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## The role of leader behaviors in hospital-based emergency departments' unit performance and employee work satisfaction

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### ABSTRACT

The role of the leader of a medical unit has evolved over time to expand from simply a medical role to a more managerial one. This study aimed to explore how the behavior of a hospital-based emergency department's (ED's) leader might be related to ED unit performance and ED employees' work satisfaction. One hundred and twelve hospital-based EDs in Taiwan were studied: 10 in medical centers, 32 in regional hospitals, and 70 in district hospitals. Three instruments were designed to assess leader behaviors, unit performance and employee satisfaction in these hospital-based EDs. A mail survey revealed that task-oriented leader behavior was positively related to ED unit performance. Both task- and employee-oriented leader behaviors were found to be positively related to ED nurses' work satisfaction. However, leader behaviors were not shown to be related to ED physicians' work satisfaction at a statistically significant level. Some ED organizational characteristics, however, namely departmentalization and hospital accreditation level, were found to be related to ED physicians' work satisfaction.

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### Introduction

In health care, the leader role in medical units has evolved from solely medical to more managerial as well (Maddux, Maddux, & Hakim, 2008). It has been noted that leadership styles are important in transforming, creating meaning, and producing desirable employee outcomes; thus they can benefit organizational performance and even survival (McNeese-Smith, 1995). Leadership styles have been shown to be related to, named several, hospital financial performance and organizational culture (Khalik, Walston, & Thompson, 2007); employee behaviors such as employee work attendance (Dellve, Skagert, & Vilhelmsson, 2007; Rubin & Stone, 2010); employee productivity and performance (Carmeli, Ben-Hador, Waldman, & Rupp, 2009; Chiok Foong Loke,

2001); employee well-being in the workplace such as the degree of work stress (Hintsä, Hintsanen, Jokela, Pulkki-Räback, & Keltikangas-Järvinen, 2010), employee health (Lohela, Björklund, Vingård, Hagberg, & Jensen, 2009), and job satisfaction (Chiok Foong Loke, 2001; Jenkins & Stewart, 2010; Sellgren, Ekvall, & Tomson, 2008).

The emergency department (ED), an ever-changing, high-velocity, and critical care environment, involves complex interactions between staff members in providing and organizing patient care (Creswick, Westbrook, & Braithwaite, 2009). For health professionals in a time of chaotic and unpredictable health care, leadership is especially vital between leaders and their employees (Jackson, Clements, Averill, & Zimbardo, 2009). It has been pointed out that a successful ED relies not only on its leaders' cognitive aptitude, experience, and acquired technical skills, but also on behavioral characteristics and ability to manage relationships effectively (Propp, Glickman, & Uehara, 2003). Leadership in emergency medicine has been viewed as the single most critical factor in the successful implementation of a program, to achieve all the gains it

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has promised in the quality of patient care and enhancing professional confidence (Kilroy, 2006; LaSalle, 2004; Worthington, 2004).

How ED leader behaviors might be related to ED effectiveness has been little explored. One previous study with a small sample size (i.e., 15 ED nurse managers and 30 staff nurses) found lower staff nurse turnover with transformational leadership style than with non-transformational leadership styles (Raup, 2008). Nevertheless, empirical knowledge of the role of leadership on ED outcomes remains limited. This study aimed to understand how leader behaviors might relate to unit performance and employee satisfaction in hospital-based EDs. Specifically, we tried to identify what types of leader behaviors could be related to better unit performance and employee satisfaction.

## Methods

The Taiwan National Health Research Institute approved the three-year project (2003–2005) of social and organizational research on hospital-based EDs: their culture, conflict management, coordination, communication, leadership, power dynamics, patient safety, employee satisfaction, and department performance. All the research processes were affirmed and assisted by one administrator in the funding organization. All the study processes were monitored by the Institutional Review Board (IRB) of the project executing organization.

This study was part of the national project exploring the role of ED leader behaviors in ED outcomes, using the individual hospital-based ED as the unit of analysis. Hospital-based EDs are the only medical units in Taiwan that provide emergency care for all populations. Not being independent facilities as in some countries, the EDs in Taiwan belong to and are under the control of their hospital organizations. Hospital-based EDs in Taiwan are one of the channels for a hospital's admission of outpatients and inpatients, and they coordinate tightly with other hospital clinical departments. Each has one director, a physician leader. The duties of an ED director include clinical and administrative tasks of the ED and overseeing and encouraging the growth of the emergency care services. Usually, however, one nurse leader in each hospital-based ED assists the physician director in clinical and administrative tasks.

### Study design and study participants

This was a cross-sectional study using a mailed survey. The 385 hospital-based EDs listed in the Taiwan Hospital Accreditation List 2002 run 24 h a day, seven days a week, were identified. The 112 hospital-based EDs that completed the survey on ED leadership, ED unit performance and ED employee satisfaction were analyzed.

The three questionnaires: ED leadership, ED unit performance, and ED employee satisfaction used in this study are described in the section on survey instruments. In the survey process, the 112 hospital-based EDs' directors helped us by distributing the survey questionnaires to their staff members. Since the numbers of personnel vary among the hospital-based EDs according to the level of hospital accreditation, the investment of emergency care resources and the emergency patient volume, non-proportional probability sampling was used in selecting four individual ED employees (i.e., 2 emergency physicians and 2 emergency nurses) to receive the individual survey questionnaires (See Appendix for sample size estimation for each questionnaire) (Chiok Foong Loke, 2001; Failla & Stichler, 2008; Larsson, 2006; Molero, Cuadrado, Navas, & Morales, 2007).

