ACS during the three months of hospitalization was 5.21% (Table 1).

Table 1. Point Prevalence Rate, Incidence Rate, and Period Prevalence Rate of ACS of Medical Elderly Patients (N = 192)

Variable	Number	Percent
Point prevalence rate		
No ACS	185	96.35
ACS	7	3.65
Incidence rate		
No ACS	182	94.79
ACS	10	5.21
Period prevalence rate		
No ACS	175	91.14
ACS	17	8.85

Among the 17 elderly patients with ACS, most of them were female (52.94 %). Their ages ranged from 74 to 96 years (M = 81.82, SD = 6.40). The common precipitating factors of ACS diagnosed by physicians included infection, insomnia, serum blood urea nitrogen abnormality, hyperglycemia, hypoxemia, dementia, electrolyte imbalance, and pain. Approximately, one-third of participants with ACS (35.29 %) had three precipitating factors per patient. The length of a hospital stay in medical wards ranged from 1 to 23 days (M = 8.35, SD = 5.99, Mdn = 7). Risk factors that were significantly associated with ACS in this study included advancing age, dementia, infection, hypoxemia, and insomnia (Table 2).

Table 2. Risk Factors of Acute Confusional State of Medical Elderly Patients (N = 192)

Risk factors	Patients without ACS (n = 175)		Patients with ACS (n = 17)		Statistics	p-value
	n	%	n	%		
Age (years)						
60–79	128	73.14	7	41.18	$\chi^2 = 7.59$	.006
≥80	47	26.86	10	58.82		
Dementia						
Yes	2	1.14	4	23.53	Fisher exact	.001
No	173	98.86	13	76.47		
Infection (n = 173)						
Yes	67	38.73	13	76.47	$\chi^2 = 9.04$	.003
No	106	61.27	4	23.53		
Hypoxemia						
Yes	5	2.86	5	29.41	$\chi^2 = 22.13$	<.001
No	170	97.14	12	70.59		
Insomnia						
Yes	36	20.57	9	52.94	$\chi^2 = 9.05$	.003
No	139	79.43	8	47.06		

Among the 31-healthcare personnel sample, there were 14 registered nurses, 14 practical nurses, and 3 nurses' aides. Almost all of them were female (90.32%), and their average age was 34.19 years (SD = 12.52, range = 21–59). Their duration of work experience ranged from 2 months to 36 years (M = 12.42, SD = 12.61, Mdn = 5). Almost half of them (48.39%) had worked for longer than five years. Most of them had never been trained about ACS care (80.65%) but had experience in caring for elderly patients with ACS (90.32%).

The management of healthcare personnel was divided into two parts: pharmacological management and non-pharmacological management. The pharmacological management was performed by physicians in all elderly patients with ACS to minimize risk factors of ACS. The common medications used for treatment included quetiapine (35.29%), haloperidol (23.53%), and lorazepam (17.65%), respectively. The non-pharmacological management by registered nurses, practical nurses, and nurses' aides included four aspects: 1) removal or treatment

of underlying causes, 2) management of ACS behaviours, 3) prevention of complications, and 4) restoration of cognitive and physical functions (Table 3).

Table 3. Non-pharmacological Management by Healthcare Personnel (N = 31)

Management	Registered Nurses (n = 14)		Practical Nurses (n = 14)		Nurses' Aides (n = 3)	
	n	**(%)***	**n**	**(%)***	**n**	**(%)***
Participation in Treatment of Underlying Causes						
Assessed causes of ACS						
−Check fluid intake/output	14	100.00	13	92.86	1	33.33
−Check laboratory results	14	100.00	2	14.29	1	33.33
−Assess comorbidity and cognitive	2	14.29	NA		NA	
Assessed and managed pain	10	71.43	2	14.29	0	0.00
Reviewed medications used**	12	85.71	NA		NA	
Assessed and removed unnecessary equipment	12	85.71	0	0.00	0	0.00
Management of ACS Behaviours						
Decreased noise at night and promoted sleep	14	100.00	13	92.86	1	33.33
Promoted family participation in caring	8	57.14	7	50	3	100.00
Used physical restraints	11	78.57	13	92.86	2	66.67
Assessed patients after physical restraint	13	92.86	13	92.86	1	33.33
Prevention of Complications						
Provided supplementary food	13	92.86	14	100	2	66.67
Promoted early mobilization	13	92.86	12	85.71	1	33.33
Prevented accidents	14	100.00	14	100	3	100.00
Monitored and notified a doctor when patients were clinically unstable	13	92.86	1	7.14	0	0.00
Restoration of cognitive and physical function						
Interacted with patients	14	100.00	14	100.00	3	100.00
Re-orientated to time, place, and persons	14	100.00	12	85.71	2	66.67
Placed a clock and calendar nearby	6	42.86	1	7.14	0	0.00
Provided well-lit environment	14	100.00	14	100.00	14	100.00
Provided hearing and visual aids	10	71.43	9	64.29	0	0.00

Note: * The percentage was calculated based on the total number of each occupation.

