Symptom Experiences and Symptom Cluster across Dimensions in Thais with Advanced Lung Cancer

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Abstract: This study explores symptom experiences and symptom clusters in persons with advanced lung cancer receiving chemotherapy. Using convenience sampling, 300 Thai participants with advanced lung cancer undergoing chemotherapy were recruited from one university hospital and cancer hospital in Bangkok. Data were collected using two questionnaires: a demographic questionnaire, and the Memorial Symptom Assessment Scale. Descriptive statistics was used to determine symptom experience, and a Principal Component Factor with a Varimax rotation was used to analyze clustering of symptoms.

The results showed that the participants experienced multiple symptoms simultaneously. Lack of appetite was rated as the most prevalent and severe symptom. A problem with urination was rated as the most frequent symptom and constipation was rated as the most distressing symptom. Five symptom clusters existed in both dimensions of symptom severity and distress. However, the symptoms that loaded in each cluster and the name of the clusters were slightly different. The clusters in severity were 'Emotional-elimination discomfort', 'Anorexia-related', 'Treatment-related gastrointestinal and other', 'Neurological and body image', and 'Respiratory and sleep disturbance'. Clusters in symptom distress were 'Emotional-elimination discomfort', 'Body image', 'Anorexia-related', 'Treatment-related gastrointestinal and other', 'Treatment-related neurological and other'. Future research needs a longitudinal design to identify symptom patterns that might change over time along the disease and treatment trajectory. Our findings could be used to develop an intervention program for managing cluster of symptoms, provided they have an underlying common cause.

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Introduction

Lung cancer is a common malignant disease globally. In Thailand, it has been ranked as the first most common cancer in men (16.22%) and the fourth most common in women (6.5%).[1] Most people with lung cancer are diagnosed when their cancer is already in an advanced stage which accounts for the low survival rate. Persons with advanced lung cancer (PWALC) often experience several symptoms simultaneously.[2, 3] The presence of several symptoms occurring together, known as a symptom cluster, is concerning because concurrent symptoms may influence each other.[4]

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Symptom cluster exploration is an increasingly active field of research. However, several issues still require clarification. There is no consensus on clustering of symptoms either conceptually or methodologically. Furthermore, issues in measuring symptom clusters are still unclear if symptom clusters exist differently across symptom dimensions.

Previous studies of symptom cluster focused on only one symptom dimension.[2,3,5] However, several authors have found that symptoms are multidimensional.[6,7,8] We hypothesized that the number of symptom clusters and the symptoms within each cluster might be different, depending on which dimensions of a set of symptoms were analyzed. There is no research report in Thailand that explores variations in symptom cluster across symptom dimensions in PWALC receiving chemotherapy. Investigating symptom clusters across symptom dimensions could lead to a better understanding of the relationships among the dimensions of each symptom, and to the development of new approaches to symptom management.

Conceptual framework and related literature

The Theory of Unpleasant Symptoms (TOUS)[9] was used as the framework for this study. This model is composed of three interrelated concepts: 1) the symptoms that an individual is experiencing, with each symptom having 4 dimensions: timing (duration and frequency of occurrence), intensity or severity, distress, and quality, 2) factors influencing symptoms include physiological, psychological, and situational antecedents, and 3) performance, which is the consequence of the symptom experience, including functional and cognitive activities.[5] The major concept of symptom experience was used. Each symptom can vary in duration or timing, intensity or severity, distress, and quality. Moreover, multiple symptoms can occur together as a single event, or one symptom can precede another. This theory was selected as the framework for this study because it provides a way to conceptualize interactions among factors related to the experience of multiple symptoms occurring at the same time, as in the case of a symptom cluster.

PWALC during chemotherapy often experience several symptoms simultaneously, and thus experience more symptom distress than those with other types of cancer.[2, 10] For example, breathlessness was found strongly correlated with fatigue, and anxiety.[3] Fatigue was also reported to be associated with depression.[11] The presence of numerous symptoms occurring together as cluster is concerning because concurrent symptoms may influence each other and thus increase the overall level of symptom burden. Symptom clusters are variously defined as two or more symptoms[12] or three or more symptoms[13] that are related to each other and that occur together. Relationships among symptoms within a cluster should be stronger than relationships among symptoms across different clusters.[13]

There have been some studies of symptom clusters in various cancers.[7,8,13,14] Two studies[7, 8] investigated symptom clusters in Thai women with breast cancer and one study[14] identified symptom clusters in Thais with advanced cancer including cancers of the gastro-intestinal tract, the breast, the hepato-biliary system, and lungs. The result of symptom clusters studies in other cancer types or in studies that used heterogeneous samples cannot be generalized to PWALC, since different types of cancer have different symptom profiles. Moreover, research on symptom clusters in PWALC is scarce. In Thailand, there is only one study of PWALC, where the authors explored just the distress dimension of reported symptoms.[15] Symptoms are multidimensional, and participants may perceive their symptoms differently across symptom dimensions. Symptom dimension were prevalence, frequency, severity and distress symptom.