We set a rule for the ED directors' choices of their staff to participate in the survey: emergency physicians and nurses, respectively, were selected as having the next one, two, three, and so on birthdays, to avoid selection bias. If a selected staff member declined to participate, the staff member with the next birthday was

selected. Such random selection of individual respondents to fill out each of the three instruments can avoid the common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). We have no information from the recruited ED directors on the reject rates, though we do have information from them reporting high participation in our study. After completing the questionnaires, the surveyed staff members (physicians and nurses) returned them to their ED directors in sealed envelopes, to avoid social desirability and preserve respondent confidentiality. We then collected the returned questionnaires. The process yielded 1344 completed questionnaires (112 participating EDs \* 3 instruments \* 4 employees for each instrument).

## Survey instruments

Three instruments (survey questionnaires) were designed for this study, to capture information on leadership, unit performance and employee satisfaction in hospital-based EDs.

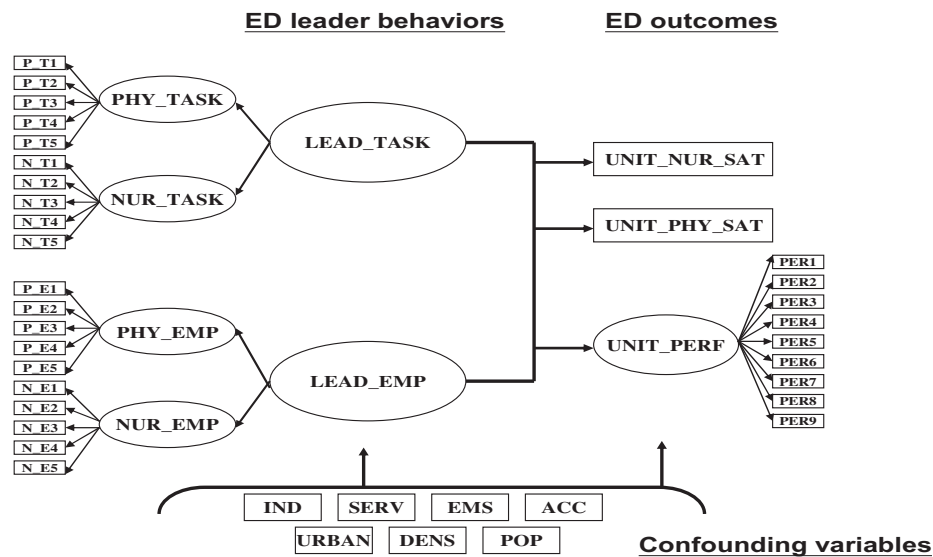
### ED leadership questionnaire

A systematic model for EDs was proposed for medical directors' development and communication of appropriate expectations of performance, as an aspect of successful leadership (Vidrine, 2004). The model included expressing performance expectations explicitly across the dimensions of medical practices, measuring critical performance, and managing both marginal and exceptional performers to maintain the functional integrity of EDs. Effective leaders are those whom their followers regard as properly qualified, who are able to develop personal bonds with their followers, and who can use their own knowledge and that of the group for collective accomplishments (Estabrooks et al., 2004). Effectiveness goes beyond traditional technical performance to include individual feedback for social integration. In this study, on the basis of previous literature (Chiok Foong Loke, 2001; Cook & Leathard, 2004; Judge, Piccolo, & Ilies, 2004; Shortell, Rousseau, Gillies, Devers, & Simons, 1991; Vidrine, 2004), and using in-depth interviews with hospital-based EDs medical directors and with the focus group of emergency physicians and nurses for content validity, 10 question items were formulated about the leader behavior of emergency physicians and nurse leaders, respectively (see Table 2 for the detailed survey items). The questions cover unit goals, work expectation, work standardization to the staff, response to changing needs and situations, concerns and feedbacks, and being creative and active.

Since hospital-based EDs' in Taiwan usually are staffed with physicians and nurse leaders as a team, we explored ED leadership from both physician and nurse leader perspectives. Question items on ED physician and nurse leadership were measured on a Likert 5-point scale with 1 as "strongly disagree," 3 as neutral, and 5 as "strongly agree." At each of the EDs surveyed, the leadership questionnaire was given to four selected ED employees who ranked their ED physician and nurse leaders' behaviors, respectively. The rankings by the four selected ED employees were then aggregated to represent the ED physician and nurse leaders' behaviors, respectively, at the unit of the individual ED.

The factor analyses confirm the construct validity of the measures of leader behaviors. For the measures of physician leadership (ten question items), a factor analysis was performed with Principal Component Analysis as the basis and Varimax with Kaiser Normalization as the rotation method. Two common factors were identified: task-oriented physician leadership (PHY\_TASK) and employee-oriented physician leadership (PHY\_EMP). For the measures of nurse leadership (ten question items), a factor analysis was performed with Principal Component Analysis as the basis and Varimax with Kaiser Normalization as the rotation method. Two

