



**SELF EFFICACY AMONG PATIENTS WITH DIABETES MELLITUS TYPE 2 IN  
COMMUNITY HEALTH CENTER**

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**ABSTRACT**

Type 2 diabetes mellitus (T2DM) is a growing global health problem, especially in Indonesia. Self-efficacy or an individual's belief in their ability to manage their health, plays an important role in diabetes management. This study aims to describe the level of self-efficacy in T2DM patients at Toapaya Health Center and identify factors that influence this self-efficacy. This study used a descriptive design with purposive sampling, involving 51 respondents who met the inclusion criteria. Data were collected through the Diabetes Management Self-Efficacy (DMSE) questionnaire and analyzed using frequency distribution. The results showed that 27 respondents (52.94%) had low self-efficacy, while 24 respondents (47.06%) had high self-efficacy. Internal and external factors that contribute to the level of patient self-efficacy, such as knowledge, personal experience, social support, and interaction with health workers, were identified. This study emphasizes the importance of improving the self-efficacy of T2DM patients through education and social support programs.

Keywords: diabetes mellitus; health center; self-efficacy

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**INTRODUCTION**

Type 2 diabetes mellitus (Type 2 DM) has become a significant global health problem, with increasing prevalence in various parts of the world, including in Indonesia (Xu et al., 2018). This condition is characterized by insulin resistance and impaired glucose metabolism, which if not managed properly can lead to various serious complications (Shaban et al., 2024). Long-term complications of Type 2 DM include cardiovascular disease, neuropathy, nephropathy, and retinopathy, all of which can drastically reduce a patient's quality of life (Sukma Wicaturatmashudi et al., 2024). Patients often face challenges in adhering to the medications and lifestyle changes needed to control their blood sugar levels, which in turn can lead to psychological problems such as depression and anxiety (E.-Y. Lee et al., 2021).

In Indonesia, the prevalence of type 2 DM shows an alarming number and has continued to increase in recent years. Based on data from the International Diabetes Federation (IDF) 2023, it is estimated that there are around 19.5 million adults living with diabetes in Indonesia, with the majority of cases being Type 2 DM (Dehesh et al., 2020). This figure shows a significant increase compared to previous years, reflecting the same trend globally. Previous research shows that the prevalence of diabetes in Indonesia has reached 8.56%, with a higher proportion found in the population aged over 45 years (Castillo-Hernandez et al., 2021). In addition, risk factors such as obesity, unhealthy diet, and lack of physical activity contribute to the increasing prevalence of Type 2 DM (Foti et al., 2020).

Diabetes mellitus has a significant impact on patient self-efficacy, namely an individual's belief in their ability to manage their health condition (Riihimies et al., 2020). Diabetic

patients often face complex challenges, such as controlling blood sugar levels, following a healthy diet, and maintaining an exercise routine, which can affect their level of self-confidence (Hurst et al., 2020). Success in managing diabetes, such as maintaining stable blood sugar levels, can increase patients' self-efficacy, making them feel more capable and confident in facing challenges (JafarBeglu & Mehdad, 2020). However, if patients experience difficulties, such as unstable blood sugar levels or the emergence of complications, this can reduce their self-efficacy, causing frustration and hopelessness, which in turn can potentially lead to neglect of care (Yang et al., 2020).

Self-efficacy is defined as an individual's belief in their ability to achieve certain goals, which is very important in a health context, especially for Type 2 DM patients (Young et al., 2020). High levels of self-efficacy influence patients' health behaviors, encouraging them to adhere to treatment plans, follow a healthy diet, and maintain an exercise routine (Doherty et al., 2021; Yosep et al., 2023). Previous research has shown that patients with better self-efficacy tend to be more proactive in diabetes management, including having regular check-ups and participating in diabetes education programs (Pérez-Aldana et al., 2021). Previous studies have shown that interventions that increase self-efficacy can significantly improve self-management skills and adherence to treatment, underscoring the importance of developing self-efficacy in diabetes management strategies (E.-Y. Lee et al., 2021). Low self-efficacy can lead to lack of motivation and adherence to treatment, potentially worsening diabetes complications and patient quality of life (Doherty et al., 2021). Although many previous studies have identified self-efficacy in patients with diabetes mellitus (Sarteanu et al., 2021). In addition, the urgency of this study is very high considering the increasing prevalence of Type 2 DM in Indonesia and its significant impact on the quality of life of patients. The purpose of this study is to describe self-efficacy in patients with type 2 DM.

