Analysis of the Mediating Effect of Self-Efficacy on Self-Regulation Fatigue and Self-Management Behavior in T2DM Patients

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Abstract

Objective: To enhance and control the illness of type 2 diabetes sick person, to travel around the intervene job of diabetes patients. ***Methods:*** 238 patients with type 2 diabetes recruited online from 2021 to 2022 were surveyed on general information. Linear regression and arbitration belongings examine were performed on the specimen. ***Results:*** The results of multiple linear regression indicate that the age, living alone, self-management behavior, and self-regulation fatigue significantly affected the self-efficacy of patients with type 2 diabetes ($p < 0.05$). Self-efficacy mediating model, the total mediation was -0.375 people, with a mediation ratio of 41.8%. The mediating effect was significant ($P < 0.05$). ***Conclusion:*** The self-efficacy of patients with type 2 diabetes is associated with age, living alone and self-management behavior and self-regulation fatigue ($P < 0.05$), and self-efficacy can significantly building and improve self-regulation fatigue, the mediating effect was important ($P < 0.05$). Therefore, it is recommended that hospital staff and patients be aware of the influencing factors that affect patients' self-efficacy, and the relationship between self-efficacy, self-regulatory fatigue, and self-management behavior.so as to reasonably enhance the self-efficacy and self-management behavior of diabetic sick person.

Keywords: type 2 diabetes, self-efficacy, mediation effect

1. Introduction

Diabetes is still angry around the earth, according to the significant data, of which the commonness of kind 2 diabetes reached 90%, cause enormous economic and possessions mislaying (Sun H, Saeedi P, Karuranga S, Pinkepank M, Ogurtsova K, Duncan BB, et al., 2021; Aina Modupe A & Agbede Catherine O., 2021). Studies (Funnell, M. M., Brown, et al., 2009) have indicated that excellent lifestyle and mannerism can virtually control diabetes, so sick person play a vital job in diabetes control and administration. According to Bandura's self-efficacy hypothesis (Bandura, A., 1997), the association between self-efficacy and behavioral position is optimistic. Therefore, the lofty the patient's self-efficacy, the more efficient the self-management behavior. In addition, in the care of diabetes it is usually anticipated that sick person will be able to control their diabetes throughout the course of the illness, and self-management behaviors amuse yourself an optimistic role in the control of the patient's disease (Mohebi, S., Azadbakht, L., Feizi, A., Sharifirad, G., & Kargar, M., 2013). Therefore, to study and explore the mediating role of diabetic patients. At the same time, it also provides reference for improving and controlling diabetic patients.

2. Method

2.1 Research Subjects

In 2021-2022, a nationwide set of questions poll was carried out on sick person with kind 2 diabetes mellitus. Addition standard: encounter the WHO symptomatic criteria (World Health Organization, 1999); the patient is a grown-up; the patient's intellectual state, perception and behavior are excellent. Ban criteria: uncontrollable

illness such as malignant growth. The collection manner takes on the online accumulation method, and the sick person facts is particularly secret. After the questionnaire was collected, a sum of 238 sound set of questions were calm.

2.2 Research Tools

(1) CDSMS, compiled by Lorig et al. (Lorig, K. R., et al., 1999), contains corporal action, cognitive sign management, and communication with physician. The reliability and soundness of the scale was checked, the Cronbach's α coefficient was greater than 0.901, and the Spearman-Brown coefficient was 0.773. And the KMO of this measurement flake is 0.914, the validity of the scale is excellent.

(2) SRF-S, compiled by Nes et al. (Nes, L.S., Ehlers, S.L., Whipple, M.O., & Vincent, A., 2013) and translated into Chinese by Wang Ligang et al. (Wang Ligang, Zhang Jingyi, Wang Jia, Tao Ting, Fan Chunlei & Gao Wenbin, 2015). The reliability and soundness of this scale was checked, the Cronbach's alpha coefficient was 0.935, and the Spearman-Brown coefficient was 0.937, indicating that the flake had good reliability. And the KMO of the scale is 0.948, the validity of the scale is excellent.

