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Self-Efficacy Approach Through Social Cognitive in Enhancing Knowledge About Hypoglycemia Prevention in Diabetes Mellitus Patients Year 2023

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ABSTRACT

Hypoglycemia poses a greater risk to individuals with diabetes mellitus if left undetected or unprevented. Health education rooted in cognitive theory offers an alternative to bolster the self-efficacy of diabetes mellitus (DM) patients, ultimately enhancing their knowledge of hypoglycemia prevention. This study seeks to assess the impact of applying cognitive theory through a self-efficacy approach on the augmentation of knowledge regarding hypoglycemia prevention among patients with diabetes mellitus. The research employs a Quasi-Experimental method with a one-group pre-test post-test design. A sample size of 55 participants was selected using purposive sampling. The intervention in this study consists of health education utilizing a social cognitive theory approach. The findings reveal noticeable disparities in pre-test and post-test knowledge scores on hypoglycemia prevention among the 55 respondents, with a mean score of 17.82 in the pre-test and 22.15 in the post-test. The results of the t-test indicate a significance level of $p < 0.05$ ($p = 0.00$). In conclusion, cognitive theory, when implemented with a self-efficacy approach, has a demonstrable influence on increasing knowledge about hypoglycemia prevention in patients with diabetes mellitus. For future research, it is advisable to incorporate patient self-efficacy control measures to further enhance patient knowledge regarding hypoglycemia prevention.

Keywords : Social Cognitif Theory, Knowledge and Preventif, Hipoglicemia, Diabetes Mellitus

1. INTRODUCTION

Individuals with diabetes mellitus (DM) face a heightened risk of experiencing hypoglycemia, especially if they use insulin or specific medications to regulate their blood sugar levels (Ortiz, 2017). Preventing hypoglycemia in DM patients is crucial as this condition can lead to the onset of various serious complications, such as seizures, loss of consciousness, and in some cases, even fatalities (Care & Suppl, 2021).

A population study conducted in the UK found that the risk of death due to hypoglycemia in individuals with diabetes increases with age and the duration of diabetes. In the 60-69 age group, the incidence of death due to hypoglycemia is approximately 3 deaths per 100,000 people per year. However, in the age group over 80 years, the incidence increases to 20 deaths per 100,000 people per year (Tzoulaki et al., 2019). Nevertheless, the exact number of deaths due to hypoglycemia in diabetes patients is often difficult to determine because hypoglycemia is frequently unreported or not identified as the cause of death. Therefore, it is essential to ensure that individuals with diabetes can prevent

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hypoglycemia through proper management and continuous monitoring of their blood sugar levels (Rashighi & Harris, 2017).

Self-management is a critical program in diabetes management. Chronic diseases like diabetes require daily attention to maintain optimal blood sugar levels, prevent complications, and improve overall health outcomes (Masithoh Fitri & Priyanto, 2017; Nurhayati & Sari, 2020) (Handayani, 2021). Self-efficacy is one of the fundamental components that must be developed in diabetes patients to maintain consistency and self-management in controlling their blood sugar levels (Shan et al., 2019).

Many approaches have been employed to enhance self-management in DM patients, but most of them focus solely on lowering blood sugar levels in diabetes patients and do not yield results in preventing the risk of hypoglycemia in these individuals (Krishnakumar et al., 2021).

Several types of self-efficacy that can be utilized include control belief, emotional control, cultural approaches, and social cognitive approaches (Bandura, 1997). The social cognitive approach is considered more effective in enhancing patient self-efficacy because it involves the role of the social environment in shaping self-efficacy. It emphasizes the importance of observing others who have succeeded in similar situations, as well as receiving social support and verbal encouragement from individuals and groups around us. These are crucial aspects of boosting self-efficacy as we are often influenced by those around us. Furthermore, the Social Cognitive Theory regards personal experience as a key factor in forming self-efficacy. This allows individuals to build their confidence through real experiences and achievements. In this regard, the theory underscores that through actual accomplishments, individuals can feel more confident in facing similar tasks in the future (Smith et al., 2020).