## **METHOD**

This study used a descriptive design to describe the self-efficacy of type 2 diabetes mellitus (DM Type 2) patients who were outpatients at the Toapaya Health Center. The descriptive design was chosen because it can provide comprehensive information about patient characteristics and their level of self-efficacy without conducting interventions. Thus, this study aims to collect relevant data and describe the actual conditions of the population studied. The sample selection in this study used purposive sampling technique, which is the right method to select respondents according to the predetermined inclusion criteria. The inclusion criteria include patients with type 2 diabetes mellitus who are outpatients at the Toapaya Health Center, and are willing to participate as respondents. Prior to sampling, exclusion criteria were also set, including patients with type 1 diabetes and patients with mental disorders, to ensure that the samples taken can accurately represent the population. This study involved 51 respondents with total sampling methods, which is more than enough to provide a comprehensive picture of self-efficacy in patients with type 2 diabetes mellitus at the Health Center.

Data were collected by distributing questionnaires to respondents. Self-efficacy measurement was conducted using the Diabetes Management Self-Efficacy (DMSE) questionnaire consisting of 20 questions. The questions in the questionnaire used a Likert scale consisting of four choices: 1) Disagree, 2) Less agree, 3) Agree, and 4) Strongly agree. The Likert scale is used to measure individual attitudes, opinions, and perceptions of social phenomena. The results of the validity test showed that all question items had a value of  $> 0.361$ , so they were declared valid. In addition, the results of the reliability test using Cronbach's Alpha showed a value of 0.937, which was greater than 0.60, so the instrument was declared reliable. In this

study, ethical considerations are essential to ensure that the rights and welfare of respondents are protected. The principle of autonomy is upheld by providing complete information about the purpose of the study, so that respondents can make informed decisions about their participation. In addition, the principle of justice is applied by selecting respondents fairly, without discrimination based on social or health backgrounds. This study is also committed to the principle of beneficence and maleficence, where the interventions carried out aim to provide benefits to patients with type 2 diabetes mellitus, while the risks or harms that may arise are minimized. Finally, confidentiality is maintained by ensuring that the data collected will be stored securely and used only for research purposes, so that the identities of respondents remain protected. Data analysis was conducted using a frequency distribution test. This study aims to describe the characteristics of respondents, including age, gender, education, occupation, residential status, and duration of DM. In addition, the analysis also aims to describe self-efficacy in type 2 DM patients in the form of a frequency distribution table, which will provide a clear picture of the condition of self-efficacy in the population studied.

## RESULT

Table 1.  
Demographic Characteristics

Variables	f	%
<b>Age (Years)</b>		
20-29	1	2.0
30-39	1	2.0
40-49	13	25.5
50-59	17	33.3
60-69	17	33.3
70-80	2	3.9
<b>Gender</b>		
Man	18	35.3
Woman	33	64.7
<b>Education</b>		
Elementary School	28	54.9
Junior High School	8	15.7
Senior High School	12	23.5
College	3	5.9
<b>Work</b>		
Doesn't work	27	52.9
Civil Servants/TNI/POLRI	2	3.9
Private sector employee	5	9.8
Self-employed	4	7.8
Farmer	6	11.8
Retired	3	5.9
Etc	4	7.8
<b>Residential status</b>		
Living with family	51	100.0
Living alone	0	0.0
Other	0	0.0
<b>Duration of DM (Years)</b>		
1-10	47	92.2
11-20	4	7.8

