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Improving Self-Care and Self-Efficacy in Type 2 Diabetes Mellitus Patients by Online DSME Educational Videos

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Abstract
Approximately 39.2% of individuals diagnosed with diabetes experience complications. The most common complication reported is diabetic foot, affecting 43.4% of those with complications, followed by nephropathy at 29.5%. Diabetes Self-Management Education (DSME) is essential in type 2 diabetes care, as it equips patients with the skills and confidence needed to manage their condition effectively, thereby reducing complications, enhancing quality of life, and minimising healthcare costs. This study aimed to determine the effect of DSME online educational videos on self-care and self-efficacy of type 2 DM patients. A quasi-experimental study was conducted among 696 diabetic type 2 outpatients from February to March 2023. The patient was selected for purposive sampling from Tamansari Health Center Tasikmalaya Regency. The intervention group (n = 21) received 1 week of online videos about DSME health education in every day. The control group (n = 21) received regular health education in Tamansari Health Centre as care services. Data were collected using The Summary of Diabetes Self-Care Activities (SDSCA) and Diabetes Management Self-Efficacy Scale (DMSES) questionnaires. Data were analysed using paired t-test and independent t-test analysis. There is an effect after being given online DSME educational videos on self-care and self-efficacy of type 2 DM patients with a significance value of self-care and self-efficacy p = 0.000 (p <0.05), it can be concluded that the use of online DSME educational videos affects increasing self-care and self-efficacy of type 2 DM patients.

Keywords: Diabetes Self Management Education, Diabetes Mellitus, Self Care, Self Efficacy.

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1. INTRODUCTION

Diabetes is a chronic condition in which the pancreas fails to produce enough insulin, or the body cannot use insulin properly (International Diabetes Federation, 2021). Diabetes affects 536.6 million people (10.5%) worldwide in 2021, and this figure is anticipated to rise to 783.2 million (12.2%) by 2045. Indonesia ranks fifth in Southeast Asia, with 19.5 million DM cases (International Diabetes Federation, 2021). In the Java-Bali region, which includes West Java, diabetes is approximately 18.27%, making it the highest among the seven areas in Indonesia. By 2045, West Java is projected to have 7,170,569 cases of diabetes, the most significant number of cases (Wahidin et al., 2024). According to the Tasikmalaya Health Office data, the prevalence of diabetes in Tasikmalaya City in 2022 rose. to 7,436 cases (Dinas Kesehatan Kota Tasikmalaya, 2022).

The rise in the number of diabetics can be attributed to population growth, shifts from traditional to modern lifestyles, an increase in obesity, and a lack of physical activity. The high incidence of diabetes can increase the risk of complications, which can be exacerbated if DM patients do not have the means to care for themselves (Sasombo, Katuuk, & Bidjuni, 2021). Diabetes problems might result in financial losses for patients and their families (Windyastuti & Solikhah, 2022). Diabetes patients' issues can be reduced if they have the skills and knowledge to control the condition through self-care and have a high level of self-efficacy (Muazizah, Cahyati, Arsyi, & Wardeni, 2022).

Numerous studies indicate a strong positive correlation between self-efficacy and self-care behaviours associated with better glycemic control. For instance, one study involving 340 T2DM patients found that higher self-efficacy scores correlated with improved self-care behaviours ($r = 0.538$, $P < 0.001$) and lower HbA1c levels ($r = -0.41$, $P < 0.001$) (Tharek et al., 2018). The interplay between self-efficacy, self-care behaviour, and quality of life is also noteworthy. Improved self-efficacy is linked to better quality of life outcomes for patients with T2DM, further reinforcing the need for effective diabetes management strategies that enhance self-efficacy and self-care practices (Saltar, Sahar, & Rekawati, 2023).