UOA: individual EDs



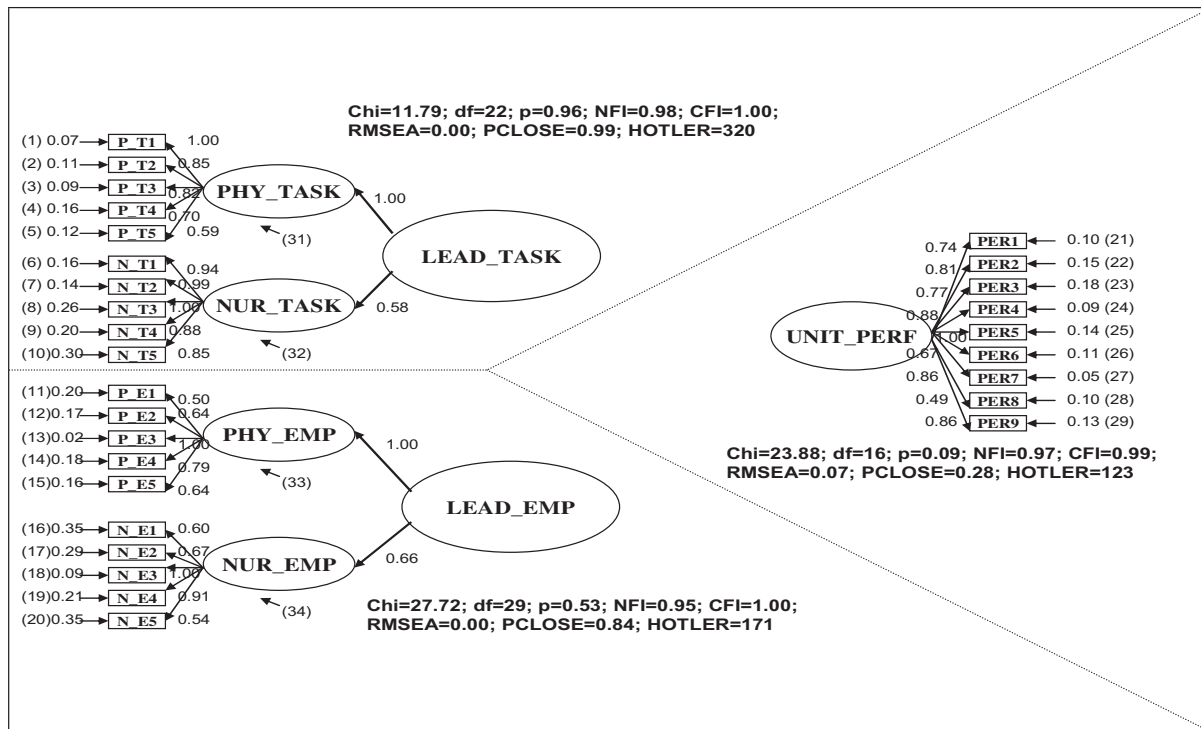
Variables	Labels	Definitions
<b>ED leader behaviors</b>		
Task-oriented leader behaviors in EDs	LEAD_TASK	Second-order latent variable
Employee-oriented leader behaviors in EDs	LEAD_EMP	Second-order latent variable
Task-oriented physician leader behaviors in EDs	PHY_TASK	First-order latent variable, measured by five items (P_T1~P_T5) with 5-point Likert scales (see Table 2 for detailed question items)
Task-oriented nurse leader behaviors in EDs	NUR_TASK	First-order latent variable, measured by five items (N_T1~N_T5) with 5-point Likert scales (see Table 2 for detailed question items)
Employee-oriented physician leader behaviors in EDs	PHY_EMP	First-order latent variable, measured by five items (P_E1~P_E5) with 5-point Likert scales (see Table 2 for detailed question items)
Employee-oriented nurse leader behaviors in EDs	NUR_EMP	First-order latent variable, measured by five items (N_E1~N_E5) with 5-point Likert scales (see Table 2 for detailed question items)
<b>ED outcomes: unit performance</b>		
Perceived performance in EDs	UNIT_PERF	Latent variable, measured by nine items (PER1~PER9) with 5-point Likert scales (see Table 2 for detailed question items)
<b>ED outcomes: employee satisfaction</b>		
Adjusted emergency physician satisfaction in EDs	UNIT_PHY_SAT	Emergency physicians' work satisfaction scored as 0-100, adjusted for emergency physicians' backgrounds (see Table 2 note)
Adjusted emergency nurse satisfaction in EDs	UNIT_NUR_SAT	Emergency nurses' work satisfaction scored as 0-100, adjusted for emergency nurses' backgrounds (see Table 2 note)
<b>ED characteristics (confounding variables)</b>		
ED: departmentalization	IND	Whether the ED as an independent division in a hospital or not
ED: service lines provided	SERV	Number of service lines provided by the ED
ED: regional emergency network	EMS	Whether the ED joining the regional emergency network or not
ED: hospital accreditation level	ACC	Hospital accreditation levels: medical center, regional hospital, or district hospital. (designed as dummy variables)
<b>ED environments (confounding variables)</b>		
Area population	POP	Population at county/city level.
Urbanization	URBAN	Urbanization: 0=rural; 1=suburban; 2=urban.
Medical density	DENS	Number of health care organization per 10,000 population in area (county/city level)

Fig. 1. Model for testing the relationship between hospital-based ED leader behaviors and ED outcomes.

common factors were identified: task-oriented nurse leadership (NUR\_TASK) and employee-oriented nurse leadership (NUR\_EMP). All the factor loadings of factor analyses for the question items (measured variables) are shown in Table 2. The Cronbach  $\alpha$  values for leader behaviors are also shown in Table 2, with a range from 0.84 to 0.88.