**Ask only the registered nurse.

NA = Not applicable

The facilitators supporting registered nurses, practical nurses, and nurses' aides in management of ACS consisted of guidelines for management, training, an interdisciplinary team, and a care system that encourages families to participate in the care of patients. On the other hand, barriers that limited their work consisted of heavy workloads, inexperience, and inadequate knowledge.

Discussion

In this study, the prevalence and incidence rates were relatively low as compared to previous studies.[2,3,4,23] The possible reasons for those results might be because of the different characteristics of the samples. Firstly, most elderly patients in this study were in the young-old group, while those in previous studies were in the middle and old-old group.[10,20] Praditsuwan et al.[3] found that the prevalence rate of ACS tends to increase with advancing age because older people are more likely to have fewer brain cells and lower levels of acetylcholine that could be a possible predisposing factor to induce ACS in elderly patients.[24] Secondly, most elderly participants in this study had no visual or hearing impairment. Inouye et.al.[25] found that interventions including elements specifically designed to address visual impairment and hearing impairment significantly reduced the number and duration of ACS episodes in hospitalized elderly patients. Therefore, the incidence of ACS might vary with sensory impairment. Thirdly, the majority of the elderly sample (88.02%) had not received medications inducing ACS, such as benzodiazepine, while a sample from a previous study received a psychotropic drug

(56.52%).[23] Alagiakrishnan and Wiens[26] found that high-risk medications, such as narcotics, major tranquilizers, neuroleptics, and benzodiazepines, have been associated with the development of ACS in elderly patients. Overall, these reasons might explain a low risk of ACS in this study.

When risk factors of ACS were compared between participants with and without ACS, it was found that advancing age, dementia, infection, hypoxemia, and insomnia were associated with ACS. These findings were consistent with previous studies.[2,3] For the advancing age, a previous study explained that older people have structural, functional, and neurochemical changes in the brain. This change makes the brain function difficult and may increase the risk of ACS.[3,24] For dementia, this phenomenon can be explained by an association with decreased cerebral blood flow, cholinergic deficiency, and inflammation. Neurodegeneration of the brain causes neuronal dysfunction and can cause synaptic failure. If patients have neuronal dysfunction and synaptic failure, this can lead to a chance of ACS.[14,27]

In addition, regarding infections, a previous study explained that systemic inflammation can induce a spectrum of changes in the central nervous system. It might be that the systemic inflammation related to infection may play a role in inducing ACS.[28,29] For hypoxemia, this study found 10 elderly patients having hypoxemia and half of them had ACS. It could be possible that medical elderly patients basically have underlying diseases, such as heart failure, myocardial infarction, arrhythmia, and lung cancer that might decrease oxygen supply.[30] As a result, the decrease in the oxygen supply to the brain causes low oxidative

metabolism, which may lead to cerebral dysfunction and ACS.[31] Lastly, relating to insomnia, more than half of the sample with ACS had insomnia. The correlation between insomnia and ACS is not clear. However, a neurotransmitter imbalance is one of the leading hypotheses, with dopamine and acetylcholine thought to be the most important neurotransmitters involved. An imbalance of these neurotransmitters also occurs in association with sleep deprivation. During ACS, the level of acetylcholine is thought to be low, and that of dopamine is high.[32,33]

Concerning the pharmacological management by physicians, the results showed that the entire participants received treatment for predisposing and precipitating factors of ACS. It is congruent with the first recommendation in several guidelines. Removing the cause of ACS in early treatment can reduce consequences.[34] The most common medications used were quetiapine, haloperidol, and lorazepam. This finding is slightly different from the guidelines of the American Psychiatric Association, which recommends a low dose of haloperidol as the first-line agent for treatment of ACS.[34] However, previous studies reported that haloperidol may cause adverse extrapyramidal symptoms, and may be replaced by atypical antipsychotics (e.g., risperidone, olanzapine or quetiapine), which are as effective as haloperidol in controlling ACS, but have a lower incidence rate of extrapyramidal adverse effects.[35]

Regarding the non-pharmacological management performed by registered nurses, practical nurses, and nurses' aides, the results revealed that all registered nurses took responsibility to operate physicians' prescriptions and therapy for patients as soon as possible. Also, practical nurses and nurses' aides monitored fluid intake/output and vital signs, according to their work scope. Thus, the management of ACS in elderly patients needs collaboration among healthcare personnel as teamwork. For the management of ACS behaviors, most healthcare personnel in this study used physical restraints rather than asked for the family to participate in caring for elderly patients. Similarly, Carr[36] found that more physical restraints were correlated with the decrease of sitter usage (nonprofessional staff or family members).