Table 1 shows the distribution of characteristics of DM patients based on age groups 50-59 years and 60-69 years each totaling 17 respondents (33.3%), 40-49 years totaling 13 respondents (25.5%), 70-80 years totaling 2 respondents (3.9%), 20-29 years and 30-39 years each totaling 1 respondent (2%). For gender characteristics in this study, there were 33 female

respondents (64.7%) and 18 male respondents (35.5%). For the characteristics of respondents based on education, graduated from elementary school as many as 28 respondents (54.9%), graduated from high school 12 respondents (23.5%), graduated from junior high school 8 respondents (15.7%), college 3 respondents (5.9%), Characteristics of respondents based on occupation unemployed or housewives as many as 27 respondents (52.9%), farmers 6 respondents (11.8%), Private employees 5 respondents (9.8%), self-employed and others each 4 respondents (7.8%), Retirees 3 respondents (5.9%), PNS/TNI/POLRI 2 respondents (3.9%). The status of living in residence, all respondents live with family. While the characteristics of respondents based on the duration of suffering from DM 1-10 years as many as 47 respondents (92.2%) and 11-20 as many as 4 respondents (7.8%).

Table 2.

Frequency distribution of self-efficacy of type 2 diabetes patients (n=51)

Self Efficacy	f	%
Low	27	52.94
Tall	24	47.06

The results of the analysis in Table 2 show that of the total 51 respondents, 27 people (52.94%) had a low level of self-efficacy, while 24 people (47.06%) had a high level of self-efficacy.

## DISCUSSION

Self-efficacy, which refers to an individual's belief in their ability to manage a health condition, has been shown to be an important factor in the management of type 2 diabetes mellitus (T2DM). Previous studies have shown that patients with high levels of self-efficacy are more likely to adhere to treatment plans, follow recommended diets, and engage in the physical activity needed to control their blood sugar levels (Riihimies et al., 2020). Previous studies have shown that interventions focused on improving patient self-efficacy through education and social support can significantly improve self-management skills and adherence to treatment (Secher et al., 2021). This suggests that understanding and improving self-efficacy in patients with Type 2 DM is essential for designing effective interventions in diabetes management. In addition, the findings of this study may assist healthcare providers in developing more targeted strategies, thereby improving patients' quality of life and reducing the risk of diabetes-related complications (Biglar Chopoghlo et al., 2021).

The results of the frequency distribution of self-efficacy obtained from the study showed that out of 51 respondents of type 2 diabetes mellitus (DM Type 2) patients, 27 people (52.94%) had a low level of self-efficacy, while 24 people (47.06%) had a high level of self-efficacy. This distribution reflects significant challenges in managing diabetes, where more than half of the respondents felt unsure about their ability to manage their health condition (Doherty et al., 2021). Low levels of self-efficacy can have negative implications for health behaviors, such as adherence to medication and diet plans, potentially increasing the risk of diabetes-related complications (Abraham et al., 2018). Patients with low self-efficacy may feel stuck in the face of daily challenges, while those with high self-efficacy tend to be more proactive in managing their disease, including having regular check-ups and participating in diabetes education programs (Garcia et al., 2022).

Self-efficacy of Type 2 DM patients is influenced by various internal and external factors that interact with each other. Internal factors such as knowledge about diabetes and personal experience in managing the condition play an important role in shaping patients' beliefs about their abilities (Rosli et al., 2022). In-depth knowledge about blood sugar control, healthy eating patterns, and the importance of physical activity can increase patient confidence in

taking proactive steps to manage their disease (Ong-Artborirak et al., 2023). On the other hand, lack of knowledge can lead to confusion and uncertainty, which contribute to low levels of self-efficacy. On the other hand, external factors, such as social support and positive interactions with health workers, also have a significant effect on self-efficacy (X. Wang et al., 2023). Support from family, friends, and community can provide emotional and practical encouragement, while constructive interactions with health care providers, including adequate education and ongoing support, can strengthen patients' confidence in managing diabetes (De Groot et al., 2021).

