

Management Information Systems, Transformational Leadership, and Work Discipline Influenced the Work Effectiveness among Nurses: A Cross-sectional Study

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Abstract

Objective: The study aimed to determine the association between information management system, transformational leadership on working effectiveness with work discipline as intervening variables. **Method:** A cross-sectional study with a survey approach was conducted in this study. The data analysis was conducted using the path analysis. One hundred thirty-one samples were recruited in this study. **Result:** The results of this research show that the Management Information System has a significant effect on work effectiveness. Transformational leadership has a significant effect on work effectiveness. Management Information Systems have a significant effect on work discipline. Transformational leadership has a significant effect on work discipline. Work discipline has a significant effect on work effectiveness. Work discipline plays a significant role as an intervening agent between the Management Information System and work effectiveness or it could be said that the Management Information System has a significant effect on work effectiveness with work discipline as an intervening variable. **Conclusion:** Work discipline plays a significant role as an intervening agent between transformational leadership and work effectiveness or it can be said that transformational leadership has a significant effect on work effectiveness with work discipline as an intervening variable. **Recommendation:** The management level in the hospital need to consider the effective management information system and work discipline to improve working effectiveness. The transformation leadership was effective to increase motivation among employee so that the organization need to consider. Further study may develop the R&D study to develop the program focused on the working effectiveness and working efficiency to improve the level of hospital

Keywords: management information systems, transformational leadership, work effectiveness, work discipline.

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INTRODUCTION

Hospitals have the duty to provide the best possible treatment, care and health services to the community. Improving the quality of hospital services cannot be separated from the role of all staff and elements in the hospital (1).

The interplay between Management Information Systems (MIS), transformational leadership, and work discipline significantly influences work effectiveness. Management Information Systems (MIS) are integral to modern organizations, providing a structured approach to the collection, processing, storage, and dissemination of information. MIS supports decision-making processes, coordination, control, analysis, and visualization of information in organizations (2).

To achieve goals by institutions operating in the health sector, hospital management not only faces problems regarding raw materials or equipment but also rates or costs and the leadership they have (3).

In order for the Management Information System to run well, doctors must have managerial competence in managing resources that affect work effectiveness and work discipline. Leaders need to have the right strategy to empower nursing staff through collaboration, providing opportunities to improve their profession, organizational culture and being involved in various activities that support programs in the hospital (4). A study mentioned that management information systems have a positive and significant effect on the Work Effectiveness variable (5).

Second issue related to the transformational leadership. Transformational leadership is a style that inspires and motivates employees to innovate and create change necessary for organizational success (6). This leadership approach is characterized by the ability to identify business processes that need improvement and to encourage employees to develop new solutions (7).

The effectiveness of transformational leadership lies in its ability to align the interests of the employees with the goals of the organization, thereby enhancing commitment, loyalty, and performance (8).

Another factor associated with the work effectiveness such as working disciplines. Work discipline refers to the adherence to policies,

procedures, and standards within an organization. It is a critical aspect of organizational behavior that ensures the smooth functioning of business operations (9).

Effective work discipline is associated with increased productivity, employee satisfaction, and long-term organizational success (10). Modern practices of employee discipline involve a progressive approach to managing infractions, with a focus on developing a dedicated and self-disciplined workforce.

A study stated that Work discipline is a way for managers to communicate with their employees so that they are willing to change their behaviour and increase their awareness and willingness to comply with company regulations and social standards (10).

Together Management Information Systems (MIS), transformational leadership, and work discipline create a framework within which employees can excel, driving the overall effectiveness and success of the organization.

Although some studies had been done related to this issue, few study explore this factors directly and indirectly with working effectiveness.

Cross-sectional studies examining the relationship between these factors and work effectiveness would likely explore how the integration of technology, leadership style, and disciplinary practices impact employee performance, job satisfaction, and organizational outcomes. Such studies could provide insights into the best practices for leveraging MIS, cultivating transformational leadership, and maintaining work discipline to enhance work effectiveness. Therefore, this study would focus on the associated between MIS, transformational leadership, and work discipline with work effectiveness.