(3) Chronic Disease Self-Efficacy Scale (Lorig, K. R., Sobel, D. S., Ritter, P. L., Laurent, D., & Hobbs, M., 2001). This counter was put together by Lorig et al, through the reliability and validity check of this flake, the Cronbach's α coefficient is identical to 0.957, and the Spearman-Brown coefficient is 0.95, indicating that the reliability of the scale is good. And KMO is equal to 0.937, the validity of the scale is excellent.

2.3 Statistical Methods

SPSS25.0 and AMOS24.0 were used for statistical analysis, and the samples were topic to recurrence analysis, separate specimen T test, analysis of difference, multiple linear regression, and way analysis.

3. Results

3.1 Sample Distribution

Table 1. Sample distribution

Category		Number	Proportion (%)
Gender	Male	110	46.2
	Female	128	53.8
Age	≥60	115	48.3
	<60	123	51.7
Cultural level	Elementary school and below	25	10.5
	junior high school	99	41.6
	high school	51	21.4
	University and above	63	26.5
Diabetes complications	Yes	61	25.6
	No	177	74.4
BMI	≥24	115	48.3
	<24	123	51.7
Monthly household income	≤3000RMB	38	16
	3001-5000RMB	138	58
	>5000RMB	62	26.1
Living alone	Yes	110	46.2
	No	128	53.8

From the distribution in the above table, we can see that among the 238 type 2 diabetes patients surveyed in this survey, female description for the majority, accounting for 53.8%; from the age delivery, 48.3% were ≥60 years old, and patients <60 years old accounted for 51.7%; in language of ethnic level, most persons were in minor high school teaching position, accounting for 41.6%, followed by college and above, high school, chief school and below, accounting for 26.5%, 21.4%, and 10.5% respectively; in terms of diabetes complications, 25.6% of the patients had complications, and 74.4% of the patients did not have complications; in terms of BMI, most

patients were at the level of BMI<24, accounting for 51.7%, followed by BMI≥24, accounting for 48.3%; in terms of monthly household income, 58% of the patients were in the stage of 3001-5000RMB, followed by >5000RMB and ≤3000RMB, accounting for 26.1% and 16% respectively; in terms of living alone, 46.2% of the patients were in the state of being alone, and 53.8% of the patients were not living alone.

3.2 Analysis of Influencing Factors of Diabetes Self-Efficacy

The consequence of linear regression analysis of self-efficacy in Table 2 shows that the be the right size of the linear model is excellent, R2=0.721>0.6, and the ANOVA results show that the regression equating is important (F=65.41, P<0.001). The consequence of this regression coefficient indicates that age, living alone and self-management behaviors can significantly positively affect the self-efficacy of patients, while self-regulation fatigue negatively affects the self-efficacy of diabetic patients (P<0.05).

Table 2. Linear regression analysis of self-efficacy

Model	Unstandardized coefficients		Standardized coefficient	t	significance
	B	Standard error	Beta		
(Constant)	1.766	0.947		1.864	0.064
Age	0.778	0.231	0.174	3.366	0.001
Gender	-0.186	0.164	-0.041	-1.135	0.257
Cultural level	0.071	0.097	0.031	0.727	0.468
Diabetes complications	0.082	0.198	0.016	0.416	0.677
BMI	0.298	0.211	0.067	1.411	0.160
Monthly household income	0.271	0.153	0.078	1.77	0.078
Living alone	0.438	0.203	0.098	2.158	0.032
Self-regulation fatigue	-0.498	0.163	-0.187	-3.047	0.003
Self-management behavior	1.205	0.165	0.441	7.304	<0.001
R^2			0.721		
F			65.41		
P			<0.001		
Dependent variable: Self-efficacy					