The level of self-efficacy has a significant influence on the health behavior of patients with Type 2 DM, especially in terms of adherence to medication, diet, and physical activity. Patients with high self-efficacy tend to be more proactive in following recommended treatment plans, maintaining a healthy diet, and participating in physical activities that are important for controlling blood sugar levels (Qasim et al., 2020). Previous research has shown that individuals with strong beliefs about their ability to manage their health are more likely to take positive actions, including adhering to treatment and maintaining a healthy lifestyle (Y. Wang et al., 2020). Another study showed that an intervention designed to improve self-efficacy in diabetes patients significantly improved adherence to medication and physical activity, with patients involved in a health education program reporting improved health behaviors, such as better diet and higher frequency of physical activity (J. Y. Lee et al., 2020). Strategies to improve self-efficacy in patients with Type 2 DM are essential in supporting effective disease management. One of the main interventions that can be done is a diabetes education program, which is designed to provide in-depth knowledge about managing blood sugar levels, the importance of a healthy diet, and physical activity (JafarBeglu & Mehdad, 2020). The program may include skills training, such as how to monitor blood sugar levels and plan healthy meals, so patients feel more confident in managing their condition (du Pon et al., 2020). In addition, social support and family involvement also play a crucial role; support from family, friends, and the community can provide the additional motivation and emotional support needed to adhere to a treatment plan and make lifestyle changes (Qasim et al., 2020).

The results of research on self-efficacy in Type 2 DM patients provide significant implications for clinical practice and health policy, especially in designing more effective interventions in Community Health Centers and other health facilities (Park et al., 2020). The finding regarding the proportion of patients with low levels of self-efficacy suggests the need to develop structured educational programs, which not only provide information about diabetes management, but also train the practical skills necessary for self-management (Zhou et al., 2020). The intervention should consider social support, where the family and community are involved in the care process to create a supportive environment (Lawrence et al., 2021). Recommendations for health care providers include the development of comprehensive support programs that include education, skills training, and regular assessment of patient self-efficacy levels, so that appropriate interventions can be implemented according to individual needs.

## **CONCLUSION**

The results of this study indicate that the level of self-efficacy of type 2 diabetes mellitus (DM Type 2) patients at Toapaya Health Center is still low, with 52.94% of respondents experiencing low self-efficacy and 47.06% having high self-efficacy. The discussion shows that internal factors, such as knowledge about diabetes and personal experience, as well as external factors, such as social support and interaction with health workers, contribute to the level of self-efficacy. High levels of self-efficacy are positively correlated with adherence to

medication, diet, and physical activity, which in turn can reduce the risk of long-term complications. Nursing implications of this study emphasize the importance of developing structured diabetes education programs and skills training to improve patient self-efficacy. Social support from family and community should also be strengthened in the care process to create a supportive environment. For further research recommendations, namely factors that influence self-efficacy in patients with Type 2 DM.