On the other hand, interventions to prevent complications through early detection education and patient knowledge about hypoglycemia have also been widely implemented (Edridge et al., 2015). One of these interventions is early detection and online-based hypoglycemia prevention education. Previous research conducted by Zakariyati & Alamsyah (2022) found that the use of mobile applications can enhance the knowledge of DM patients in preventing and early detecting hypoglycemia (Zakariyati & Alamsyah, 2022). However, a weakness in the previous research is that some DM patients still require supervision from their families, even though DM patients should be capable of independently performing early detection and hypoglycemia prevention. Therefore, it is crucial to continue this research with a focus on self-efficacy, as examined through the Social Cognitive Theory (SCT).

The Social Cognitive Theory has been applied in various fields, including education, health, and business, to comprehend and promote behavioral change. It has also been utilized to develop interventions targeting specific behaviors, such as smoking cessation or weight loss, by addressing the underlying cognitive and social factors contributing to these behaviors (Sawitri et al., 2015). Through the self-efficacy approach, knowledge of hypoglycemia prevention and early detection by DM patients can consistently enhance self-management in DM2 patients.

This research is of utmost importance, considering that previous research has mainly focused on providing education without considering patient self-efficacy, which can have an influence on knowledge related to hypoglycemia prevention in DM patients. Therefore, utilizing self-efficacy through the SCT can have an impact on the improvement and consistency of hypoglycemia prevention in DM patients. The objective of this study is to determine the influence of Self-Efficacy with the Social Cognitive Theory on the enhancement of knowledge regarding hypoglycemia prevention in DM patients.

2. METHODS

The research design is a quasi-experimental study with a one-group pretest-posttest design. This research does not employ a comparison group but uses an initial test to precisely determine the magnitude of the effect or impact of using mind mapping. The research design is focused on one group, with measurements conducted before and after the

intervention. It follows a one-group pretest and posttest design.

In this research, the intervention will initially focus on the patients to assess the self-efficacy of DM patients. The study takes place over a 3-month period at the Monginsidi Health Center in the Mariso Subdistrict of Makassar City, starting from June to August 2023. The research process begins with the recruitment of samples, with a total of 55 DM patients selected using purposive sampling. Inclusion criteria are as follows: 1) Adult male or female patients aged 40-60 years at the time of registration, diagnosed with Diabetes Mellitus by a doctor, 2) Good hearing ability, 3) Proficiency in the Indonesian language, 4) No history of major surgery in the past 5 months or plans for any major surgery in the next 5 months, 5) No medical conditions preventing them from walking for 15 to 30 minutes a day. Exclusion criteria include: 1) Diagnosis of type 1 diabetes, gestational diabetes, young-onset diabetes, or other forms of diabetes, 2) History of serious illnesses such as a heart attack or stroke within the last year, 3) Pregnancy, breastfeeding, or planning to become pregnant.

Next, a pre-test will be conducted, followed by the intervention using the Self-Efficacy approach through the Social Cognitive Theory. In addition to the patients, the research team will include facilitators and doctors who will provide information and counseling to both the families and the DM patients. In this research group, interventions will be provided, including Nutritional Needs and Nutritional Management for DM patients, Checkup Calendar, Independent Activity Calendar, Hypoglycemia Prevention, and Early Detection of Hypoglycemia. The final step is to conduct a post-test to measure the improvement in knowledge about hypoglycemia prevention.

The data collection technique used in this research involves using questionnaires on knowledge and hypoglycemia prevention as well as self-efficacy among the research samples. The ethical research permit is designated as: B/011/LPPM/IX/2023.

3. RESULT AND DISCUSSION

3.1. Research Result

Table. 1 Frequency Distribution of Diabetes Mellitus Patient Characteristics

No	Characteristics	n	%
	Gender		
1	Male	13	23,6
2	Female	42	76,4
	Total	**55**	**100**
	Age		
1	>75	7	12.7
2	60-75	27	49.1
3	46-59	18	32.7
4	30-45	3	5.5
	Total	**55**	**100.0**
	Education		
1	Bachelor's /Diploma	6	10.9
2	High School	18	32.7
3	Junior High School	12	21.8
4	Elementary School	19	34.5
	Total	**55**	**100**
	Occupation		
1	ASN	5	9.1
2	Entrepreneur	11	20.0
3	Farmer	4	7.3
4	Retiree	35	63.6
5	Not Working	5	9.1
	Total	**55**	**100**
	Duration of DM		
1	0-5 Years	26	47.3
2	6-10 Years	20	36.4
3	11-15 Years	9	16.4
	Total	55	**100**