OBJECTIVE

The study aimed to determine the association between information management system, transformational leadership on working effectiveness with work discipline as intervening variables

METHODS

Design

This study was conducted using the cross-sectional study with survey approach to

determine the association between information management system, transformational leadership on working effectiveness with work discipline as intervening variables

Sample size and sampling technique

This study was conducted at Kartika Cibadak hospital, Sukabumi within two months data collection. This research selected 131 permanent medical and non-medical employees who had worked at Kartika Cibadak Sukabumi Hospital for at least 3 years (including the contract period). Sample calculations use the Slovin technique. The Slovin technique is used because the sample size must be representative so that the research results can be generalized

The instrument for data collection

All the data from this study were gathered using the structure questionnaire. The process of data collection was conducted within two months. Prior the data collection, all respondents received the information from researchers regarding the objective of study and process of study should be done. The informed consent was provided to all respondents by signing the informed consent letter. The instruments had been validated by expert and tested for reliability. The details of instruments would be explained as follows:

Management Information Systems (MIS) was measured using the questionnaire focused on management information system. This instrument consisted of 4 indicators such as 1) system quality, 2) quality of information used, 3) system information management use, and 4) user satisfaction. The total item questionnaire was 8 questions with Likert scale measures such as 1=strongly disagree, 2=disagree, 3=moderate, 4=strongly agree, and 5=strongly agree. The total score of this instrument was 40. The highest score showed the good management information system and the lowest score was bad management system of this hospital.

Transformational leadership was measured using the structure questionnaire which is focused on how the transformational leadership influenced the working effectiveness. This instrument consisted of 4 indicators such as 1) idealized influence, 2) inspirational motivation, 3) intellectual

simulation, and 4) individualized consideration. The total item questionnaire was 9 questions with Likert scale measures such as 1=strongly disagree, 2=disagree, 3=moderate, 4=strongly agree, and 5=strongly agree. The total score of this instrument was 45. The highest score showed the good transformational leadership and the lowest score was bad transformational leadership.

Working discipline was measured using the structure questionnaire which is focused on working discipline among nurses. This instrument consisted of 4 indicators such as 1) idealized influence, 2) inspirational motivation, 3) intellectual simulation, and 4) individualized consideration. The total item questionnaire was 8 questions with Likert scale measures such as 1=strongly disagree, 2=disagree, 3=moderate, 4=strongly agree, and 5=strongly agree. The total score of this instrument was 40. The highest score showed the good working discipline and the lowest score was bad working discipline.

Working effectiveness was measured using the questionnaire which focused on working effectiveness. This instrument consisted of 3 indicators including 1) goal achievement, 2) integration, and 3) adaptation. The total item questionnaire was 6 questions with Likert scale measures such as 1=strongly disagree, 2=disagree, 3=moderate, 4=strongly agree, and 5=strongly agree. The total score of this instrument was 30. The highest score showed the effective of working and the lowest score was not the effective of working.

The validity of those questionnaires was tested using the correlation testing between score each question item with the total value of the questionnaire. If $r_{count} > r_{table}$, then the test item is declared valid. The result found that all score of $r > r_{table}$ (0.172). Thereby, all item questionnaire was valid.

The reliability scores of the instrument this questionnaire including 1) Management Information Systems (MIS) questionnaire (Cronbach alpha=.935), transformational leadership questionnaire (Cronbach alpha=.935), work discipline (Cronbach alpha=.935), and work effectiveness questionnaire (Cronbach alpha=.951). Thereby, all instruments were reliable.

Data analysis

The descriptive analysis was used to describe the characteristic of respondents. The three-box method was used to describe the question items. The scoring technique used in this research is with a maximum score of 5 and a minimum of 1. The technique used in this study uses a structural equation modelling (SEM) approach.

This analysis technique is suitable when used for relationship analysis needs that describe a series of stages or processes through path analysis. The goodness to fit test aims to measure the coefficient of determination (R²) as a prediction of 'closeness' between the dependent and independent variables

Ethical consideration

This study had been approved by IRB Universitas Esa Unggul Jakarta.