## REFERENCES

- Abraham, M. B., Nicholas, J. A., Smith, G. J., Fairchild, J. M., King, B. R., Ambler, G. R., Cameron, F. J., Davis, E. A., & Jones, T. W. (2018). Reduction in Hypoglycemia With the Predictive Low-Glucose Management System: A Long-term Randomized Controlled Trial in Adolescents With Type 1 Diabetes. *Diabetes Care*, *41*(2), 303–310. <https://doi.org/10.2337/dc17-1604>
- Biglar Chopoghlo, S., Hosseinkhani, A., Khedmat, L., Zaki-Nejad, M., & Puryaghoob, M. (2021). The self-efficacy improvement in adolescent girls with type 1 diabetes mellitus with self-care education through mobile-based social networking. *Int J Diab Dev Ctries*, *41*. <https://doi.org/10.1007/s13410-021-00929-5>
- Castillo-Hernandez, K. G., Laviada-Molina, H., Hernandez-Escalante, V. M., Molina-Segui, F., Mena-Macossay, L., & Caballero, A. E. (2021). Peer Support Added to Diabetes Education Improves Metabolic Control and Quality of Life in Mayan Adults Living With Type 2 Diabetes: A Randomized Controlled Trial. *Canadian Journal of Diabetes*, *45*(3), 206–213. <https://doi.org/10.1016/j.jcjd.2020.08.107>
- De Groot, J., Wu, D., Flynn, D., Robertson, D., Grant, G., & Sun, J. (2021). Efficacy of telemedicine on glycaemic control in patients with type 2 diabetes: A meta-analysis. *World Journal of Diabetes*, *12*(2), 170–197. <https://doi.org/10.4239/wjd.v12.i2.170>
- Dehesh, T., Dehesh, P., & Shojaei, S. (2020). Prevalence and associated factors of anxiety and depression among patients with type 2 diabetes in Kerman, Southern Iran. *Diabetes Metab Syndr Obes*, *13*. <https://doi.org/10.2147/DMSO.S249385>
- Doherty, A. M., Herrmann-Werner, A., Rowe, A., Brown, J., Weich, S., & Ismail, K. (2021). Feasibility study of real-time online text-based CBT to support self-management for people with type 1 diabetes: the Diabetes On-line Therapy (DOT) Study. *BMJ Open Diabetes Research & Care*, *9*(1). <https://doi.org/10.1136/bmjdr-2020-001934>
- du Pon, E., Kleefstra, N., Cleveringa, F., van Dooren, A., Heerdink, E. R., & van Dulmen, S. (2020). Effects of the Proactive Interdisciplinary Self-Management (PRISMA) Program on Online Care Platform Usage in Patients with Type 2 Diabetes in Primary Care: A Randomized Controlled Trial. *Journal of Diabetes Research*, *2020*, 5013142. <https://doi.org/10.1155/2020/5013142>
- Foti, S. A., Khambaty, T., & Birnbaum-Weitzman, O. (2020). Loneliness, cardiovascular disease, and diabetes prevalence in the Hispanic Community Health Study/Study of Latinos Sociocultural Ancillary Study. *J Immigr Minor Health*, *22*. <https://doi.org/10.1007/s10903-019-00885-7>
- Garcia, S. P., Madalosso, M. M., Bottino, L. G., Monteiro, L. E. R. C., Sparrenberger, K., Schneiders, J., Berlanda, G., Blume, C., Gossenheimer, A. N., Telo, G. H., & Schaan, B. D. (2022). Optimization of Care for Adult Outpatients With Type 2 Diabetes Through the Diabetes Self-Management Multidisciplinary Program: A Randomized Clinical Trial. *Canadian Journal of Diabetes*, *46*(5), 449-456.e3. <https://doi.org/10.1016/j.jcjd.2022.01.006>
- Hurst, C. P., Rakkapao, N., & Hay, K. (2020). Impact of diabetes self-management, diabetes