*ED unit performance questionnaire*

Leadership is challenged and has opportunities at every level in emergency medicine: every patient encounter, meeting department needs, integration with hospital strategic imperatives, meeting community needs, and relating a specialty to academic



Note:

1. Variable labels are shown in Figure 1.
2. For individual measurement models of task-oriented leadership (LEAD\_TASK), employee-oriented leadership (LEAD\_EMP), and ED unit performance (UNIT\_PERF), several indicator errors had covariance each other and are as follows: (1) $\leftrightarrow$ (6), (2) $\leftrightarrow$ (7), (2) $\leftrightarrow$ (4), (4) $\leftrightarrow$ (5), (4) $\leftrightarrow$ (9), (4) $\leftrightarrow$ (10), (5) $\leftrightarrow$ (7), (5) $\leftrightarrow$ (10), (6) $\leftrightarrow$ (7), (7) $\leftrightarrow$ (10), (8) $\leftrightarrow$ (10), (9) $\leftrightarrow$ (10) in LEAD\_TASK measurement model; (11) $\leftrightarrow$ (14), (12) $\leftrightarrow$ (17), (13) $\leftrightarrow$ (20), (15) $\leftrightarrow$ (20), (16) $\leftrightarrow$ (17) in LEAD\_EMP measurement model; and (21) $\leftrightarrow$ (27), (22) $\leftrightarrow$ (27), (22) $\leftrightarrow$ (26), (23) $\leftrightarrow$ (25), (24) $\leftrightarrow$ (25), (24) $\leftrightarrow$ (26), (24) $\leftrightarrow$ (27), (25) $\leftrightarrow$ (27), (25) $\leftrightarrow$ (29), (26) $\leftrightarrow$ (27), (26) $\leftrightarrow$ (28) in UNIT\_PERF measurement model; (31) $\leftrightarrow$ (33) and (32) $\leftrightarrow$ (34) across the measurement models of LEAD\_TASK and LEAD\_EMP in the structural equation modeling in Table 3.

Fig. 2. . Measurement model of latent constructs: leader behaviors and unit performance in hospital-based EDs

institutions and professional associations. It has been also noted that the primary goal of ED leadership, whether stated or implied, is to ensure excellence in professional performance for patient care (LaSalle, 2004). In this study, nine questions to measure ED performance were developed on the basis of previous studies (Judge et al., 2004; Propp et al., 2003; Vidrine, 2004) together with in-depth interviews with hospital-based EDs' medical directors and the focus group of emergency physicians and nurses, for content validity. The nine question items concerned goal achievements in meeting the needs of emergency patients, such as life-saving timing and the quality of care, and goals in organizational services, research and teaching, teamwork and performance in comparison with peers.

The nine question items for the constructs of ED unit performance were measured by a Likert 5-point scale with 1 as "strongly disagree," 3 as neutral, and 5 as "strongly agree." The rationales for using subjective performance indicators (Dess & Robison, 1984; Govindrajana & Fisher, 1990) are: 1) objective measures of organizational performance sometimes cannot be gathered consistently; 2) providers can be unwilling to furnish accurate information because of trade security; and 3) varying definitions of financial indicators across healthcare facilities may lead to misunderstandings and incorrect comparisons with the organization's peers due to differences in external environments (i.e., policy, economics, technology) and internal organizational environments (i.e., organizational strategies). For each studied ED, the ED unit performance

questionnaire was given to four selected ED employees who ranked their perceptions of that ED unit's performance. Their rankings were then aggregated to represent the individual ED unit's performance.

The factor analysis confirmed the construct validity of the nine question items of unit performance, and one common factor was identified: unit performance (UNIT\_PERF). All the factor loadings of factor analyses for the question items (measured variables) are shown in Table 2. The Cronbach  $\alpha$  value for unit performance is 0.92.

#### ED employee satisfaction questionnaire

Job satisfaction of the emergency physicians and nurses was measured as each one's overall satisfaction in the ED setting (Cummings et al., 2008; Cydulka & Korte, 2008; Dolbier, Webster, McCalister, Mallon, & Steinhardt, 2005; Lee et al., 2008; Nielsen, Yarker, Brenner, Randall, & Borg, 2008), by one question item scored from 0 to 100. Data on the emergency physicians' and the nurses' personal and employment backgrounds were also collected, including gender, age, education level, employment relationship (coded as permanent or contracted), full-time or part-time employment status in the EDs, clinical and ED working years, and perceived extent of busyness. Since medical professionals' job satisfaction has been shown to be related to their personal and working characteristics (Lin et al., 2008), the individual ED

**Table 1**  
Backgrounds of the studied hospital-based EDs ( $n = 112$ ).

Items	Labels	Study sample ( $n = 112$ )		Study population ( $N = 385$ )	
		Frequency (mean)	% (SD)	Frequency (mean)	% (SD)
<b>ED characteristics</b>					
Departmentalization	IND				
No		25	22.32		
Yes		87	77.68		
Service lines provided	SERV	(5.13)	(2.14)		
Ownership	OWN				
Own and manage		104	92.86		
Outsourcing (part or all)		8	7.14		
Joining regional emergency networks	EMS				
No		11	9.82		
Yes		101	90.18		
Accreditation status	ACC				
Medical center-based		10	8.93	17	4.42
Regional hospital-based		32	28.57	62	16.10
District hospital-based		70	62.50	306	79.48
		$\chi^2 = 12.69$ ; $p = 0.001^a$			
<b>ED environments</b>					
Urbanization	URBAN	(1.45)	(0.73)		
Rural (0)		16	14.29		
Sub-urban (1)		30	26.79		
Urban (2)		66	58.93		
Population (persons)	POP	(1,331,593)	(910,057)		
Medical density	DENS	(10.62)	(1.37)		
Number of health care organizations in area (county/city) (per 10,000 population)					
Medical dispersion	SQUAR	(0.77)	(0.40)		
Number of health care organizations in area (county/city) (per square kilometer)					
Geographical location	LOC				
North area		25	22.32	84	21.82
North-west area		11	9.82	50	12.99
West area		26	23.21	77	20.00
South-west area		16	14.29	73	18.96
South area		25	22.32	92	23.90
East area		9	8.04	9	2.34
		$\chi^2 = 8.84$ ; $p = 0.12^a$			