Our study, therefore, compared symptom clusters in the severity and distress dimensions of symptoms reported by PWALC. The other dimensions of symptoms

(prevalence, frequency, and quality) were not included in this study. Prevalence was not included because it was measured at the nominal level and therefore did not meet the measurement requirements for factor analysis. Frequency was not included because it is best studied using designs that permit identification of patterns in frequency over time. The quality dimension was not included because it is best studied using qualitative approaches, in which patients are able to describe their symptom experience. The objectives of this study were to identify the symptoms experienced by PWALC receiving chemotherapy, and to identify and compare the symptom clusters in the severity and distress dimensions.

Methods

Sample and Setting:

Sample size estimation was initially based on the requirements for exploratory factor analysis using the approach outlined by Hair et al (2010), who suggested that at least five participants per variable were acceptable.[16] Because our symptom assessment tool collected data for 32 symptoms, the minimum number of participants needed using this approach was 160. However, other author has recommended 10 participants.[17] Using this approach, 320 cases would have been required. By the end of our pre-identified data collection period, we had recruited 300 participants. In our view, this sample size was adequate because it permitted the identification of symptom cluster and showed a high Kaiser-Meyer Olkin statistic (KMO for symptom severity scores was .731, KMO for symptom distress scores was .753), measure of sampling adequacy.[18]

We recruited the 300 participants from a specific outpatient unit of a university hospital and a cancer institute during 2013-2014. The inclusion criteria were: ≥18 years, diagnosed with lung cancer and receiving at least one cycle of chemotherapy, and willing to participate in the study.

Instruments:

There were two instruments:

Demographic and Medical Record Form (DMRF) comprises two parts. The first part requests general information of age, gender, education, marital status, religion, income and financial status, living arrangement, method of payment for medical expenses, and sources of support. The second part seeks information related to medical history, including the type of treatment received, the length of time since diagnosis with lung cancer, medications, and other illnesses not related to lung cancer.

The Memorial Symptom Assessment Scale (MSAS), developed by Portenoy et al (1994)[19] is a multidimensional tool that measures the symptom prevalence, severity, and distress associated with 32 symptoms, and the frequency of 24 symptoms. Responses are given as 1 = Yes or 0 = No, about whether the participant has experienced each symptom during the past week.

Symptom frequency is scored on a 4-point Likert scale ranging from 1 (rarely) to 4 (almost constantly). Symptom severity is scored on a 4-point Likert scale ranging from 1(mild) to 4 (very severe). Symptom distress is scored on a 5-point Likert scale ranging from 0 (not at all) to 4 (very much). A total score for each symptom is calculated by summing across all of the participant's responses. Higher scores indicate more frequency, severity and distress of symptoms. Calculation of the mean score for the severity and distress dimension of each symptom were used to formulate symptom clusters.

The Thai version of the MSAS used in this study was translated[7] and used in a study of exploring symptom cluster and functional status of women with breast cancer.[7] Reliability analysis has been reported[7] with an internal consistency of 0.96. The Pearson Correlation ranging from 0.82 to 0.88 respectively for the symptom severity and symptom distress subscales.[7] In the current study, reliability of the MSAS by

Cronbach's alpha coefficient in pilot testing and the full study were 0.95and 0.93 respectively.

Design: A cross-sectional descriptive design was used in this study.

Ethical Considerations:

Ethics approval for this study was obtained from the Institutional Review Board (IRB), Faculty of Medicine, Siriraj Hospital, Mahidol University (Protocol # ID427/2556(EC4)), and The National Cancer Institute of Thailand (Protocol # ID 29_2013T_OUT317. All participants were informed regarding: the study's purpose; assurance of privacy, confidentiality, and anonymity; their right to withdraw from the study without penalty or effect on their treatment and health care services; and the usefulness of the study outcomes. Those who agreed to participate signed a consent form.

Data Collection:

Participants were identified from medical records and those meeting the inclusion criteria were approached. The PI collected all data after gaining informed consent and participants completed the two instruments. Assistance was given when required in cases of illiteracy, or other reasons.

Data Analysis:

Descriptive statistics were used to describe all symptom scores. Principal Component Factor analysis with Varimax rotation (SPSS version 17.0) and an Eigen value of 1.2 was used to identify symptom clusters. The number of factors analyzed was reduced the 26 symptoms reported by at least 30% of participants. Nine symptoms: difficulty concentrating, feeling nervous, diarrhea, feeling sad, sweats, problems with sexual activity, difficulty swallowing, mouth sores, and swelling of arms or legs were excluded from the factor analysis.