- management self-efficacy and diabetes knowledge on glycemic control in people with Type 2 Diabetes (T2D): a multi-center study in Thailand. *PLoS ONE*, 15. <https://doi.org/10.1371/journal.pone.0244692>
- JafarBeglu, S., & Mehdad, A. (2020). Effectiveness of self-care training on perceived job stress and perceived self-efficacy among type II diabetic patients. *J Diabetes Nurs*, 8.
- Lawrence, K., Rodriguez, D. V., Feldthouse, D. M., Shelley, D., Yu, J. L., Belli, H. M., Gonzalez, J., Tasneem, S., Fontaine, J., Groom, L. L., Luu, S., Wu, Y., McTigue, K. M., Rockette-Wagner, B., & Mann, D. M. (2021). Effectiveness of an Integrated Engagement Support System to Facilitate Patient Use of Digital Diabetes Prevention Programs: Protocol for a Randomized Controlled Trial. *JMIR Research Protocols*, 10(2), e26750–e26750. <https://doi.org/10.2196/26750>
- Lee, E.-Y., Yun, J.-S., Cha, S.-A., Lim, S.-Y., Lee, J.-H., Ahn, Y.-B., Yoon, K.-H., & Ko, S.-H. (2021). Personalized Type 2 Diabetes Management Using a Mobile Application Integrated with Electronic Medical Records: An Ongoing Randomized Controlled Trial. *International Journal of Environmental Research and Public Health*, 18(10). <https://doi.org/10.3390/ijerph18105300>
- Lee, J. Y., Chan, C. K. Y., Chua, S. S., Ng, C. J., Paraidathathu, T., Lee, K. K. C., & Lee, S. W. H. (2020). Telemonitoring and Team-Based Management of Glycemic Control on People with Type 2 Diabetes: a Cluster-Randomized Controlled Trial. *Journal of General Internal Medicine*, 35(1), 87–94. <https://doi.org/10.1007/s11606-019-05316-9>
- Ong-Artborirak, P., Seangpraw, K., Boonyathee, S., Auttama, N., & Winaiprasert, P. (2023). Health literacy, self-efficacy, self-care behaviors, and glycemic control among older adults with type 2 diabetes mellitus: a cross-sectional study in Thai communities. *BMC Geriatrics*, 23(1), 297. <https://doi.org/10.1186/s12877-023-04010-0>
- Park, S. W., Kim, G., Hwang, Y.-C., Lee, W. J., Park, H., & Kim, J. H. (2020). Validation of the effectiveness of a digital integrated healthcare platform utilizing an AI-based dietary management solution and a real-time continuous glucose monitoring system for diabetes management: a randomized controlled trial. *BMC Medical Informatics and Decision Making*, 20(1), 156. <https://doi.org/10.1186/s12911-020-01179-x>
- Pérez-Aldana, C. A., Lewinski, A. A., Johnson, C. M., Vorderstrasse, A. A., & Myneni, S. (2021). Exchanges in a Virtual Environment for Diabetes Self-Management Education and Support: Social Network Analysis. *JMIR Diabetes*, 6(1), e21611–e21611. <https://doi.org/10.2196/21611>
- Qasim, R., Masih, S., Yousafzai, M. T., Shah, H., Manan, A., Shah, Y., Yaqoob, M., Razzaq, A., Khan, A., & Rohilla, A. R. K. (2020). Diabetes conversation map - a novel tool for diabetes management self-efficacy among type 2 diabetes patients in Pakistan: a randomized controlled trial. *BMC Endocrine Disorders*, 20(1), 88. <https://doi.org/10.1186/s12902-020-00572-x>
- Riihimies, R., Kosunen, E., & Koskela, T. (2020). Web-Based Patient Segmentation in Finnish Primary Care: Protocol for Clinical Validation of the Navigator Service in Patients With Diabetes. *JMIR Research Protocols*, 9(11), e20570–e20570. <https://doi.org/10.2196/20570>
- Rosli, N. A., Mazapuspavina, M. Y., Ismail, Z., & Elkudssiah Ismail, N. (2022). Relationship of Self Efficacy in Medication understanding with Quality of Life among Elderly with type 2 diabetes Mellitus on Polypharmacy in Malaysia. *Int J Environ Res Public Health*, 19. <https://doi.org/10.3390/ijerph19053031>
- Sarteau, A. C., Souris, K. J., Wang, J., Ramadan, A. A., Addala, A., Bowlby, D., Corathers, S., Forsander, G., King, B., Law, J. R., Liu, W., Malik, F., Pihoker, C., Seid, M., Smart,

