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The Model of Type-2 Diabetes Mellitus Prevention based on SECI-Knowledge Management

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Abstract

Diabetes mellitus (DM) patients need a new approach of primary, secondary or tertiary prevention. This research aimed to develop the module of DM-prevention based on SECI-Knowledge Management in public health center, used a exploration and experiment studies. The sample was 96 type-2 DM patients selected by simple random sampling. The variables were primary prevention behavior, Random Blood Glucose (RBG) and DM-Prevention model based on SECI-knowledge management. The data were collected by using questionnaire and RBG examination, then analyzed by PLS. The results showed that there was significant influence after applied DM-prevention model based on SECI-knowledge management in enhancing the capabilities of patients in primary prevention.

Keywords: type-2 DM, SECI-knowledge management, primary prevention

Introduction

An increase of DM-patients need a new approaches of primary, secondary or tertiary prevention. Prevention approach not only affect prevention before the patient is exposed to DM, but also secondary prevention i.e. the principle of the prevention of an increase in blood sugar levels and tertiary prevention i.e. prevention of expansion of impact or complications.

The process of behavior change starts from the process of knowledge transfer from both the health worker cadres, as well as other sources of information about how to route the prevention. The process of knowledge transfer/knowledge management is very necessary so that knowledge dissemination is the first step in the process of behavior change.

Knowledge management is a process of regulating the knowledge of each individual, so that it is structured and easy to access and transfer to other people. According to Seubert et al.[1], knowledge management

is a discipline that introduces an integrated approach in identifying, capturing, evaluating, providing, and sharing information for the benefit of companies/ institutions/organizations.

This research aimed to develop module of DM-prevention based on SECI-Knowledge Management in public health center, used a exploration and experiment studies.

Method

The design of this study were cross sectional and pre-experiment (one group pretest-posttest design). The population were the holders of DM program and health cadres in the district in 2017. The sample size was 100, selected by cluster sampling. Data were obtained from 96 respondents through fillout the questionnaires. The independent variables were personal factors, organizational factors, technical factors and peer trustworthness factors. The moderator variable was SECI-Knowledge Management and the dependent variable was DM-prevention. Data were analyzed by Partial Least Square (PLS).

Findings

Table 1 shows the results of convergent validity test. All of outer loading were >0.5 (valid).

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Table 1. Test results of convergent validity test

No	Variable	Indicator	Outer Loading	Information
1	Personal			
	1. Fun Sharing Knowledge	X11	0.901	Valid
	2. Self Efficacy	X12	0.907	Valid
2	Organizational			
	1. Leadership Support	X21	0.995	Valid
	2. Award from Puskesmas	X22	0.690	Valid
3	Technical	X3	1.00	Valid
4	Peer Trust	X4	1.00	Valid
5	SECI-Knowledge Management			
	1. Healthy Diet	Y11	0.799	Valid
	2. Physical Activity	Y12	0.776	Valid
	3. Safe and Organized Medicine	Y13	0.610	Valid
	4. Monitoring of RBG	Y14	0.678	Valid
	5. Utilizing Health Facilities	Y15	0.828	Valid
6	DM-prevention			
	Primary	Y21	0.866	Valid
	Secondary	Y22	0.894	Valid
	Tertiary	Y23	0.885	Valid

The results of reliability tests are shown in table 2. The cut off value of composite reliability was >0.7 and Cronbach-Alpha was >0.6.