To prevent an increased risk of DM complications, health education plays an essential role in managing type 2 DM. The rise of social media platforms and mobile applications has transformed how diabetes education is delivered. Video-based education can now be accessed on-demand, allowing patients to learn at their own pace. Platforms like WhatsApp have been utilised for disseminating educational videos, which have shown positive effects on self-management knowledge among T2DM patients. A study in Banda Aceh demonstrated that educational videos shared via WhatsApp significantly improved patients' self-management knowledge, with pre-test and post-test scores indicating substantial gains (Mulfianda, Keumala, & Riza, 2024). Research comparing traditional DSME methods (like booklets) with video-based education has shown that video methods can lead to better self-care behaviours. One study indicated that using WhatsApp groups for DSME was more effective than conventional lecturing methods, suggesting that interactive and engaging formats may enhance patient learning outcomes (Fitri, Sari, & Krianto, 2019).

DSME is an educational method that contains health education, in which knowledge, skills, and self-care abilities are acquired (Lengga, Mulyati, & Mariam, 2023). Self-care is the ability of individuals, families and communities to maintain and improve health status, prevent disease, and overcome disabilities with or without the support of healthcare providers (Muazizah et al., 2022). To strengthen self-care implementation, one of the DSME components is self-efficacy, which aims to manage DM (Novianti, Indriyawati, & Setyonegoro, 2019). Self-efficacy is an individual's self-confidence in their ability to carry out self-care (Octaviyanti, 2020). Self-efficacy is essential in improving the self-care behaviour of people with DM (Yamin, Sari, & Santoso, 2018). The novelty of this study lies in its innovative use of online educational videos for delivering Diabetes Self-Management Education (DSME) to enhance self-care and self-efficacy in Type 2 Diabetes Mellitus (T2DM) patients. Unlike conventional

DSME, typically conducted through face-to-face sessions, this study employs digital video content accessible through widely used platforms like WhatsApp and YouTube, which allows patients to engage in education at their convenience. This approach not only makes DSME more accessible to patients facing geographical or logistical barriers but also taps into the potential of asynchronous learning to reinforce self-management practices. By rigorously comparing this video-based DSME to traditional lecture-based education, the study demonstrates that digital video interventions can significantly improve self-efficacy and adherence to self-care in diabetes management. This novel approach highlights an adaptable, scalable model for DSME that can be particularly valuable for expanding diabetes care in low-resource settings and provides new insights into the effectiveness of digital tools in chronic disease management. This study aimed to determine the effect of DSME online educational videos on self-care and self-efficacy of type 2 DM patients.

2. RESEARCH METHOD

This study used a quasi-experimental research design with a pretest-posttest and a control group design. This research was conducted at the Mangkubumi Health Center in Tasikmalaya City, West Java. This study involved 42 respondents (4 men and 38 women) with at least elementary education, capable of independent activity, literacy, and verbal communication, and living with or having access to a family member with a cellphone installed with WhatsApp and YouTube. Samples were taken using the purposive sampling method. Next, the sample was divided into two groups. The intervention group consisted of 21 people (4 men and 17 women), and the control group consisted of 21 people (21 women). Type 2 DM patients with physical, mental, or cognitive limitations (severe visual impairment, deafness, mental disability), as well as type 2 DM patients who had complications that could interfere with the study (chronic kidney failure, heart failure, visual impairment, central nervous disorders), were excluded. The instruments used in this study were self-care measurements using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire. The content validity index for the adapted questionnaire was found to be 0.98, indicating excellent agreement among experts regarding its relevance to diabetes care concepts. The internal consistency of the SDSCA was assessed using Cronbach's alpha, which yielded a value of 0.72. This result suggests that the items within the questionnaire reliably measure the same construct related to diabetes self-care activities and self-efficacy measurements using the Diabetes Management Self-Efficacy Scale (DMSES) questionnaire. This study aimed to evaluate the psychometric properties of the Bahasa Indonesia version of SDSCA (Sh et al., 2019). DSME online educational videos that had been validated through expert judgment. Data on respondent characteristics were analysed using the frequency distribution, and self-care and self-efficacy were analysed using central tendency. In contrast, the effectiveness of online DSME educational videos on self-care and self-efficacy was analysed using the Paired t-test. In contrast, the difference in effectiveness between the intervention and control groups used analysis independent sample t-test with a confidence level of 95% ($\alpha = 5\%$).