The method used to analyze symptom clusters was factor analysis. The statistical assumptions of factor analysis in this study were normal distribution, interval or near-interval data and no multicollinearity. Symptom severity and symptom distress scores revealed normal distribution and also interval level, which is qualified for using factor analysis. The Bartlett's test rejected the null hypothesis both in severity dimension ($\chi 2 = 1036.352$, df = 253, P<0.000) and distress dimension ($\chi 2 = 1145.489$, df =253, P<0.000). This means that the correlations among symptom variables existed and thus the formation of factors was possible. The problem of multicolinearity did not exist in this study. These results met the criteria and supported use of factor analysis for this data.

Results

Demographic characteristics: Participant ages ranged from 29-86 years with a mean age of 61.39 (SD = 10.26) years. The majority were male (n=167; 55.7%) and married (n=224; 74.7%). About one-fifth were government employee (n=62; 20.7%) and the same number were retired (n=62; 20.7%).

With respect to family income, the majority of participants (n= 103; 34.3%) reported household income less than 5,000 Baht (≈US$152) per month. The health care costs were mostly covered by government welfare (n=173; 57.7%). Most were living with their family (n=287; 95.7%), and had family caregiver (n=291; 97%), and spouses were the commonest caregivers of support (n=135; 45%).

Clinical Characteristics and Symptoms

Most participants were diagnosed with non-small cell lung cancer (NSCLC) (n=292; 97.3%), stage IV (n=246; 82.0%), and undergoing chemotherapy with various treatment regimens of carboplatin and gemcitabine (n=179; 59.7%). Co-morbid conditions were present in (n=282; 94%) of the participants. Hypertension was the most common co-morbidity reported (n=141; 47%). Additional details are shown in Table 1. The participants reported between 3-26 symptoms. The most prevalent symptom was lack of appetite (n= 245; 81.7%), whereas problems with urinary was reported as the most frequent symptom (n=183; mean=2.84). Lack of appetite was rated as

the most severe symptom (n=245; mean=2.56), while constipation was the most distressing (n=211; mean=2.70). Symptom experiences in ranked order are shown in Table 2.

Table 1 Demographic and clinical characteristics of the participants (n=300)

Characteristics	N	%	Characteristics	N	%
Sex			**Financial status**		
Male	167	133	Sufficient and saving	203	67.7
Female	55.7	44.3	Sufficient and no saving	63	21.0
Age (years)			Insufficient and no debt	20	6.7
Range	29-86		Insufficient and debt	14	4.7
Mean	61.39		**Methods of payment**		
SD	10.26		Government welfare	173	57.7
Marital status			Universal health care	88	29.3
Single	42	14	coverage (Gold Card)		
Married/partnered	224	74.7	Social coverage	17	5.7
Widowed/separated/divorced	34	11.3	Others (Private health insurance)	6	2.0
Level of education			**Living arrangements**		
Primary School	136	45.3	Living alone	6	2.0
Secondary School	17	5.7	With family	287	95.7
High School	21	7.0	With relative	4	1.3
Diploma/certificate	12	4.0	With friend	3	1.0
Bachelor degree	102	34.0	**Having caregiver**		
Postgraduate	12	4.0	No	9	3.0
Occupation			Yes	291	97.0
Government service	62	20.7	**Person who most provide**		
Business person	55	18.3	**support as caregivers**		
Company/labor	34	11.3	Spouse	135	45.0
Housewife	20	6.7	Mother or father	16	5.3
Farmer	22	7.3	Daughter/son	96	32.0
Not working/unemployed	45	15.0	Others: relative, friend	53	17.7
Others (Retired)	62	20.7	**Number of cycles received**		
Income (baht/month)			1	164	54.7
Range	700-200,000		2	79	29.3
Mean	28054.66		3	40	13.3
SD	31755.77		4	12	4.0
Less than 5,000	103	34.3	5	5	1.7
5,001-10,000	53	17.7	**Stage of Lung cancer**		
10,001-20,000	58	19.3	III	54	18.0
20,001-30,000	23	7.7	IV	246	82.0

Table 1 Demographic and clinical characteristics of the participants (n=300) (Continued)

Characteristics	N	%	Characteristics	N	%
30,001-40,000	12	4.0	**Co-morbidity**		
40,001-50,000	21	7.0	None	18	6
More than 50,000	30	10.0	Yes	282	94
Type of Lung cancer			One co-morbidity	208	69.3
NSCLC	292	97.3	Hypertension	141	47.0
SCLL	8	2.7	Diabetes	38	12.7
Chemotherapy regimens			Heart disease	6	2.0
Carboplatin and Gemcitabine	179	59.7	BPH	8	2.7
Placlitaxel and Carboplatin	75	25.0	Dyslipidemia	4	1.3
(Anzatax)			COPD	2	0.7
Alimta	19	6.3	Gout	2	0.7
Doxetaxol or Taxotere	12	4.0	Two co-morbidities	41	13.7
Etoposide and Cisplatin	2	0.7	Three co-morbidities	30	10.0
Etoposide and Carboplatin	7	2.3	Four co-morbidities	3	1.0
Cisplatin and Vinerebine	6	2.0			

Table 2 Rank of symptom prevalence, frequency, severity and distress of patients with advanced lung cancer.