Table 2. The results of reliability test

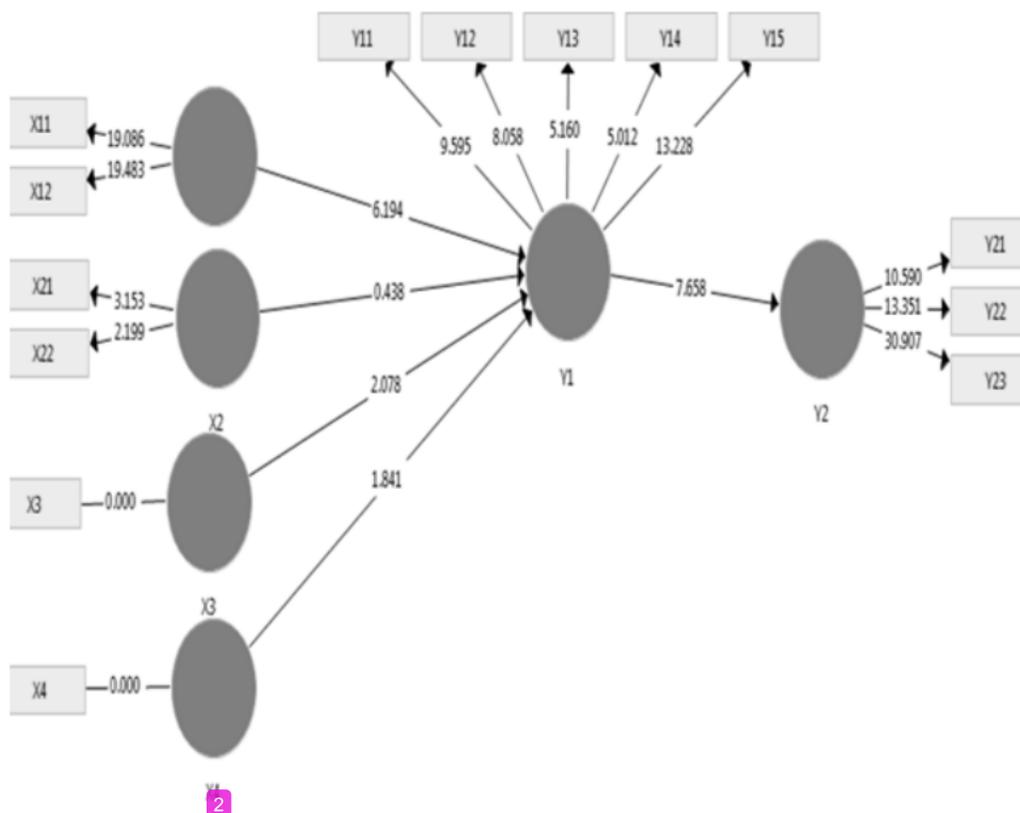| No	Variable	Composite Reliability	Cronbach Alpha	Information
1	Personal	0.899	0.776	Reliable
2	Organizational	0.842	0.862	Reliable
3	Technical	1.000	1.000	Reliable
4	Peer Trust	1.000	1.000	Reliable
5	SECI-Knowledge Management	0.857	0.790	Reliable
6	DM-Prevention	0.913	0.858	Reliable

Figure 1. The model of Type-2 DM prevention based on SECI-Knowledge Management

Figure 1 shows the structural model based on the validity and reliability test. The hypothesis testing results are shown in Table 3.

Table 3. The hypothesis testing results

No	Path	Path-coefficients	SE	T	Information
1	Personal factors → SECI-knowledge management	0.674	0.105	6.194	S
2	Organizational factors → SECI-knowledge management	0.016	0.050	0.438	NS
3	Technical factor → SECI-knowledge management	0.224	0.103	2.078	S
4	Peer trust → SECI-knowledge management	0.101	0.056	1.841	NS
5	SECI-knowledge management → DM-prevention	0.653	0.084	7.668	S

S=Significant; NS=Not Significant

Table 4 shows the results of the evaluation of preventive behavior after implementation of health promotion by the program holders.

Table 4. The results of preventive behavior evaluation

No	Assessment	Frequency	Percentage	Difference-test
1	Primary Prevention			
	Pretest			
	-Less	64	66.7%	t-test =-19.520
	-Enough	23	24%	df=95
	-Good	9	9.4%	p-value=0.000
	Posttest			
	-Less	2	2%	
	-Enough	6	6%	
	-Good	88	92%	
2	Random Blood Sugar			
	Pre-Test			
	-Minimum	200	-	t-test=41.132
	-Maximum	552	-	df=95
	-Mean	238	-	p-value=0.000
	Post-Test			
	-Minimum	150	-	
	-Maximum	514	-	
	-Mean	199	-	

The results of the evaluation of the application modules created gives good results (Table 4).

Discussion

The Role of Personal Factors

There was effect of personal factors on SECI-knowledge management. The pleasure of sharing knowledge is the feeling of someone who loves to explore new knowledge. Wasko & Faraj (2005)[2]; Lin & Lee (2006)[3] states that the pleasure of sharing knowledge from members of an organization or community in gaining wealth intelectual, they like to engage and delight in solving problems so that it will get the experience that they love to tell or share that knowledge to others. The pleasure of sharing knowledge will greatly affect the behavior of health care personnel in improving the knowledge itself and pass it on to others. This factor needs to be improved because in the health workforce with motivated to learn and knowledge dissemination efforts affect a good to a friend or colleague to patients as a form of outreach/health promotion efforts.