3.3 Analysis of the Mediating Effect of Self-Efficacy in Self-Regulation Fatigue and Self-Management Behavior

According to the reason of this research, the theoretical path model diagram is tensed in AMOS computer program, and the poll data is fetched the road compulsion model diagram, the consequence is indicated in Figure 1.
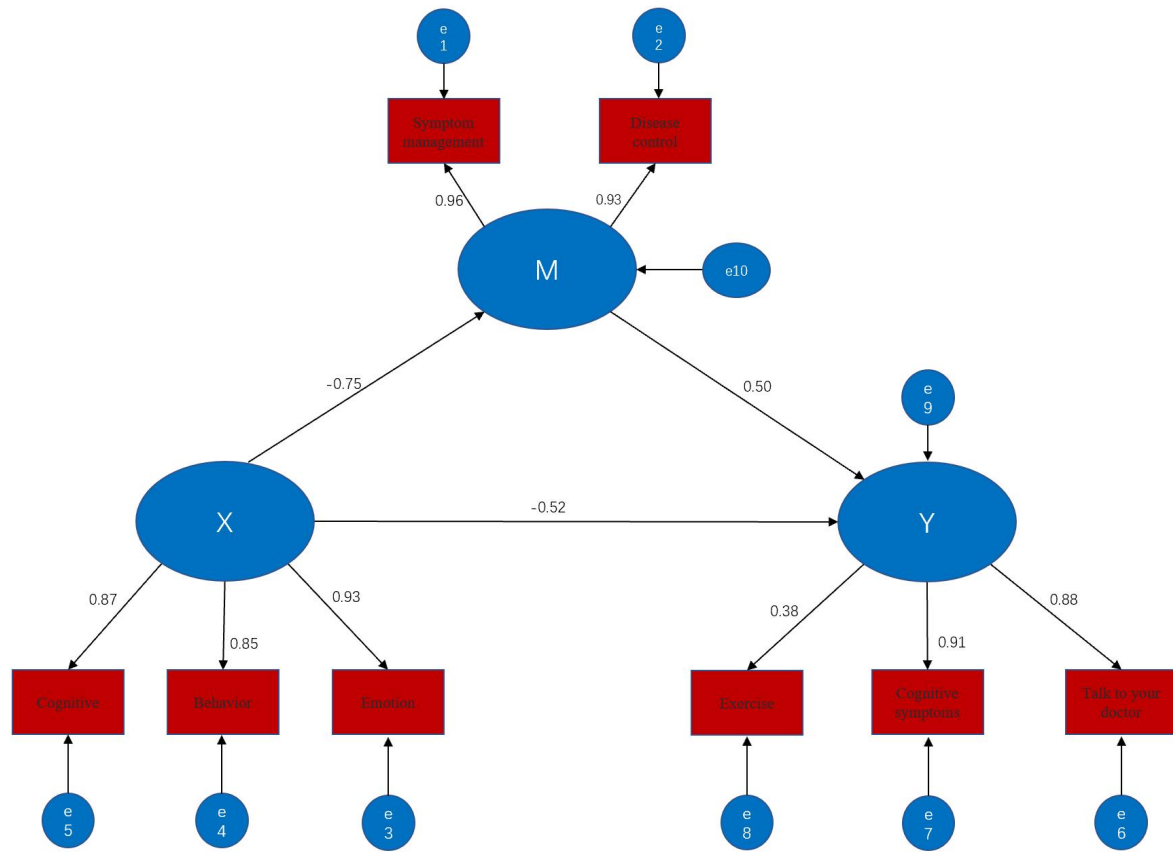
Figure 1. Path Analysis Diagram

Note: X pass on self-regulation fatigue, Y pass on self-management behavior, M pass on self-efficacy.

First, the appropriate position between the above path diagram and the actual data is indicated in Table 3.