Symptoms	Prevalence		Frequency		Severity		Distress	
	N	%	Mean	SD	Mean	SD	Mean	SD
Lack of appetite	245	**81.7**[1]	2.84[2]	0.57	**2.56**[1]	0.75	2.68[2]	0.68
Lack of energy	234	78.0[2]	2.58[4]	0.96	2.34[6]	0.70	2.38[7]	0.79
Constipation	211	70.3[3]	-	-	2.48[4]	0.80	**2.70**[1]	0.83
Dry mouth	200	66.7[4]	2.42[7]	0.93	1.88[23]	0.70	1.63[23]	0.75
Change in the way food taste	188	62.7[5]	-	-	2.40[5]	0.68	2.34[10]	0.85
Shortness of breath	186	62.0[6]	2.30[9]	0.60	2.16[12]	0.60	2.31[11]	0.69
Problem with urination	183	61.0[7]	**2.84**[1]	0.57	1.98[18]	0.70	1.58[25]	0.85
I don't look like myself	181	60.3[8]	-	-	2.07[15]	0.95	1.99[18]	1.08
Cough	176	58.7[9]	2.16[12]	0.85	1.90[21]	0.76	2.12[16]	0.87
Pain	170	56.7[10]	2.42[7]	0.92	2.28[7]	0.70	2.56[3]	0.80
Difficulty sleeping	165	55.0[11]	2.45[6]	0.89	2.25[9]	0.81	2.38[8]	0.87
Feeling drowsy	156	52.0[12]	2.32[8]	0.94	1.90[22]	0.75	1.53[26]	0.97
Hair loss	156	52.0[13]	-	-	2.52[3]	1.17	1.99[17]	1.16
Nausea	151	50.3[14]	2.00[16]	0.93	2.07[14]	0.85	2.24[13]	0.89
Dizziness	147	49.0[15]	2.12[13]	0.80	2.08[13]	0.78	2.13[15]	0.80
Feeling bloated	146	48.7[16]	2.42[7]	0.83	2.17[11]	0.80	2.36[9]	0.81
Numbness/tingling in hand/feet	143	47.7[17]	2.73[3]	1.00	1.93[19]	0.86	1.68[22]	0.84
Feeling irritable	141	47.0[18]	2.02[15]	0.76	1.57[29]	0.72	1.49[28]	0.82

Table 2 Rank of symptom prevalence, frequency, severity and distress of patients with advanced lung cancer. (Continued)

Symptoms	Prevalence		Frequency		Severity		Distress	
	N	%	Mean	SD	Mean	SD	Mean	SD
Weight loss	139	46.3[19]	-	-	1.92[20]	0.86	1.49[27]	0.86
Itching	123	41.0[20]	1.97[18]	0.90	1.77[26]	0.83	1.93[20]	0.83
Worrying	115	38.3[21]	2.24[10]	0.80	2.23[10]	0.75	2.41[5]	0.83
Vomiting	97	32.3[22]	1.86[20]	0.94	1.99[17]	0.84	2.23[14]	0.92
Change in skin	97	32.3[23]	-	-	1.54[30]	0.65	1.25[31]	0.63
Difficulty concentrating	88	29.3[24]	1.97[17]	0.76	1.60[28]	0.69	1.35[29]	0.71
Feeling nervous	75	25.0[25]	2.52[5]	0.83	2.28[8]	0.83	2.49[4]	0.83
Problems with sexual interest or activity	75	25.0[26]	1.59[21]	0.72	1.98[32]	0.70	0.94[32]	0.58
Mouth sores	74	24.7[27]	-	-	1.69[27]	0.68	1.78[21]	0.64
Diarrhea	36	12.0[28]	2.12[22]	0.85	1.50[31]	0.70	1.62[24]	0.80
Feeling sad	33	11.0[29]	1.88[19]	1.02	1.82[25]	0.95	1.94[19]	1.02
Sweats	22	7.3[30]	2.05[14]	0.79	2.00[16]	0.82	2.30[12]	1.03
Swelling of arms of legs	18	6.0[31]	-	-	1.83[24]	1.10	1.29[30]	0.68
Difficulty swallowing	13	4.3[32]	2.23[11]	0.60	2.54[2]	0.66	2.40[6]	0.92

Note: 1-30 = Ranking of symptom prevalence, frequency, severity, and distress, the first ranking of all dimensions are bolded

Symptom Clustering

There were five symptom clusters in the severity dimension accounting for 42.53% of the variance explained in all the symptoms. These clusters were 'Emotional-elimination discomfort', 'Anorexia-related', 'Treatment-related gastrointestinal and others', 'Neurological and body image', and 'Respiratory and sleep disturbance'. (Table 3).