Table 1 shows the characteristics of the respondents, with the largest proportion being female, totaling 42 individuals (76.4%). Additionally, the largest age group among the respondents falls in the 60-75 years category, comprising 27 individuals (49.1%). The most common educational background among the respondents is elementary school (SD), with 19 individuals (34.5%). Furthermore, the majority of the respondents have retired as their

occupation, accounting for 35 individuals (63.6%). The duration of living with diabetes (DM) is most commonly in the range of 0-5 years, with 26 individuals (47.3%).

Table. 2 Normality Test

No	Variable	Sig	Ket.
1	*Pretest*	0,67	Normal
2	*Post Test*	0,82	Normal

Table 2 shows that the results of the normality test for the variable "knowledge of hypoglycemia prevention," using the Kolmogorov-Smirnov test, yielded a pre-test p-value of 0.67 (p>0.05), indicating a normal distribution. The data for the control group also had a p-value of 0.82 (p>0.05), indicating a normal distribution. Therefore, parametric testing can be continued, and a paired sample t-test will be used

Table. 3 T-Test of the Influence of Cognitive Theory with a Self-Efficacy Approach on the Improvement of Knowledge About Hypoglycemia Prevention in Diabetes Mellitus Patients

Paired Samples Test						
	Paired Differences			t	df	Sig. (2-tailed)
	Mean	95% Conf. Interval of the Difference				
		Lower	Upper			
Pre_Test - Post_Test	-4.327	-5.096	-3.559	-11.293	54	**.000**

Based on Table 3, the paired samples test (t-test) output shows that the two-tailed p-value is 0.000, which is less than 0.05. This means that both the null hypothesis (H0) and the alternative hypothesis (Ha) are accepted. Therefore, it can be concluded that there is a significant difference in the average knowledge of hypoglycemia prevention between the pre-test and post-test, indicating the influence of applying the Social Cognitive Theory (SCT) with a Self-Efficacy Approach on the improvement of knowledge about hypoglycemia prevention in diabetes mellitus patients.

The "Paired Sample Test" output table also provides information that the mean difference is -11.293. This value represents the difference between the pre-test and post-test knowledge averages. The difference ranges from -5.096 to -3.559 with a 95% confidence interval (Lower of the Difference and Upper).

3.2 Discussion

1. Respondent Characteristics

Table 1 shows that the most dominant gender in the sample of DM patients is female, with a total of 42 individuals (76.4%). Meanwhile, the most dominant age group among DM patients is 60-75 years old, with a total of 27 individuals (49.1%). As for education, the majority of patients have an elementary school (SD) education, totaling 19 (34.5%). This aligns with a study conducted by Arania et al. (2021), which found that factors influencing the occurrence of DM include age, gender, and patients' educational background.

The aging process gradually progresses through several stages, with the transition phase occurring in the 35-45 age range. During this phase, signs of aging begin to manifest with indications of declining physiological functions in the body, which can potentially lead to various diseases. In the transition phase, the symptoms and signs of aging become more noticeable. Furthermore, there is a clinical stage that typically occurs in individuals aged 45 and above, during which all bodily systems, such as the immune system and metabolism, experience a decline.

The results indicate that DM is more prevalent among female patients. This is because estrogen and progesterone hormones have the capacity to enhance insulin responsiveness in the bloodstream. When someone enters menopause, insulin responsiveness tends to decrease due to low levels of estrogen and progesterone hormones. Another contributing factor is that many women do not maintain their ideal body weight, which can reduce the sensitivity of insulin responsiveness. For these reasons, women tend to have a higher risk of developing diabetes compared to men (Lowe et al., 2022).