RESULTS

Characteristic of respondents

Table 1 described the characteristic of respondents most of respondents are women (67.9%). Most of respondents are 26-35 year (78.6%). Some of them graduated from diploma of IV from nursing department (38%), following by diploma of III (30.5%) and bachelor of nursing (35.9%). Regarding the duration of working, most of them have been working within 3 to 6 years (71.8%)

Table 1. characteristic of respondents

No	Characteristic	
	Gender	
	Men	32.1
	Women	67.9
	Age	
	17-25 years	11.5
	26-35 years	78.6
	36-55 years	9.9
	Education level	
	High school	
	Diploma of III	27.5
	Diploma of IV	30.5
	Bachelor	3.8
	Master	35.9
		2.3
	Working duration	
	>10 year	
	6-10 year	3.8
	3-6 year	24.4
		71.8
	Unit of working	
	Finance and	

accounting	18	13.7
Committee and		
management	9	6.9
Medical ward	64	48.9
Medical support	17	13
General and		
personnel	23	17.6

Goodness of fit model

Table 2 described the goodness of fit model. The result found that 7 indicators are Good Fit. Therefore, the overall model is fit and no need to modify the model

Table 2 Goodness of fit model

Goodness of Fit	Cut off value	Result
χ^2 Chi Square	To test whether empirical data absolute fit the hypothetical model or not p-value of CMIN $\chi^2 >$	806.239
Significance Probability	≥ 0.05	0,000
Relative Chi-square (CMIN χ^2/df)	≤ 2.00	1.884
GFI	≥ 0.90	0.723
AGFI	≥ 0.90	0.679
CFI	≥ 0.90	0.899
TLI	≥ 0.90	0.890
NFI	≥ 0.90	0.808
IFI	≥ 0.90	0.900
RMSEA	≤ 0.08	0.082
RMR	≤ 0.05	0.030

Coefficient of determinant (R²)

Determinant coefficient analysis to determine the magnitude of the influence of the independent and intervening variables on the dependent variable. The greater the value of the determinant coefficient, the greater the influence it will have on the dependent variable

Table 3 shows the determinant coefficient value for the Work Discipline variable of 0.515. Thus, the Management Information System and Transformational Leadership variables have an influence of 51.5% on Work Discipline. Meanwhile, the Work Effectiveness variable obtained a value of 0.767,

which means that the Management Information System and Transformational Leadership variables have an influence of 76.7% on the Work Effectiveness variable with the Work Discipline variable as an intervening variable

Table 3. Coefficient of determinant (R²)

Variable	Estimate
Working discipline	.515
Effectiveness of working	.767

Association between the independent variables with dependent variable

Table 4 showed the association between the independent variables with dependent variable. The results found that there are positive association between working discipline with management information (p-value < .05); working discipline with transformational leadership (p-value < .05); effectiveness of working with management information (p-value < .05); effectiveness of working with working discipline (p-value < .05); effectiveness of working with transformational leadership (p-value < .05)

Table 3. Association between the independent variables with dependent variable

Association between variables	Estimate	p-value
Association between working discipline with management information	.494	.000
Association between working discipline with transformational leadership	.575	.000
Association between effectiveness of working with management information	.237	.020
Association between effectiveness of working with working discipline	.598	.000
Association between effectiveness of working with transformational leadership	.211	.031

Testing for intervening variables

The results of the analysis show that the value of direct effects and indirect effects of the Management Information System on Work Effectiveness is 0.185. Thus, this value is smaller than the influence of the Management Information System on Work Effectiveness through Work Discipline (indirect effect) which is 0.213. It was concluded that Work Discipline plays a significant role as an intervening agent between the Management Information System and Work Effectiveness or it could be said that the Management Information System has a significant effect on Work Effectiveness with Work Discipline as an intervening variable.

In the table the direct effect of Transformational Leadership on Work Effectiveness is 0.155. This value is smaller than the influence of Transformational Leadership on Work Effectiveness through Work Discipline (indirect effect) which is 0.296. It was concluded that Work Discipline plays a significant role as an intervening factor between Transformational Leadership and Work Effectiveness or it can be said that Transformational Leadership has a significant effect on Work Effectiveness with Work Discipline as an intervening variable.

Table 5. Standardized direct effects

	Transformational Leadership	Management information system
Working disciplines	.467	.335
Working effectiveness	.155	.185

Table 6. Standardized indirect effects

	Transformational Leadership	Management information system
Working disciplines	.000	.000
Working effectiveness	.296	.213

DISCUSSION

Management Information Systems have a significant influence on work effectiveness. Management Information Systems are very important in supporting the effectiveness of the

organization's work both as a whole and the work effectiveness of individual employees. Management Information Systems function to carry out information delivery activities in a timely, accurate manner and to produce products that can help achieve goals and make decisions within an organization. The results of this research are in line with previous research which states that Management Information Systems have a positive and significant effect on work effectiveness (12-13).