Table 3 A summary of symptom cluster of severity (N=300)

Name of a symptom cluster	Symptoms contained in each cluster	Factor loading	Eigen value	Variance explained (%)
1. Emotional-elimination discomfort	Feeling irritable	0.632	3.84	10.16
(7 symptoms)	Feeling drowsy	0.552		
	Feeling bloated	0.547		
	Dizziness	0.524		
	Problems with urination	0.475		
	Constipation	0.428		
	Changes in skin	0.411		
2. Anorexia-related (3 symptoms)	Dry mouth	0.665	1.85	8.70
	Change in the way food tastes	0.653		
	Lack of appetite	0.612		

Table 3 A summary of symptom cluster of severity (N=300) (Continued)

Name of a symptom cluster	Symptoms contained in each cluster	Factor loading	Eigen value	Variance explained (%)
3.Treatment-related gastrointestinal and other (3 symptoms)	Nausea	0.749	1.49	8.63
	Vomiting	0.722		
	Hair loss	0.450		
4. Neurological and body image (5 symptoms)	Numbness/tingling in hands/ feet	0.571	1.33	7.76
	"I don't look like myself"	0.504		
	Pain	0.471		
	Worrying	0.457		
	Weight loss	0.432		
5. Respiratory and sleep disturbance (3 symptoms)	Shortness of breath	0.599	1.29	7.28
	Cough	0.572		
	Difficulty sleeping	0.527		
Total Variance Explained (%)				**42.53**

There were five clusters in the distress dimension formed into five clusters accounting for 43.69% of variance explained in all the symptoms, and these were: 'Emotional-elimination discomfort', 'Body image', 'Anorexia-related', 'Treatment-related gastrointestinal and other', and 'Treatment-related neurological and other'. (Table 4)

Table 4 A summary of symptom cluster of distress (N=300)

Name of a symptom cluster	Symptoms contained in each cluster	Factor loading	Eigen value	Variance explained (%)
Emotional, elimination and respiratory (6 symptoms)	Feeling irritable	0.589	4.10	10.54
	Feeling bloated	0.570		
	Problems with urination	0.549		
	Constipation	0.523		
	Shortness of breath	0.519		
	Worrying	0.471		
Body image (4 symptoms)	"I don't look like myself"	0.592	1.93	9.01
	Hair loss	0.580		
	Itching	0.492		
	Changes in skin	0.457		
Anorexia-related (4 symptoms)	Lack of appetite	0.742	1.467	8.77
	Change in the way food tastes	0.682		
	Dry mouth	0.566		
	Lack of energy	0.509		

Table 4 A summary of symptom cluster of distress (N=300) (Continued)

Name of a symptom cluster	Symptoms contained in each cluster	Factor loading	Eigen value	Variance explained (%)
Treatment-related gastrointestinal and other (3 symptoms)	Nausea	0.769	1.33	8.40
	Vomiting	0.747		
	Dizziness	0.462		
Treatment-related neurological and other (3 symptoms)	Numbness/tingling in hands/feet	0.656	1.23	6.97
	Weight loss	0.554		
	Difficulty sleeping	0.405		
Total Variance explained (%)				43.69

Although the number of clusters was equal between the two dimensions of symptoms, they were different in terms of cluster characteristics. Four clusters in the severity dimension and those in the distress dimension were compared. The 'Anorexia-related' cluster was almost the same in both dimensions. The other clusters were partially similar. (Table 5) However, the 'Respiratory and sleep disturbance' symptom cluster in severity dimension cannot be compared with the 'Body image' symptom cluster in distress dimension. In severity dimension, the 'Respiratory and sleep disturbance' cluster comprised shortness of breath, cough, and difficulty sleeping which formed together as cluster, whereas all of these symptoms existing in separate cluster in distress dimension. Therefore, those two clusters were not compared or included in Table 5. Similarity and dissimilarity of the symptoms within each cluster between the two dimensions are compared in Table 5.