Regarding the prevention of complications, it is worth noting that among those with ACS, all registered nurses, practical nurses, and nurses' aides tried best to prevent accidents. Basically, patient safety is the essence of care that the hospital regards it as an essential policy, particularly in this vulnerable population. Lakatos et al.[37] found that falls in the general hospital were associated with the ACS. Therefore, accident prevention by these personnel is prioritized.

Lastly, the restoration of cognitive and physical functions in elderly patients was performed by registered nurses. A previous study found that restoration of cognitive functions can improve the executive function—a cognitive process that controls behavior—and reduce the length of stay in elderly patients with ACS.[38] In this study, most registered nurses performed reorientation to elderly patients. They described that this approach can reduce the risk of ACS and induce good recovery in elderly patients with ACS.

The facilitators in the management of ACS perceived by the healthcare personnel included

guidelines for the management, education and training, the interdisciplinary team, a care system encouraging family participation in care, and budgets. This result is consistent with a qualitative study[22] that reported the facilitators of non-pharmacology management of ACS. These included the involvement of family caregivers and paid caregivers to promote patient safety, having an interdisciplinary team of nursing and additional staff for collaborating on care in elderly patients with ACS, having standard guidelines or the policy for managing ACS, and educational training of the healthcare personnel. These components can help healthcare personnel manage the patients' problems timely.

On the other hand, this study found that barriers that limited the work of healthcare personnel in the management of ACS consisted of heavy workloads, lack of experience, inadequate knowledge, and patients' illness conditions. This result is consistent with a previous study, which found that high workloads, inadequate education, and unawareness of the problem affect the quality of care.[21] A high workload places the healthcare personnel burden because they cannot balance between their time and the care of patients with ACS. Also, inadequate education makes the healthcare personnel lose confidence in the care, and lack of knowledge to apply to practice.

In conclusion, risk factors of ACS in elderly patients are multiple, including the predisposing and precipitating factors. This study found that factors associated with ACS in elderly patients include advancing age, dementia, hypoxemia, infection, and insomnia. Therefore, these risk factors should be considered to prevent ACS in elderly patients. Non-pharmacological management aims to manage ACS behaviors, prevent complications, and restore functions. Facilitators for the ACS management included family participation in patient care, the interdisciplinary team, care management guidelines, and the training program for healthcare personnel. Barriers to ACS management included high workload, and inadequate experience or knowledge of the personnel. Thus, the study results can be utilized for developing interventions to prevent or manage ACS in elderly patients.

Recommendations for Nursing Practice

The recommendations for nursing practice are as follows:

1. Elderly patients admitted to the medical wards should be assessed for the baseline cognitive ability, and predisposing and precipitating factors of ACS at admission, and then be monitored continuously throughout the hospitalization. The findings in this study showed that in addition to the prevalence rate at admission, the incidence rate could occur at any time. Thus, the early and continuous detection of ACS by the healthcare personnel is critical so that they can identify its causes and reduce risk factors in time to prevent further adverse outcomes.

2. The clinical practice guidelines for ACS care management should be developed for healthcare personnel to minimize errors and manage preventable risk factors of ACS in elderly patients appropriately. However, the development of practice guidelines for ACS needs support from the organization to formulate

care policies. Thus, the findings in this study can be used as basic information for hospital administrators to establish the plan in developing practice guidelines for the prevention and management of ACS.

3. The organization can use the findings in this study to develop educational and training programs on ACS management, which would enable the healthcare personnel to gain knowledge and confidence in managing ACS appropriately.

Recommendations for Future Study

The future study should design the ACS care program that emphasizes the prevention and management of ACS by considering the facilitators of and barriers to the management of ACS as basic information so that the programs can be made suitable to the context. Then, the effectiveness of the program can be tested on health outcomes, such as health status, functional ability, and organizational outcomes, such as length of stay, falls, complication rates, and cost.

Limitations of the Study

This study was conducted with elderly patients for three months, which is relatively short, so the prevalence rate and incidence rate found in this study were limited in representing the ACS when compared with the longer-term study.

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