KEPK Poltekkes Kemenkes Tasikmalaya approved the study protocol. The identifying code for the ethical approval project was DP.04.03/16/104/2023. The entire study process was carried out in conformity with the ethical principles outlined in the 7 (seven) WHO 2011 Standards. Before taking part in the trial, all participants signed informed consent forms.

3. RESULTS AND DISCUSSION

Table 1. Frequency distribution of the characteristics of the respondents

Characteristics Respondents	Frequency (N)	Percentage (%)
Age		
35-45 years	4	9.5
45-55 years	14	33.3
55-65 years	13	31.0
65-75 years	11	26.2
Gender		
Male	4	9.5
Female	38	90.5
Level of education		
Elementary School	26	61.9
Junior High School	6	14.3
Senior High School	9	21.4
College	1	2.4
Type of work		
Labourer	5	11.9
Farmer	2	4.8
Civil servants	1	2.4
Housewives	34	81.0
Long-suffering from DM		
< 5 years	12	28.6
> 5 years	30	71.4

Table 1. The findings showed that most respondents were aged 45-55 years (33.3%), predominantly female (90.5%), with a majority having elementary school education or equivalent (61.9%). Most respondents were housewives (81.0%), and 71.4% reported having had diabetes mellitus for more than five years.

Table 2. Description of pre-test and post-test self-efficacy levels in the intervention group and the control group.

	Group	N	Pretest		Posttest	
			$\bar{x}$ ± Sd	Min - Max	$\bar{x}$ ± Sd	Min - Max
Self-efficacy	Intervention	21	48.62 ± 10,80	24 - 66	78.62 ± 4.975	66 - 85
	Control	21	67.48 ± 14,51	37 - 100	78.10 ± 11.614	55 - 100
Self-care	Intervention	21	30.76 ± 10,40	13 - 53	64.48 ± 14.791	28 - 89
	Control	21	39.14 ± 15,93	15 - 72	60.7 ± 11.574	37 - 77

Table 2 shows the self-care pretest-posttest level in the intervention and control groups. Before receiving the DSME online training film, the intervention group had an average self-care level of 30.76 (sufficient self-care), while the control group had a mean of 39.14 (sufficient self-care). Following the intervention, respondents in the intervention group had a more significant mean increase than the control group, with the intervention group's average level of self-care being 64.48 (excellent self-care) and the control group's average being 60.57 (adequate self-care).

Table 2 also shows the levels of self-efficacy in the intervention and control groups before and after the tests. Before receiving the DSME online educational films, the intervention group had an average self-efficacy level of 48.62 (poor self-efficacy), whereas the average control group was 67.48 (adequate self-efficacy). Following the intervention, respondents in the intervention group saw a more considerable average rise than the control group, with the

intervention group's average level of self-efficacy being 78.62 (excellent self-efficacy) and the control group's average being 78.10.

Table 3. Differences in pre-test and post-test self-care levels and effects in the intervention group and the control group

	Group		**N**	$\bar{x}$ **± Sd**	**p-*value***
Self-care	Intervention	Pre-test	21	30.76 ± 10,406	.000*
		Post-test	21	64.48 ± 14,791	
	Control	Pre-test	21	39.14 ± 15,932	.000*
		Post-test	21	60.57 ± 11,574	
Self-efficacy	Intervention	Pre-test	21	48.62 ± 10,805	.000*
N		Post-test	21	78.62 ± 4,975	
	Control	Pre-test	21	67.48 ± 14,518	.002*
		Post-test	21	78.10 ± 11,614	

N= amount
$\bar{x}$ ± Sd= mean plus min deviation standard

Table 3 shows a significant difference in self-care levels between the intervention and control groups, with a p-value of 0.000 (p <0.05). It is possible to conclude that the intervention and control groups have significantly different levels of self-care before and after the exam. The paired t-test findings revealed a significant difference in self-efficacy levels between the intervention and control groups (p-value = 0.000, p < 0.05). It is possible to conclude that there is a substantial difference in self-efficacy levels between the intervention and control groups before and after the test.