<sup>a</sup> Difference analysis between sampled (studied) EDs and population EDs:  $p < 0.05$  means there was statistically significant difference between the study sample ( $n = 112$ ) and the study population ( $N = 385$ ).

employees' job satisfaction scores were adjusted for their personal and working characteristics, using multiple regressions. The ED employee satisfaction questionnaire was given to four selected ED employees, who ranked their job satisfaction. The adjusted job satisfaction scores were then aggregated to represent the ED unit's employee satisfaction at the unit of the individual ED.

#### *EDs unit characteristics and environmental factors*

Data were collected on the hospital-based EDs' organizational characteristics and environmental factors, since the resources of EDs varied in patients, personnel, equipment and technology, structure and specialty functions, and community networking (Carius, 2004). ED organizational characteristics were the departmentalization of an ED independent from its hospital's other clinical departments, the service lines the ED provided, whether the ED was a member of a regional emergency network, and its hospital accreditation level (i.e., medical center, regional hospital, or district hospital). An ED's environmental factors were geographical location, area population, area urbanization, and area medical density and dispersion.

#### **Statistical analysis**

The data were first analyzed descriptively, with means and standard deviations calculated for continuous variables, and frequency and percentages for categorical variables. With the individual ED as the unit of analysis, the survey responses from individual physicians and nurses were aggregated to ED levels,

using the averaging method for each question item score on ED leadership, ED unit performance, and adjusted ED employee satisfaction.

Structural equation model (SEM), a multivariate statistical approach, was conducted to test the causal relationship, as shown in Fig. 1. The two parts of SEM are measurement modeling and structural equation modeling. First the measurement model was used to validate how the latent variables were measured by the observed indicators. The four first-order measurement models were of task-oriented behavior and employee-oriented behavior by physician leadership (PHY\_TASK and PHY\_EMP); and of task-oriented behavior and employee-oriented behavior by nurse leadership (NUR\_TASK and NUR\_EMP). Each of the four models was measured by five indicators (question items). The two second-order measurement models were then constructed: for task-oriented leader behavior (LEAD\_TASK) and employee-oriented leader behavior (LEAD\_EMP), the respective pairs of indicators were physician task-oriented and nurse task-oriented (PHY\_TASK and NUR\_TASK) for the former, and physician employee-oriented and nurse employee-oriented (PHY\_EMP and NUR\_EMP) for the latter. Since a physician director in a hospital-based ED usually works as a team with one nurse leader for clinical and administrative tasks, we attributed physician task-oriented and nurse task-oriented (PHY\_TASK and NUR\_TASK) together, and physician employee-oriented and nurse employee-oriented (PHY\_EMP and NUR\_EMP) together for the final second constructs of: task-oriented leader behavior (LEAD\_TASK) and employee-oriented leader behavior (LEAD\_EMP). In addition, the measurement model of ED unit performance was measured by nine indicators. The detailed

**Table 2**  
Descriptive analyses of question items for leadership, performance, and satisfaction in hospital-based EDs.

Question items	Label	Mean	SD	Factor loading	Cronbach $\alpha$
ED physician leadership: what ED physician leader does					
Task-oriented physician leadership					
Common factor 1: PHY_TASK					
1. Specify goals understandable by subordinates	P_T1	3.58	0.52	0.83	0.84
2. Standardize work flows	P_T2	3.73	0.51	0.76	
3. Be sensitive to subordinates' work needs	P_T3	3.47	0.47	0.82	
4. React effectively to subordinates' work situation	P_T4	3.49	0.51	0.64	
5. Give appropriate feedback to subordinate on work performance	P_T5	3.36	0.44	0.78	
Employee-oriented physician leadership					
Common factor 2: PHY_EMP					
6. Clearly express expectations and feelings to subordinates	P_E1	2.95	0.54	0.77	0.86
7. Encourage subordinates to be creative and active	P_E2	3.30	0.58	0.78	
8. Be considerate of subordinates' perceptions about what they care about	P_E3	3.24	0.63	0.88	
9. Consult subordinates for their opinions before making decisions	P_E4	3.26	0.64	0.81	
10. Be easygoing with and comprehensible to subordinates	P_E5	3.12	0.55	0.68	
ED nurse leadership: what ED nurse leader does					
Task-oriented nurse leadership					
Common factor 3: NUR_TASK					
11. Specify goals understandable by subordinates	N_T1	3.65	0.65	0.77	0.88
12. Standardize work flows	N_T2	3.81	0.67	0.75	
13. Be sensitive to subordinates' work needs	N_T3	3.57	0.75	0.82	
14. React effectively to subordinates' work situation	N_T4	3.61	0.67	0.79	
15. Give appropriate feedback to subordinates on work performance	N_T5	3.54	0.72	0.77	
Employee-oriented nurse leadership					
Common factor 4: NUR_EMP					
16. Clearly express expectations and feelings to subordinates	N_E1	3.15	0.75	0.78	0.86
17. Encourage subordinates to be creative and active	N_E2	3.43	0.76	0.82	
18. Be considerate of subordinates' perceptions about what they care about	N_E3	3.42	0.83	0.83	
19. Consult subordinates for their opinions before making decisions	N_E4	3.44	0.84	0.76	
20. Be easygoing with and comprehensible to subordinates	N_E5	3.13	0.73	0.67	
ED performance					
Common factor 5: UNIT_PERF					
21. Perform emergency care functions well	PER1	3.82	0.49	0.78	0.92
22. Capably achieve the goals of patient emergency service requirements	PER2	3.44	0.57	0.71	
23. Capably achieve the goals of emergency teaching/research	PER3	2.92	0.58	0.76	
24. Capably achieve a high quality of emergency patient care	PER4	3.43	0.53	0.87	
25. Capably meet the needs of emergency services for patients	PER5	3.10	0.64	0.85	
26. Capably meet the needs of emergency services for patient families	PER6	3.41	0.40	0.69	
27. Capably network with all ED team members	PER7	3.58	0.47	0.77	
28. React well when faced with emergency situations	PER8	3.55	0.48	0.87	
29. Meet the needs of patient and families well as compared to other hospital-based EDs	PER9	3.53	0.57	0.78	
ED employee work satisfaction					
30. Adjusted emergency physician satisfaction <sup>a</sup>	UNIT_PHY_SAT	73.46	3.81		
31. Adjusted emergency nurse satisfaction <sup>a</sup>	UNIT_NUR_SAT	72.94	2.59		