Table 5 The similarities and dissimilarities clustering of symptoms across clustering of symptoms across dimension between symptom severity and symptom distress

Factor Structure	Symptom Severity	Symptom Distress	Comparison
Number of Cluster	5	5	Identical
	Emotional-elimination discomfort symptoms cluster (7 symptoms)	**Emotional-elimination discomfort symptoms cluster** (6 Symptoms)	**Partially Similar**
	1) Feeling irritable	1) Feeling irritable	
	2) Feeling bloated	2) Feeling bloated	
	3) Problems with urination	3) Problems with urination	
	4) Constipation	4) Constipation	
	5) Feeling drowsy	5) Shortness of breath	
	6) Dizziness	6) Worrying	
	7) Changes in skin		
	Anorexia-related symptoms cluster (3 symptoms)	**Anorexia-related symptoms cluster** (4 symptoms)	**Almost Similar**
	1) Dry mouth	1) Dry mouth	
	2) Change in the way food tastes	2) Change in the way foo tastes	
	3) Lack of appetite	3) Lack of appetite	
		4) Lack of energy	

Table 5 The similarities and dissimilarities clustering of symptoms across clustering of symptoms across dimension between symptom severity and symptom distress (Continued)

Factor Structure	Symptom Severity	Symptom Distress	Comparison
	Treatment-related gastrointestinal and other symptoms cluster (3 Symptoms) 1) Nausea 2) Vomiting 3) Hair loss	**Treatment-related gastrointestinal and other symptoms cluster** (3 Symptoms) 1) Nausea 2) Vomiting 3) Dizziness	**Partially Similar**
	Neurological and body image symptoms cluster (5 Symptoms) 1) Numbness/tingling in hands/feet 2) Weight loss 3) I don't look like myself 4) Pain 5) Worrying	**Treatment-related neurological and other symptoms cluster** (3 symptoms) 1) Numbness/tingling in hands/feet 2) Weight loss 3) Difficulty sleeping	**Partially Similar**

Discussion

Our findings demonstrate that PWALC undergoing chemotherapy experienced multiple symptoms rather than a single symptom. Of the 32 symptoms assessed, participants reported an average of 13.95 symptoms, which ranged from 3-26 symptoms during the disease and treatment phases. This result is congruent with the study by Pudthong et al.[15] who found that PWALC experienced 2-32 symptoms with a mean of 14.65 symptoms. In addition, these researchers weighted their symptoms differently across symptom dimensions. This finding supports the TOUS in that symptom experiences are multidimensional. In the TOUS, symptoms are conceptualized as manifesting multiple variable and measurable dimensions. It is asserted that all symptoms vary in frequency or timing, intensity or severity, and degree of associated distress. These dimensions are also related to one another. Our findings demonstrate that the symptoms experienced by the participants were complex and multidimensional. They experienced a variety of symptoms. The perceptions of symptoms were different among the dimensions of prevalence, frequency, severity, and distress. This study also confirmed findings from previous studies[2,15,20] in that the symptoms reported as most prevalent were not necessarily the most frequent, severe, or distressful. For example, in this study, dry mouth was rated as the top of the five most prevalent symptoms, but was not rated as the top of the five most severe symptoms and distressing symptoms. One explanation could be that 'dry mouth' may be a result of chemotherapy and vomiting-reducing medications. The participants reported that when experiencing dry mouth, they drank plenty of fluids and were not bothered much by this symptom. In another example, problems with urinary and numbness/tingling in hands/feet were rated as the top of the five most frequent symptoms, but were not reported as the top of the five in the other symptom dimensions. Likewise, difficulty swallowing, hair loss, and change in food taste were rated as the top of the five most severe symptoms, but were not reported as the top of the five most distressing symptoms. Interestingly,

our study, and previous Thai studies on lung cancer[15, 20] and other types of cancers[7, 8, 13] found that persons with cancer experience problems with interest in sexual activity in a range of 0-25%. This symptom was not rated as the top of the five of all symptom dimensions. Inconsistent with a study overseas[21] that persons with lung cancer experienced lack of sexual interest 31%, but they rated this symptom as the most severe symptom. This result can be explained by cultural differences. In Thai culture, the topic related to sex activity or sexuality is delicate issues. Many Thai people are not comfortable to discuss this issue openly because they think that it is private and a very personal issue. Therefore, they do not have the courage to talk with others about this symptom. This might have resulted in the low scoring for this symptom.