In terms of patients' educational background, it is predominantly characterized by low education levels, such as elementary school (SD). The higher a patient's level of education, the more capable they are of protecting themselves against the occurrence of DM. Individuals with higher education levels generally possess a broader knowledge of health (Jean-François Yale MD, CSPQ et al., 2018). The level of education also impacts an individual's physical activity level, often related to the type of work they do. Individuals with higher levels of education tend to work in office environments with limited physical activity, while those with lower education levels more frequently work as laborers or farmers with more intensive physical activity (Arania et al., 2021). This can be seen in the results of the respondents' occupational characteristics, where most patients are not engaged in activities, with the largest group being retirees, totaling 35 individuals (63.6%). This indicates that when someone stops working, their level of activity decreases.

The duration of DM in the research sample is most commonly 0-5 years, meaning that the average DM patients in the sample have recently experienced DM-related issues or have just sought medical attention at health facilities. Research conducted by Mildawati et al. (2019) has found that factors such as age, gender, and the duration of DM are associated with the risk of complications. The longer an individual has had diabetes, the higher the risk of complications. Researchers assume that the distribution of age, gender, education, and occupation are closely related to the knowledge of DM patients in preventing hypoglycemia..

2. The Self-Efficacy Approach through Social Cognitive Theory in Enhancing Knowledge About Hypoglycemia Prevention in Diabetes Mellitus Patients in 2023

The results of the t-test in Table 3 indicate a p-value of 0.00, which is less than 0.05. This means that the null hypothesis (H0) is rejected, and the alternative hypothesis (Ha) is accepted. This signifies that there is an influence of cognitive theory therapy with a self-efficacy approach on the improvement of knowledge regarding hypoglycemia prevention in DM patients.

The intervention on self-efficacy aims to enhance an individual's belief in their ability to succeed in various tasks or situations. Increased self-efficacy can motivate individuals to take more effective and high-performance actions (Irie, 2021).

Self-efficacy has a positive effect on the improvement of knowledge about hypoglycemia prevention, influencing an individual's belief in their ability to enhance their knowledge of how to prevent hypoglycemia. In this context, self-efficacy can impact an individual's motivation and efforts in seeking, comprehending, and adopting the necessary information to avoid hypoglycemia (Kase & Siyoto, 2021).

The Social Cognitive Theory has been applied in various fields, including education, health, and business, to understand and promote behavior change. It has also been used to develop interventions targeting specific behaviors, such as smoking cessation or weight loss, by addressing the cognitive and social factors underlying these behaviors (Sawitri et al., 2015).

The results of this study align with the findings of Smith et al. (2020), which demonstrate that the Social Cognitive Theory (SCT) has been proven to enhance health behavior by altering cognitive processes and increasing individuals' belief in their ability to accomplish a task. Interventions adopting the SCT approach encourage individuals to engage in self-management by enhancing their understanding of diabetes self-management. This understanding can be described as general knowledge of how to manage diabetes independently. Additionally, research conducted by Borhaninejad et al. (2017) reveals a significant relationship between the constructs of the Social Cognitive Theory (knowledge, self-efficacy, social support, outcome expectations, outcome expectancies, and self-regulation) and the self-care scores of DM patients. Self-care is an active process that must be employed daily by diabetes patients to more efficiently control their condition.

The results of this study also indicate that health education is indeed effective in improving knowledge and preventing

hypoglycemia in DM patients. This is consistent with the findings of previous research conducted by Dharmastuti & Dwi Ariani Sulistyowati (2017), which showed that health education has an impact on increasing knowledge about hypoglycemia prevention in DM patients. Health education is highly beneficial for enhancing the knowledge of diabetes mellitus patients (Wysocki et al., 2003).

The goal of providing health education to DM patients is to improve an individual's health status, prevent the possible occurrence of complications such as hypoglycemia, maintain the existing level of health, maximize the role and function of patients during illness, provide support to patients and their families in dealing with health issues, especially those related to hypoglycemia, both in terms of management and prevention (Ghoreishi et al., 2019).

The researchers believe that an education approach based on the principles of Social Cognitive Theory, such as observing successful individuals in preventing hypoglycemia, understanding the benefits of prevention, and providing social support, will be more effective in enhancing self-efficacy compared to other approaches.