<sup>a</sup> Note: Adjusted for ED employees' gender, age, education level, employment relationship (coded as permanent or contracted), ED's full-time or part-time employment status, clinical and ED working years, and extent of busyness, using multiple regression methods.

information on the construction of all measurement models is shown in Fig. 2.

After the measurement models were validated, the structural equation model was performed to specify the causal relationships among ED leader behaviors (LEAD\_TASK and LEAD\_EMP), unit performance (UNIT\_PERF), and employee satisfaction (UNIT\_PHY\_SAT and UNIT\_NUR\_SAT), with ED unit characteristics and environmental factors as confounding variables. The analytical processes comprised model construction, parameter estimation of the model, test for the fit of the model, and model modification using the maximum likelihood estimation procedure (Bollen, 1989). Satisfactory model fit includes the following: 1) a non-significant chi-square test ( $p > 0.05$ ), 2) mean square error of approximation (RMSEA) values less than 0.08, 3) P\_CLOSE (close fit) values greater than 0.05, 4) Hoelter's critical  $N$  values greater than 200, and 5) NFI and CFI for model goodness-of-fit greater than 0.90 (AMOS 6.0 User's Guide). The statistical analyses were performed using SPSS 12.0 software for descriptive analyses, factor analyses, and reliability analyses. AMOS 6.0 software was used for the structural equation modeling.

## Results

This study examined the relationship of task-oriented and employee-oriented leader behaviors to organizational outcomes,

named as unit performance and employee satisfaction, in the studied hospital-based EDs, controlling for several ED unit characteristics and environmental factors. A total of 112 hospital-based EDs responded to the survey; most were owned, staffed and managed by hospital governance (93%); 78% were independently departmentalized ED units. Ninety percent were responsible for their regional emergency networks. District-hospital-based EDs had relatively lower response rates than did medical-center-based and regional-hospital-based EDs, as compared to the study population of hospital-based EDs ( $\chi^2 = 12.69$ ;  $p = 0.001$ ). More than half of the surveyed hospital-based EDs were in urban areas, with an average of one million people at the county/city level. There was no statistically significant difference in geographical distribution between the respondents (sample) and the study population of hospital-based EDs ( $\chi^2 = 8.84$ ;  $p = 0.12$ ). The other detailed ED unit characteristics and environmental factors are shown in Table 1.

### *Descriptive analyses of leader behaviors, unit performance, and employee satisfaction in hospital-based EDs*

The item-by-item examination of scores for physician and nurse leader behaviors in EDs revealed that the scores for ED leader behaviors on average were over 3.0, except for the scores on how physician leaders expressed their expectation and feelings to subordinates (mean = 2.95, item 6 in Table 2). In terms of ED unit

performance, teaching/research was the least achieved goal (mean = 2.92, item 23 in Table 2). Overall, the emergency physicians' and nurses' work satisfactions had similar scores of about 70, adjusted for personal and employment characteristics.

#### Measurement models of leader behaviors and unit performance in hospital-based EDs

For the measurement models, the second-order constructs of task- and employee-oriented leader behaviors were constructed separately, each carried by the indicators for both physician and nurse leaders. The measurement model of unit performance in hospital-based EDs used nine performance indicators. Fig. 2 shows that the factor loadings for all indicators in the measurement models are significant at the 0.05 level. The validated models were used to construct the causal model in the next analysis. All measurement models show a good fit for the criteria in this study.