Table 4. Differences in the effect of treatment on the level of self-care and self-efficacy in the intervention group and the control group

Group		**N**	$\bar{x}$	$\Delta\bar{x}$	**p-*value***
Self-care					
Intervention	Pre-test	21	30.76	33.714	.008*
	Post-test	21	64.48		
Control	Pre-test	21	39.14	21.429	
	Post-test	21	60.57		
Self-efficacy					
Intervention	Pre-test	21	48.62	30.000	.000*
	Post-test	21	78.62		
Control	Pre-test	21	67.48	10.619	
	Post-test	21	78.10		

**= p-value < 0.05*

Table 4 shows that self-care has a p-value of 0.008 (p < 0.05), indicating differences in the study results on the self-care levels were average in both the intervention and control groups. According to the table above, the average difference in self-care in the intervention group is 33.714, more significant than the difference in the average self-care in the control group, which is 21.429. This suggests that the intervention group demonstrated a significantly higher improvement in self-care (mean score: 33.714) compared to the control group (mean score: 21.429), indicating the effectiveness of the intervention in enhancing self-care practices among participants.

Table 4 indicates that the self-efficacy data has a p-value of 0.000 (p < 0.05). The average examination of self-efficacy levels in the intervention and control groups yielded different

results. According to the table above, the intervention group had an average difference in self-efficacy of 30,000, which is 30,000 greater than the control group's average difference of 10,619. The independent t-test revealed a significant difference in effectiveness between providing online DSME educational videos on self-care and self-efficacy to type 2 DM patients in the intervention group (p-value < 0.05) with health education lecture method in the control group.

DISCUSSION

Integrating Diabetes Self-Management Education (DSME) into diabetes care has significantly improved self-efficacy and self-care activities among patients with Type 2 Diabetes Mellitus (T2DM). Here's an exploration of how DSME enhances self-efficacy and improves self-care activities, supported by previous research findings.

The study showed that before being given the DSME online educational video, most respondents in the intervention and control groups had low self-efficacy in maintaining eating patterns outside the home and sufficient self-efficacy in taking medication regularly. Researchers in the field found that most respondents said they were unsure about maintaining their diet outside the house, especially at celebrations, because most respondents were complacent about all types of food available without paying attention to the diet that must be followed. Disobedience to following a diet can cause poor blood sugar levels, which can cause metabolic instability and body hemodynamics (Yaqin, Niken, & Dharmana, 2017). Setyorini (2017) states that most type 2 DM patients violate dietary restrictions or recommendations because of dietary disobedience during holiday celebrations and because they like the food or drink. After being given the online DSME educational video, there was an increase in the mean self-efficacy level in the intervention and control groups. Self-efficacy is an individual's self-confidence in their ability to carry out self-care (Octaviyanti, 2020). Self-efficacy is essential in improving the self-care behaviour of people with DM (Yamin, Sari & Santoso, 2018).

The results showed a significant difference in the effect on the level of self-care and self-efficacy between the intervention group and the control group. Even though they were statistically the same, in substance, it showed that the effectiveness of giving online DSME educational videos to the intervention group was more significant than providing health education using the lecture method to the control group. The provision of online DSME educational videos shows that it can improve and can be a solution to enhance self-care abilities and self-efficacy in type 2 DM patients. Implementing health education through the lecture method only occurs during one meeting. So, this is thought to be the cause of the mean pre-test and post-test scores in the control group having a lower proportion. Nurjannah (2022) stated that health education using the lecture method was less effective in increasing the self-care of type 2 DM patients.