Management Information Systems (MIS) have a significant influence on work effectiveness by providing managers with accurate, timely, and relevant information to make better decisions. MIS allows managers to track and manage resources such as people, equipment, materials, and finances, improving efficiency and reducing costs. It also enables collaboration between teams, automates tasks, and reduces errors. By providing real-time data, MIS helps managers plan ahead and make better decisions. It is an integral part of any business, regardless of its nature or size, and is used to analyse and facilitate strategic and operational activities (13-14).

Transformational leadership has a significant effect on work effectiveness. According to research, transformational leadership is positively related to various performance outcomes, including emotional intelligence, task performance, organizational citizenship behaviours, organizational commitment, occupational safety, team performance, and team innovation (15).

Transformational leaders inspire employees to strive beyond expected performance levels, encouraging them to work towards a shared vision. It was consistent with a previous study mentioned that Strategic leadership creates a unique relationship between management and employees to increase work effectiveness (16). Supportive leadership has a positive and significant effect on work effectiveness and transformational leadership behaviour has a positive and significant effect on work effectiveness. The better the transformational leadership, the higher the work effectiveness (17). In research by Macey & Schneider, (2008) that leadership is one of the factors that can be used as a benchmark for a person's work effectiveness, the influence of leadership on work

effectiveness has a significant influence (18). However, it is essential to note that transformational leadership can have both positive and negative effects, and the optimal degree of transformational leadership practice may vary depending on the context (15).

Employee work discipline is also an important factor that must not only be considered but also actually implemented. Good employee work discipline will achieve high quality and work performance. In this way, the company or related agency will obtain optimal results from the resources produced. The steps in achieving work discipline are by utilizing the Management Information System. The main goal is so that companies or agencies are able to adapt to changes that occur and are able to operate effectively and efficiently. The results of this research are in line with research conducted by Sitopu et al., (2021) showing that Management Information Systems have a positive and significant effect on work discipline (19).

The estimated coefficient of 0.598 indicates that the influence provided is positive. Therefore, the better the work discipline, the higher the work effectiveness. Regulations are very necessary to provide guidance and counselling for employees in creating good organizational regulations. With good rules and regulations, employee enthusiasm, work enthusiasm, efficiency and effectiveness will increase. This will support the achievement of organizational, employee and community goals. It is difficult for an organization to achieve its goals if employees do not comply with these regulations. The discipline of an organization is said to be good if the majority of its employees obey existing regulations (20). This research is in line with the results of research conducted by Nelson et al., (21) explaining that there is an influence of work effectiveness on work discipline

In this study also described the role of working disciplines as an intervening agent between transformational leadership and work effectiveness, or it could be said that transformational leadership has a significant effect on work effectiveness with work discipline as an intervening variable. According to Mayer et al., (22) work effectiveness is the quality and quantity of work results produced by employees in carrying out their duties in

accordance with the responsibilities given to them. Performance is not a result that can be measured when the work has been completed, but is the result of an evaluation of previous work over a certain period of time. Based on Gibson & Mitchell, (23), states that the factors that influence work effectiveness are individual variables, psychological variables, and organizational variables, including: individual variables, namely ability, physical and mental skills, and background. Psychological variables such as perception, attitude, personality, learning and motivation. Organizational variables include resources, leadership, rewards, structure, job design, and work discipline

Implication

Some implications have been encountered for this study such as:

- 1) Transformational leadership plays a crucial role in enhancing employee performance and work effectiveness. Leaders who inspire and motivate their teams can foster an environment conducive to high productivity and engagement. Studies have shown that transformational leadership positively influences employee performance through improved motivation and discipline.
- 2) The integration of Management Information Systems can significantly streamline operations and improve communication within organizations. By providing timely access to information, MIS supports decision-making processes that enhance both leadership effectiveness and employee discipline, ultimately leading to improved work outcomes

Conclusion

In conclusion, the study found that transformational leadership, MIS, work discipline, work motivation, organizational commitment, and job satisfaction were all interconnected factors that influenced the work effectiveness of employees. By focusing on these factors, organizations can create a positive work environment that encourages innovation, productivity, and employee engagement, leading to better organizational outcomes

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