For symptom cluster, the findings from this study confirmed those of previous studies[2, 15, 19, 21] in that symptom clusters existed in PWALC receiving chemotherapy. Five symptom clusters were identified in the severity and distress dimensions. The comparison of the specific symptom clusters identified in this study and the previous studies revealed some similarities as well as some distinct differences. For severity dimension, it was noticed that some symptom clusters found in previous studies did not exist in this study such as the groups of breathlessness, fatigue, and anxiety, [3] the groups of fatigue and depression, [10] and the groups of pain, fatigue, and insomnia.[27] This can be explained that those studies were more likely selected different symptoms having associations to each other. The researchers chose common symptoms before empirical analysis, presumably on the basis of clinical observations, then calculated correlations among the symptoms and define a cluster based on the co-occurrence of selected related symptoms. Rather, in this study any potential symptoms those PWALC experience are considered in cluster identification. Likewise, the symptom cluster which was not reported in previous studies, but have been found in the current study was the 'Emotional-elimination discomfort' which contained feeling irritable, feeling bloated, problems with urination, constipation, feeling drowsy, dizziness, and changes in skin. The researchers in previous studies identified symptom cluster using the most common symptom approach which focused on a few symptoms empirically considered clinically important.[3, 10, 27] Rather, this current study identified symptom cluster by including all-possible symptoms considered as potential symptoms that PWALC might experience during chemotherapy treatment. Therefore, the absence of emotional clinical cluster in the previous studies might be because they were not included in list of assessment. Obviously, numbers and types of symptoms of each instrument used to assess symptoms play significant roles in identifying symptom clustering. Additionally, clustering type and composition depends on the participant's characteristics, disease stage, assessment method, instrument, timeframe, and statistical method.[28, 29, 30]

For distress dimension, the symptoms have not been reported as a symptom cluster in previous studies but reported in the current study were numbness/tingling in hands/feet, weight loss, and difficulty sleeping which formed together as a cluster of 'Treatment-related neurological and other'. In previous studies, all of these symptoms existing in separate cluster with their own distinct names. Interestingly, both of this study and previous studies found that nausea and vomiting crusted consistently. Dyspnea (breathlessness) also consistently clusters with cough[24] and also clusters with insomnia problem.[5]

In sum, the structures of symptom clustering are varies even in homogeneous sample. Differences in the composition of the clusters may be related to differences in the instruments used to assess the symptoms, the number of symptoms to be included in assessment list, analytical methods, and the sample's conditions cause the differences in the patterns of symptom clusters.[27] This notion also was confirmed by previous studies which found that structures of symptom clustering were varies even in homogenous sample.[15, 30, 31]

For symptom cluster across symptom dimensions, the results showed that symptom clusters occurred in severity and distress dimensions were not identical. They were different in terms of characteristics of the clusters. The results revealed some almost similarities, as well as partial similarity. For instance, the 'Anorexia-related' symptoms cluster existed almost the same across symptom dimensions. In symptom severity dimension, the 'Respiratory and sleep disturbance' symptoms cluster composed of shortness of breath, cough, and difficult sleeping which formed together as cluster, whereas all of these symptoms existing in separate cluster in distress dimension. These results can be explained by the homogeneity of this cluster in that the dimension of symptoms was not strong enough. Symptoms in this cluster then can aggregate with other symptoms in distress dimension. This result was consistent with a previous study by Kim et al.[30] who evaluated the differences in symptom clusters in a homogeneous sample of oncology patients receiving radiotherapy using both the occurrence and severity dimensions of the MSAS. The results showed that although the specific symptoms within each cluster were not identical, there were three similar symptom clusters identified regardless of whether occurrence or severity dimensions were used. In addition, Suwisith et al.[7] reported that symptom clusters in severity and distress dimensions in persons with breast cancer were not identical. They were different in terms of the number of factors existed. However, the characteristics of the clusters were almost similar.

The different existence of symptom clusters between severity dimension and distress dimension might be discussed with their conceptual differences. Symptoms themselves are unstable by nature as various factors can influence how an individual perceives and interprets them. Symptom severity is the dimension that quantifies the degree, strength, or severity of the symptom[21] which involves human interpretation and the meaning given to the perceived symptom[12], whereas symptom distress refers to the degree to which the individual experiencing the symptom is bothered by it.[21] This finding was consistent with a study of Goddell and Nail[31] who operationalized the concept of symptom distress using a literature synthesis and confirmed that symptom distress distinct from symptom severity. However, these two symptom dimensions, to some degree, might overlap and share some similar processes of participants' interpretation. Therefore, it might be possible for the similarity of symptom clusters across symptom dimensions.

Limitations

The limitations are related to methodology and methods of data analysis. The generalization of the results from this study may be limited by the use of a convenience sample. Also, a study using cross-sectional design limited the data to only one point in time. This study, therefore, was unable to demonstrate a pattern of symptom experiences over time. In addition, data regarding symptoms using the MSAS were assessed from the PWALC coming to the hospital for receiving next cycle of chemotherapy when the symptoms were generally relieved. Given the limitations of this study, the results should be generalized with caution.