#### Analysis of the causal model: role of leader behaviors in hospital-based EDs' unit performance and employee work satisfaction

After validating the measurement models, the structural equation model was performed. The correlation matrix for all the studied variables is shown in Table 3. Environmental characteristics were shown to be highly correlated, so to avoid multicollinearity, two variables: area medical dispersion (SQUAR) and ED location (LOC) were excluded in the final structural equation modeling. The results (see Table 3) reveal that task-oriented leader behavior was positively related to ED unit performance ( $\gamma = 0.58, p < 0.001$ ). Both task- ( $\gamma = 0.27, p < 0.05$ ) and employee- ( $\gamma = 0.30, p < 0.05$ ) oriented leader behaviors were positively related to ED nurse satisfaction. In addition, we found that emergency physicians in

medical centers had higher ED work satisfaction than did those in regional hospitals ( $\gamma = -0.33, p < 0.05$ ) or in district hospitals ( $\gamma = -0.49, p < 0.05$ ). Independently departmentalized ED divisions in hospitals tended to have both more employee-oriented leader behaviors ( $\gamma = 0.29, p < 0.05$ ) and higher emergency physicians' work satisfaction ( $\gamma = 0.21, p < 0.05$ ). The overall model of the causal effects shows moderate fit, with chi-square = 939.07 ( $p = 0.001$ ), mean square error of approximation (RMSEA) values 0.07, P\_CLOSE (close fit) values 0.002, Hoelter's critical  $N$  values 82, NFI value 0.72, and CFI value 0.88.

## Discussion

This study aimed to explore how leader behaviors relate to organizational performance and employee satisfaction, using hospital-based EDs as the study focus. We found that task-oriented leadership is positively related to ED unit performance. Both task- and employee-oriented leadership were found to be positively related to ED nurses' work satisfaction. Independently departmentalized ED divisions in hospitals tend to have more employee-oriented leadership and higher ED physicians' work satisfaction. In addition, emergency physicians in medical centers have higher ED work satisfaction than do those in regional hospitals and district hospitals.

The study found that task-oriented leader behavior is related to higher performance in hospital-based EDs. This finding is similar to that of an earlier leader-effectiveness meta-analysis concluded that task-oriented leadership is related to leader job performance and group-organization performance (Judge et al., 2004). Task-oriented leadership in this study was characterized as the degree to which a leader defines and organizes his (or her) role and the role of followers, is oriented to goal attainment and establishes well-defined patterns and channels of communication. That may help to

**Table 3**

Correlation matrix analysis and standardized parameter estimates of the structural equation model for the effect of leader behaviors on hospital-based ED outcomes.

	1	2	3	4	5	6	7	8	9
1. IND	1								
2. SERVICE	0.37***	1							
3. EMS	0.11	0.27***	1						
4. ACC	-0.35***	-0.69***	-0.23*	1					
5. POP	0.09	0.02	-0.22*	-0.05	1				
6. URBAN	0.09	0.07	-0.17	-0.05	0.70***	1			
7. DENS	-0.06	-0.15	0.08	0.18	-0.50***	-0.09	1		
8. SQUAR	0.15	0.15	-0.07	-0.21*	0.75***	0.49***	-0.70***	1	
9. LOC	-0.14	-0.16	0.06	0.19*	-0.62***	-0.47***	0.69***	-0.84***	1
Determinants		ED leader behaviors			ED outcomes				
		LEAD_TASK	LEAD_EMP		UNIT_PERF	UNIT_PHY_SAT		UNIT_NUR_SAT	
LEAD_TASK		–	–		0.58***	0.11		0.27*	
LEAD_EMP		–	–		-0.07	-0.14		0.30*	
Confounding variables									
ED characteristics									
IND		0.02	0.29*		0.18	0.21*		-0.10	
SERV		0.09	-0.03		-0.03	0.06		0.17	
EMS		0.12	0.14		0.06	0.12		0.06	
ACC1		-0.01	-0.24		-0.02	-0.34*		0.02	
ACC2		0.19	-0.07		-0.14	-0.49**		-0.12	
ED environment									
URBAN		0.29	0.04		0.09	-0.14		0.03	
DENS		0.12	0.23		-0.19	-0.10		0.20	
POP		-0.25	0.06		-0.12	0.08		0.06	
R <sup>2</sup>		0.13	0.18		0.40	0.23		0.24	
Overall fit testing: Chi = 939.07; df = 628; p = 0.001; NFI = 0.72; CFI = 0.88; RMSEA = 0.07; PCLOSE = 0.002; HOTLER = 82									

Notes: 1. Variable labels are shown in Fig. 1.

2. ACC1: medical centers (default) vs. regional hospitals; ACC2: medical centers (default) vs. district hospitals.

3. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

explain the significant relationship between task-oriented leadership and ED effectiveness, since the effectiveness measures in this study were outcome-oriented: how EDs achieve their goals, meet patient/family needs and provide high quality care, lead ED teamwork, and react to ED situations; and the measures used peer comparisons. These explicit and practical indicators of task-oriented leader behavior could yield suggestions for how ED leaders re-focus their leadership skills and behaviors to become more task-oriented and thus improve their unit performance (Kaiser, Hogan, & Craig, 2008).

This study found that both task- and employee-oriented leader behaviors are positively related to the emergency nurses' work satisfaction. A previous study compared high-performing and low-performing nursing homes in order to identify critical points about successful leadership (Forbes-Thompson, Leiker, & Bleich, 2007). It revealed that the best leader behavior includes congruence with an organization's stated and actuated mission, connectivity among staff, ample information flow, and use of cognitive diversity, which are similar to the characteristics of task-oriented leadership explored in this study. In previous studies, mentoring has been urged as a way to provide professional growth benefits, appeal to employees and increase their enjoyment and satisfaction (Funderburk, 2008) and leaders' relational behaviors have been positively related to bonding social capital and in turn to vigor (Carmeli et al., 2009). We might infer that task- and employee-oriented leader behaviors may enhance instrumental communication, autonomy, and group cohesion simultaneously, to convey work expectations and considerations so as to improve the emergency nurses' perceptions about their work (Boyle, Bott, Hansen, Woods, & Taunton, 1999).