Table 3. Fitting of the path diagram and the actual data

Fit metrics	CMIN/DF	RMR	RMSEA	GFI	AGFI	NFI	TLI	CFI
Fit criteria	<3	<0.05	(<0.08 good) (<0.05 excellent)	>0.90	>0.90	>0.90	>0.90	>0.90
Operation result	8.083	0.103	0.173	0.877	0.740	0.924	0.889	0.933

The above fitting results show that the road map fits well with the data, CFI=0.933; to further improve the fit, future research can add some independent or mediating variables that have an impact on the self-management behavior of the dependent variable. This is our next direction for future research and improvement.

The relationship between the following variables is shown in Table 4.

Table 4. Path coefficients

			Unnormalized path coefficients	normalized path coefficients	S.E.	C.R.	P
Self-efficacy	<---	Self-regulation fatigue	-2.064	-0.747	0.148	-13.984	***
Self-management behavior	<---	Self-efficacy	0.243	0.499	0.028	8.627	***
Self-management	<---	Self-regulation	-0.699	-0.52	0.079	-8.795	***

			Unnormalized path coefficients	normalized path coefficients	S.E.	C.R.	P
behavior		fatigue					
Symptom management	<---	Self-efficacy	1.000	0.963			
Disease management	<---	Self-efficacy	1.006	0.929	0.038	26.654	***
Mood	<---	Self-regulation fatigue	1.000	0.928			
Behavior	<---	Self-regulation fatigue	1.073	0.850	0.056	19.304	***
Cognition	<---	Self-regulation fatigue	0.990	0.872	0.048	20.462	***
Communicate with a doctor	<---	Self-management behavior	1.000	0.877			
Cognitive symptom management	<---	Self-management behavior	0.968	0.911	0.048	20.250	***
Physical activities	<---	Self-management behavior	0.276	0.382	0.046	6.009	***

Note: *** means P<0.001.

It can be clearly seen from the operation results of the above table:

(1) Self-regulation fatigue can significantly negatively affect self-efficacy, with an influence coefficient of -0.747, P<0.05.

(2) Self-efficacy can significantly and positively affect self-management behavior, with an influence coefficient of 0.499, P<0.05.

(3) Self-regulation fatigue can significantly negatively affect self-management behavior, with an influence coefficient of -0.52, P<0.05.

After analyzing the above path analysis, we need to continue to examine the mediation effect, as shown in Table 5.

Table 5. Mediation effect

Independent variable	Intermediary	Dependent variable	General intermediary	Direct effect	Total effect
Self-regulation fatigue	Self-efficacy	Self-management behavior	-0.375	-0.52	-0.895
α		0.418			
P		<0.05			

Note: α is the proportion of the mediation effect to the total effect

From the analysis results in Table 5, it can be clearly seen that:

Self-efficacy played a negative mediating role between self-regulation fatigue and physical activity, the total mediation was -0.375, and the mediation ratio was 41.8%. The mediating effect was significant (P<0.05), meaning that self-efficacy could alleviate the negative impact of self-regulation fatigue on self-management behavior.

4. Conclusion

The consequences of multiple linear regression indicated that age, living alone, and self-management behaviors

can significantly positively influence the self-efficacy of sick person, while self-regulation fatigue negatively affects the self-efficacy of diabetic patients (P<0.05). AMOS model check that self-regulation fatigue can significantly negatively affect self-efficacy and self-management behavior, P<0.05; self-efficacy can significantly positively influence self-management behavior, P<0.05. Self-regulation fatigue can not only directly negatively affect self-management behavior, but also through self-efficacy to indirectly affect self-management behavior (P<0.05). Moreover, self-efficacy can effectively improve and control the negative effect of self-regulation fatigue on self-management behavior, the total mediation is -0.375, the mediation ratio is 41.8%, and the mediation effect is significant (P<0.05). Therefore, it is recommended that hospital staff learn and master the relationship and relationship among self-regulation fatigue, self-efficacy, and self-management behavior in diabetic patients to control and improve type 2 diabetes in future clinical activities.

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