Other personal factors is self efficacy. Self-efficacy according to Bandura (1997)[4] is the perception of a person on his ability to organize and carry out the task. According to Endres et al. (2007)[5] is an individual assessment against the ability he has and give a sense of how someone made the decision to share knowledge. They believe that individuals with knowledge of the higher self efficacy are more willing to share their knowledge and experiences of their past than individuals with knowledge of self efficacy is low. Individuals with knowledge of high self efficacy rated positively on the ability and their accomplishments that will motivate them to share knowledge. High self confidence will be the ability of self will encourage health workers to conduct the SECI-knowledge management.

In general, the level of sharing pleasure and self efficacy were in less categories. The reluctance of a person in sharing knowledge will lead to a level of ability every health worker will tend to be static and a desire to do outreach/health promotion to the community will decrease and become routine work. The cause of the less level of pleasure in sharing knowledge could be caused by low self efficacy and lack of training especially

prevention of DM in the last year.

The Role of Organizational Factors

The results showed that there was effect of organizational factors on SECI-knowledge management. Organizational support will affect the performance of the employees. According to Lin & Lee (2006)[3], positive view of lead in trying hard to introduce knowledge sharing activities among employees is an indispensable factor to foster a culture of knowledge sharing. Provide the facilities required officers to support their knowledge-sharing is a form of policy in favor of the employees. While according to Tobing (2007)[6], awards or rewards is a stimulant to grow passion sharing. The award can be either an explicit reward, such as direct awards which are financial or non-financial. Rewards also may be implicit that became a driving force even become prerequisite for the sharing of knowledge.

Organizational factor is a factor that affects the management of SECI and knowledge sharing but the results of this study indicate that organizational support did not significantly affect the SECI-knowledge management. This may be caused by individual factors that have been discussed before.

The Role of Technical Factors

The results showed that there was effect of technical factors on SECI-knowledge management. Technical factors in general health care personnel in the category of low/lacking. Lack of these factors needs to get attention. The low ability of technical health personnel will cause the ability level of each health workers will tend to be static and a desire to do outreach/health promotion to the community will decrease and become routine work. This may be due to lack of computer facilities, communication as well as containers of low ability to operate a computer and the internet create new knowledge only obtainable from the training undertaken by health workers and compounded with the the lack of dissemination of the results of the training or seminar that was attended by medical personnel make the knowledge gained is only understood by the participants of the training course..

The Role of Trust

The results showed that there was effect of organizational factors on SECI-knowledge management. The trust factor is generally in the low category. Low

peer trust will lead to reluctance of health workers to do a good knowledge management. This will make the ability of each health workers will tend to be static. The model of Al-Busaidi et al. (2010)[7] involves five variables that are thought to affect knowledge sharing and further affect the individual benefits. The variable is a system quality, service quality, management support, rewards policy, trustworthiness, and peers.

The results of this study showed that rewards policy, management support, and system quality affects knowledge sharing.

The Role of SECI-Konowledge Management

The results showed that there was effect of SECI-knowledge management on prevention behavior. The model based on SECI-knowledge management significantly affect the ability of health workers in delivering information and knowledge about the prevention of disease to the patient. Improved skills based on SECI-knowledge management consists of 4 stages namely socialization, externalization, combination, and internalization. Stages is a way or a tool for organization to build a knowledge, where knowledge that later will be used by the organization to develop him[8].

Education can increase knowledge through formal and informal education such as training, seminars and so on. Sources of knowledge can be a community leaders both formal and informal expert on religion, the holder of the government, and so on.[9]

Knowledge developed here is about a preventative DM. Each stage takes time to produce knowledge that can be directly applied by its members. Internalizaton stages are stages in which new knowledge will be automatically applied by members without needing to be reminded or supervised, which means this knowledge has become a cornerstone of the individual in performing the act or behave. Behavior based on knowledge then it is more lasting than the behavior not based on knowledge[10]. It is strongly influenced by the intensity of attention and perception towards objects[11]. Factors affecting knowledge including age, education, occupation, interests, experience, culture and information[12].

Increased knowledge will have an impact on the patient's behavior changes. This research shows that there is a change of behavior after health education using

module of SECI. According to Green cit. Notoatmodjo (2007)[11], that there are three factors that affect individual behavior change i.e. predisposing factor which includes (knowledge, attitudes, beliefs, social norms, and another elements); enabling factor (age, social status, education, and human resources); and reinforcing factor (attitude of her husband, parents, community leaders or health worker and health cadres).

Conclusion

There was significant influence after applied DM-prevention model based on SECI-knowledge management in enhancing the capabilities of patients in primary prevention.

Additional Informations

Conflict of Interest: No

Source of Funding: Authors

Ethical Clearance: Yes

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