However, this study found neither task- nor employee-oriented leader behaviors to be related to the ED physicians' work satisfaction. One might argue that possible random variations in ED physician responses could make it harder to find a statistically meaningful relationship. Since some research has shown that satisfaction factors differ between emergency physicians and nurses (Lin et al., 2008), we might also argue that emergency physicians, with more credentials and the privileges of their medical skills and profession, or their strong personalities (Vidrine, 2004) may have driven the ED leadership into "covert leadership" (Mintzberg, 1998), which may have led to significant challenges for supervisors. Or it may be that the emergency physicians expect certain specified leader behaviors such as solving problems not only in their departments but across departmental/organizational boundaries for emergency patients' referrals. Perhaps other leadership skills proved in other industries: self-awareness, shared authority, conflict resolution, and non-punitive critiques might be options (Prather & Jones, 2003). Further studies of the influence of leadership on physician work outcomes are called for.

On the other hand, we found that both EDs' departmentalization in hospitals and their membership to medical centers are associated with higher satisfaction of emergency physicians. That may be due to greater professional autonomy and achievement of expertise in the EDs of independent departments and medical centers. Further studies could explore how the characteristics of organizational design may influence ED physicians' working attitudes and behaviors. That is a research issue of interest for building knowledge about leader behaviors for ED management. It also would be worthwhile to focus on understanding the mechanisms of ED medical professionals' work lives, including their work satisfaction.

In addition, this study found that EDs as independent departments in hospitals have leader behaviors that tend to be employee-oriented. One possible explanation is that with the independent departmentalization of EDs there is more specification, autonomy, and independence for the staff, which may encourage leaders to be

more person-oriented for employee support instead of task-oriented for direction of employees' work (Lucas, 1986).

Several limitations of the study can be pointed out. First, the study recruited individual hospital-based EDs for the sample. We had a lower percentage of participation by district hospitals than by medical centers or regional hospitals. Therefore, the study generalizability may be limited to district-hospital-based EDs. Also, the study findings could be generalized only to hospital-based EDs, but not freestanding ED units. Moreover, the focus is only on the items specified for task- and employee-oriented ED leader behaviors and their relationship with ED outcomes. There remains room for exploring leadership in hospital-based EDs from other perspectives such as leadership characteristics (trait theories) and working status (situation perspectives) (Ivancevich & Matteson, 2002). Despite the limitations, this study may enrich the understanding of leader behaviors in the operation of high-velocity environments such as EDs.

The study dealt with the constructs of two leadership behaviors: task-oriented and employee-oriented by combining the responses of physician and nurse leaders with the same weights. One should note that these two types of leaders (physicians and nurses) may not exercise leadership equally in EDs and moreover may have conflicting styles. Such differences could foster dissent among employees as conflicts arise among the leaders. Since we did not have sufficient data in this study to adjust for the likelihood of the two types of leaders (physicians and nurses) contributing leadership unequally in the EDs, these points deserve further study. In this study, we also examined individual effects of styles of physician and nurse leadership; however, no individual effects of leadership on ED outcomes were found (data not shown). Therefore, we viewed the leadership in terms of behavior as a whole, no matter whether physician or nurse leaders exhibited it. The findings offer some clues about the synthesized values of leadership (physician and nurses) in ED teamwork as seen in this study. The implications of dual leadership are well worth researchers' attention.

Moreover, ED objective performance indicators could be examined further, as replacements for the subjective performance indicators in this study. Subjective measures of ED performance (i.e. employee ratings) were used because of the difficulty of accessing objective performance data such as efficiency of utilization, adjusted patient outcomes, adherence to medical guidelines, patient-reported satisfaction (Shortell et al., 1994), which are among those that are expected to deepen understanding of ED performance in the future. Moreover, to broaden the theoretical and practical bases of understanding ED performance, organizational process and dynamics other than leader behaviors might be studied to enhance the management of hospital-based EDs.

The lack of longitudinal data in this study is a limitation of the analytical design. The cross-sectional study can establish only relationships among the constructs or variables, not causal relationships. The establishment of causal relationship must rely on a dynamic model that examines the changes over time. This study has established a framework with pertinent and validated constructs that will enable the conduct of longitudinal studies if a panel study set is available in the future.

In conclusion, our study filled a gap of limited studies about the influence of leadership behaviors on hospital-based EDs' outcomes: unit performance and employee satisfaction. Our findings might offer ED managers (leaders) behavioral guides to drive better performance and create work environments for followers, from leadership perspectives. In terms of methodology, this study used multiple indicator modeling to validate the measurement model's goodness of fit for the underlying constructs of ED leadership and unit performance, to more broadly portrait the relevant facets. Our findings revealed that task-oriented ED leader behavior is



positively related to ED unit performance. Both task- and employee-oriented ED leader behaviors were found to be positively related to ED nurses' work satisfaction. However, ED leader behaviors were not shown to be related to ED physicians' work satisfaction at a statistically significant level. Efforts could be made for further studies of leadership on physician work outcomes. We suggest that leaders can be educated for managing themselves, managing organizations, managing contexts, managing relationships, and managing changes (Gosling & Mintzberg, 2003). Also, managers have to appreciate the key principles of motivation and learn what their legitimate role is in the fulfillment of employee needs (McConnell, 2005).

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### Appendix. Supplementary material

Supplementary data related to this article can be found online, at doi:10.1016/j.socscimed.2010.10.030.

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