CONCLUSION

This research shows that among the sampled DM patients, females dominate with a total of 42 individuals (76.4%). The most common age range for DM patients is between 60-75 years, accounting for 27 individuals (49.1%). In terms of education, the majority of the sample have completed elementary school (SD), with 19 individuals (34.5%). Among the sampled occupations, retirees are the largest group, totaling 35 individuals (63.6%). Regarding the duration of suffering from DM, the most common range is 0-5 years, with 26 individuals (47.3%). The t-test results indicate a p-value of 0.00, which is less than 0.05, signifying an influence of the Self-Efficacy Approach through Social Cognitive Theory in Enhancing Knowledge About Hypoglycemia Prevention in Diabetes Mellitus Patients in the year 2023.

RECOMMENDATION

Family members of DM patients should be more active in monitoring the DM patients to prevent the occurrence of hypoglycemia. Additionally, healthcare professionals are obligated to provide health education to all DM patients, both those receiving treatment at healthcare facilities and within the community, to prevent the occurrence of hypoglycemia.

REFERENCES

Arania, R., Triwahyuni, T., Esfandiari, F., & Nugraha, F. R. (2021). Hubungan Antara Usia, Jenis Kelamin dan Tingkat Pendidikan Dengan Kejadian DM di Klinik MArdi Waluyo Lampung Tengah. *Jurnal Medika Malahayati*, *5*(September), 146–153.

Bandura. (1997). *Self Efficacy. The Exercise of Contro*. W.H. Froeman and Company.

Borhaninejad, V., Iranpour, A., Shati, M., Tahami, A. N., Yousefzadeh, G., & Fadayevatan, R. (2017). Predictors of Self-care among the Elderly with Diabetes Type 2: Using Social Cognitive Theory. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, *11*(3), 163–166. https://doi.org/10.1016/j.dsx.2016.08.017

Care, D., & Suppl, S. S. (2021). Pharmacologic approaches to glycemic treatment: Standards of medical care in diabetesd2021. *Diabetes Care*, *44*(January), S111–S124. https://doi.org/10.2337/dc21-S009

Dharmastuti, A. P., & Dwi Ariani Sulistyowati. (2017). Pengaruh Pendidikan Kesehatan Terhadap Upaya Pencegahan Hipoglikemia Pada Pasien Diabetes Mellitus. *Jurnal Keperawatan Global*, *2*(1), 52–57. http://jurnal.poltekkes-solo.ac.id/index.php/JKG/article/view/342

Edridge, C. L., Dunkley, A. J., Bodicoat, D. H., Rose, T. C., Gray, L. J., Davies, M. J., & Khunti, K. (2015). Prevalence and incidence of hypoglycaemia in 532,542 people with type 2 diabetes on oral therapies and insulin: A systematic review

and meta-analysis of population based studies. *PLoS ONE*, *10*(6), 1–15. https://doi.org/10.1371/journal.pone.0126427

Ghoreishi, M. S., Vahedian-shahroodi, M., Jafari, A., & Tehranid, H. (2019). Self-care behaviors in patients with type 2 diabetes: Education intervention base on social cognitive theory. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, *13*(3), 2049–2056. https://doi.org/10.1016/j.dsx.2019.04.045

Handayani, T. (2021). *the Effect of Diabetes Self-Management Education (Dsme) Program on Quality of Life in Diabetes Mellitus Patients*. *6*(December 2020), 10–13.

Irie, K. (2021). Self-Efficacy. In *The Routledge Handbook of the Psychology of Language Learning and Teaching*. https://doi.org/10.1177/0032885512472964

Jean-François Yale MD, CSPQ, F., Breay Paty MD, FRCPC, Peter A. Senior MBBS, PhD, F., & KEY. (2018). Monitoring Glycemic Control Diabetes: Canada Clinical Practice Guidelines Expert Committee. *Canadian Journal of Diabetes*, *42*, 47–53. https://doi.org/10.1016/j.jcjd.2017.10.007

Kase, S. M., & Siyoto, S. (2021). Self-Efficacy Analysis on Sugar Levels in Diabetes Mellitus Patients: Literature Review. *Open Access Health Scientific Journal*, *2*(1), 6–10. https://doi.org/10.55700/oahsj.v2i1.13