- C., Sundberg, F., Tandon, N., Yao, M., Headley, T., & Mayer-Davis, E. (2021). Changes to care delivery at nine international pediatric diabetes clinics in response to the COVID-19 global pandemic. *Pediatric Diabetes*, 22(3), 463–468. <https://doi.org/10.1111/pedi.13180>
- Secher, A. L., Pedersen-Bjergaard, U., Svendsen, O. L., Gade-Rasmussen, B., Almdal, T., Raimond, L., Vistisen, D., & Nørgaard, K. (2021). Flash glucose monitoring and automated bolus calculation in type 1 diabetes treated with multiple daily insulin injections: a 26 week randomised, controlled, multicentre trial. *Diabetologia*, 64(12), 2713–2724. <https://doi.org/10.1007/s00125-021-05555-8>
- Shaban, M. M., Sharaa, H. M., Amer, F. G. M., & Shaban, M. (2024). Effect of digital based nursing intervention on knowledge of self-care behaviors and self-efficacy of adult clients with diabetes. *BMC Nursing*, 23(1), 130. <https://doi.org/10.1186/s12912-024-01787-2>
- Sukma Wicaturatmashudi, Pradana Soewondo, Debie Dahlia, Sali Rahadi Asih, Dewi Gayatri, & Ratna Aryani. (2024). Impact of Self-Management on the Quality of Life of Patient with Diabetes Mellitus: A Systematic Review. *Jurnal Promkes*, 12(1), 120–128. <https://doi.org/10.20473/jpk.v12.i1.2024.120-128>
- Wang, X., Tian, B., Zhang, S., Li, J., Yang, W., Gu, L., & Zhang, W. (2023). Underlying mechanisms of diabetes knowledge influencing diabetes self-management behaviors among patients with type II diabetes in rural China: Based on health belief model. *Patient Education and Counseling*, 117, 107986. <https://doi.org/https://doi.org/10.1016/j.pec.2023.107986>
- Wang, Y., Min, J., Khuri, J., Xue, H., Xie, B., A Kaminsky, L., & J Cheskin, L. (2020). Effectiveness of Mobile Health Interventions on Diabetes and Obesity Treatment and Management: Systematic Review of Systematic Reviews. *JMIR MHealth and UHealth*, 8(4), e15400–e15400. <https://doi.org/10.2196/15400>
- Xu, X. Y., Leung, A. Y. M., Chau, P. H., & Literacy, H. (2018). Self-Efficacy, and Associated factors among patients with diabetes. *Health Lit Res Pract Apr*, 2. <https://doi.org/10.3928/24748307-20180313-01>
- Yang, Y., Lee, E. Y., Kim, H.-S., Lee, S.-H., Yoon, K.-H., & Cho, J.-H. (2020). Effect of a Mobile Phone-Based Glucose-Monitoring and Feedback System for Type 2 Diabetes Management in Multiple Primary Care Clinic Settings: Cluster Randomized Controlled Trial. *JMIR MHealth and UHealth*, 8(2), e16266–e16266. <https://doi.org/10.2196/16266>
- Yosep, I., Suryani, S., Mediani, H. S., Mardhiyah, A., & Maulana, I. (2023). Digital Therapy: Alleviating Anxiety and Depression in Adolescent Students During COVID-19 Online Learning - A Scoping Review. *Journal of Multidisciplinary Healthcare*, 16, 1705–1719. <https://doi.org/10.2147/JMDH.S416424>
- Young, H. M., Miyamoto, S., Dharmar, M., & Tang-Feldman, Y. (2020). Nurse Coaching and Mobile Health Compared With Usual Care to Improve Diabetes Self-Efficacy for Persons With Type 2 Diabetes: Randomized Controlled Trial. *JMIR MHealth and UHealth*, 8(3), e16665–e16665. <https://doi.org/10.2196/16665>
- Zhou, Y., Deng, H., Liu, H., Yang, D., Xu, W., Yao, B., Yan, J., & Weng, J. (2020). Effects of novel flash glucose monitoring system on glycaemic control in adult patients with type 1 diabetes mellitus: protocol of a multicentre randomised controlled trial. *BMJ Open*, 10(12), e039400. <https://doi.org/10.1136/bmjopen-2020-039400>