Conclusions and Implications

The findings of this study revealed that PWALC receiving chemotherapy experienced multiple co-existing symptoms which were grouped together as a cluster. Symptom experiences and symptom clusters existed differently across symptom dimensions. Thus, in practice, nurses should select tools that identify multiple symptoms and define their co-occurrence as well as focus on management of symptoms as a cluster rather than a single symptom. The regular use of multidimensional and comprehensive symptom assessment tools is suggested for assessment of prevalence, frequency, severity, and distress of the symptoms before, during and after treatment. Future

studies need to consider the use of a longitudinal design to identify symptom patterns that might change over time, along the disease and treatment trajectories as well as to determine the influence of symptom cluster on the outcome such as functional status. In addition, the methods and effects of intervention for symptom clusters require extra examination.

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ประสบการณ์การมีอาการ และกลุ่มอาการของผู้ป่วยมะเร็งปอดระยะลุกลามที่ได้รับการรักษาด้วยเคมีบำบัด

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บทคัดย่อ: การศึกษาครั้งนี้วัตถุประสงค์เพื่อศึกษาประสบการณ์การมีอาการ และโครงสร้างของกลุ่มอาการของผู้ป่วยมะเร็งปอดระยะลุกลามที่ได้รับการรักษาด้วยเคมีบำบัด ใช้วิธีคัดเลือกกลุ่มตัวอย่างแบบสะดวก กลุ่มตัวอย่างเป็นผู้ป่วยมะเร็งปอดระยะลุกลามจำนวน 300 คนที่มารับยาเคมีบำบัด ณ โรงพยาบาลมหาวิทยาลัยและโรงพยาบาลมะเร็งในกรุงเทพมหานครเครื่องมือที่ใช้ได้แก่ แบบบันทึกข้อมูลส่วนบุคคล และแบบประเมินอาการจากโรคและการรักษา วิเคราะห์ข้อมูลโดยใช้สถิติบรรยายการศึกษาประสบการณ์การมีอาการ สถิติการวิเคราะห์ปัจจัยในการศึกษาองค์ประกอบของกลุ่มอาการ

ผลการศึกษาพบว่าผู้ป่วยมะเร็งปอดระยะลุกลามเกิดอาการหลายอาการร่วมกัน อาการไม่อยากอาหารพบมากที่สุดและมีความรุนแรงมากที่สุด อาการมีปัญหาเวลาปัสสาวะพบมีความถี่ในการเกิดบ่อยครั้งที่สุดและอาการท้องผูกเป็นอาการที่ทุกข์ทรมานมากที่สุดกลุ่มอาการในมิติความรุนแรงและมิติความทุกข์ทรมานมีความแตกต่างกันในการวิเคราะห์จัดกลุ่มอาการสามารถจำแนกได้ 5 กลุ่มทั้งในมิติความรุนแรงและความทุกข์ทรมาน อย่างไรก็ตามอาการถูกจัดอยู่ในแต่ละกลุ่มและมีชื่อของกลุ่มอาการค่อนข้างแตกต่างกัน กลุ่มอาการในมิติความรุนแรง ได้แก่ กลุ่มอาการด้านอารมณ์-ความไม่สุขสบายในการขับถ่าย กลุ่มอาการที่เกี่ยวข้องกับภาวะไม่อยากอาหาร กลุ่มอาการระบบทางเดินอาหารและอาการอื่นๆที่เกี่ยวข้องกับการรักษา กลุ่มอาการด้านระบบประสาทและภาพลักษณ์ กลุ่มอาการด้านระบบทางเดินหายใจและการนอนหลับแปรปรวน กลุ่มอาการด้านระบบประสาทและอาการอื่นๆที่เกี่ยวข้องกับการรักษา ในขณะที่กลุ่มอาการในมิติความทุกข์ทรมาน ได้แก่ กลุ่มอาการด้าน อารมณ์-ความไม่สุขสบายในการขับถ่าย กลุ่มอาการด้านภาพลักษณ์ กลุ่มอาการที่เกี่ยวข้องกับภาวะไม่อยากอาหาร กลุ่มอาการระบบทางเดินอาหารและอาการอื่นๆที่เกี่ยวข้องกับการรักษา กลุ่มอาการด้านระบบประสาทและอาการอื่นๆที่เกี่ยวข้องกับการรักษางานวิจัยต่อไปในอนาคตควรศึกษาประสบการณ์การเผชิญอาการในระยะยาวที่อาจเปลี่ยนแปลงตามระยะเวลา ระยะของโรค และการรักษา ข้อมูลที่ได้จากการศึกษาในครั้งนี้สามารถนำไปใช้ประโยชน์ในการพัฒนาโปรแกรมสำหรับการจัดการกับกลุ่มอาการที่มีความเกี่ยวข้องของสาเหตุชักนำร่วมกัน

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คำสำคัญ: ประสบการณ์การมีอาการ กลุ่มอาการ ผู้ป่วยมะเร็งปอด เคมีบำบัด คนไทย

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