Krishnakumar, A., Verma, R., Chawla, R., Sosale, A., Saboo, B., Joshi, S., Shaikh, M., Shah, A., Kolwankar, S., & Mattoo, V. (2021). Evaluating glycemic control in patients of South Asian origin with type 2 diabetes using a digital therapeutic platform: Analysis of real-world data. *Journal of Medical Internet Research*, *23*(3). https://doi.org/10.2196/17908

Lowe, R. N., Williams, B., & Claus, L. W. (2022). Diabetes: how to manage patients experiencing hypoglycaemia. *Drugs in Context*, *11*, 1–12. https://doi.org/10.7573/dic.2021-9-11

Masithoh Fitri, R., & Priyanto, S. (2017). Optimalisasi Self Monitoring Blood Glucose Pasien Diabetes Melitus dalam Melakukan Deteksi Episode Hipoglikemia di Wilayah Kerja Puskesmas Kabupaten Magelang. *Urecol*, 73–82.

Mildawati, Diani, N., & Wahid, A. (2019). Hubungan Usia, Jenis Kelamin dan Lama Menderita Diabetes dengan Kejadian Neuropati Perifer Diabateik. *Caring Nursing Journal*, *3*(2), 31–37.

Nurhayati, C., & Sari, N. A. (2020). Hubungan Tingkat Pengetahuan Hipoglikemia Dengan Kemampuan Deteksi Hipoglikemia Pasien Dm Tipe 2. *Indonesian Jurnal of Health Development Vol.2 No.1*, *2*(1), 1–8.

Ortiz, M. R. (2017). Hypoglycemia in Diabetes. *Nursing Clinics of North America*, *52*(4), 565–574. https://doi.org/10.1016/j.cnur.2017.07.006

Rashighi, M., & Harris, J. E. (2017). Hypoglycemia among Patients with Type 2 Diabetes: Epidemiology, Risk Factors, and Prevention Strategies Richard. *Physiology & Behavior*, *176*(3), 139–148. https://doi.org/10.1053/j.gastro.2016.08.014.CagY

Sawitri, D. R., Hadiyanto, H., & Hadi, S. P. (2015). Pro-environmental Behavior from a SocialCognitive Theory Perspective. *Procedia Environmental Sciences*, *23*(Ictcred 2014), 27–33. https://doi.org/10.1016/j.proenv.2015.01.005

Shan, R., Sarkar, S., & Martin, S. S. (2019). *Digital health technology and mobile devices for the management of diabetes mellitus : state of the art*. 877–887.

Smith, Y., Garcia-Torres, R., Coughlin, S. S., Ling, J., Marin, T., Su, S., & Young, L. (2020). Effectiveness of social cognitive theory-based interventions for glycemic control in adults with type 2 diabetes mellitus: Protocol for a systematic review

and meta-analysis. *JMIR Research Protocols*, *9*(9), 1–11. https://doi.org/10.2196/17148

Tzoulaki, I., Molokhia, M., Curcin, V., Little, M. P., Millett, C. J., Ng, A., Hughes, R. I., Khunti, K., Wilkins, M. R., Majeed, A., & Elliott, P. (2019). Risk of cardiovascular disease and all cause mortality among patients with type 2 diabetes prescribed oral antidiabetes drugs: Retrospective cohort study using UK general practice research database. *BMJ (Online)*, *339*(7736), 35. https://doi.org/10.1136/bmj.b4731

Wysocki, T., Harris, M. A., Mauras, N., Fox, L., Taylor, A., Jackson, S. C., & White, N. H. (2003). Absence of adverse effects of severe hypoglycemia on cognitive function in school-aged children with diabetes over 18 months. *Diabetes Care*, *26*(4), 1100–1105. https://doi.org/10.2337/diacare.26.4.1100

Zakariyati, & Alamsyah. (2022). Pengaruh Edukasi Melalui Media Sosial Whatsapp Terhadap Peningkatkan Pengetahuan Penderita Diabetes Melitus Tentang Deteksi Dan Penatalaksanaan Hipoglikemia. *Jurnal Kesehatan Delima Pelamonia*, *6*(1).