Diabetes Self-Management Education (DSME) has positively impacted patients with Diabetes Mellitus (DM), particularly in low-resource settings. Recent studies have highlighted the effectiveness of DSME interventions in improving diabetes control, care, and quality of life among patients with DM. A mixed-methods study by Roberta et al. (2023) found that DSME interventions improved self-management practices among patients with DM in low-resource settings. A systematic review and meta-analysis by Karki et al. (2023) showed that health behaviour interventions, including DSME, improved the quality of life among patients with type 2 diabetes in low- and middle-income countries. The effectiveness of DSME interventions may be influenced by factors such as the patient's behavioural change stage, as demonstrated by Bouchi et al. (2023), and the tailoring of interventions to specific populations, as highlighted by Camargo-Plazas et al. (2023) in their scoping review of DSME interventions for older persons in Western countries. DSME empowers patients by addressing both practical and psychological aspects of diabetes care, strengthening their confidence in managing their health. This boost in self-efficacy largely stems from DSME's targeted educational approach, which

focuses on essential skills like blood glucose monitoring, dietary planning, and medication adherence (Sharma, Feldman, & Sharma, 2024).

Moreover, incorporating specific frameworks, such as the AADE7 Self-Care Behaviors Framework, into DSME approaches has improved diabetes education management in a shared care model (Liu & Liu, 2024). As research continues to explore novel DSME approaches, such as community leader-driven, kit-based interventions (Nagpal et al., 2023), the potential for DSME to positively impact the lives of patients with DM across various settings becomes increasingly evident. In addition, another study (Behuku, Alfianto, & Amalia, 2023) states that generation Z of the Melanesian race, including Indonesia, focuses on positive physical and behavioural health.

DSME has a well-documented ability to enhance self-efficacy, empowering patients with a stronger sense of control and competence in managing their condition while significantly boosting self-care activities. Through in-depth education about diabetes mechanisms and the impact of personal habits, DSME helps patients build a comprehensive understanding of their condition, which is essential for self-efficacy. Research indicates that as patients increase their knowledge, they experience a proportional increase in confidence to manage their condition independently (Marbun et al., 2021; Munir, Munir, & Syahrul, 2019; Tharek et al., 2018). The DSME framework also incorporates goal-setting and problem-solving as core elements, further enhancing self-efficacy. When patients are encouraged to set realistic, actionable goals, they gain a sense of accomplishment and a reinforced belief in their ability to influence their health outcomes actively. This goal-setting process, essential to DSME, allows short-term victories and long-term motivation, fostering a cycle of self-confidence and proactive engagement with diabetes management. Studies highlight that DSME's structured approach to education and personal empowerment consistently promotes higher levels of self-efficacy among participants (Kiçaj et al., 2024).

Moreover, including peer support sessions within DSME fosters a supportive environment vital for patients navigating the complexities of diabetes care. Sharing experiences and strategies with peers cultivates a sense of community and normalises the challenges patients face, which has been shown to reinforce self-efficacy further. Patients who participate in these group interactions report feeling validated and motivated, recognising they are not alone. This social component has been shown to encourage adherence to self-care routines and bolster the confidence needed to maintain these practices over time (Anggoniawan, 2018; Tharek et al., 2018).

The advent of online DSME has taken the effectiveness of these programs a step further by making education more accessible and adaptable to the diverse needs of patients. With online DSME, patients can access educational resources, peer discussions, and even provider feedback anytime, removing barriers like travel limitations or rigid schedules. This flexibility significantly enhances participation rates and sustains engagement, as patients can learn at their own pace and revisit content as needed. Research supports that online platforms can substantially increase accessibility, especially for patients in remote or underserved areas, thereby broadening DSME's reach and impact (Chowdhury et al., 2024)

Furthermore, online DSME platforms often provide a channel for continuous support and real-time feedback, allowing healthcare providers to monitor patients' progress and offer timely guidance. This ongoing communication empowers patients to adjust their self-care routines immediately and strengthens their commitment to diabetes management. Continuous, accessible support has been linked to higher adherence rates in self-care activities, illustrating the added value of an online platform in maintaining patients' motivation and accountability (Chowdhury et al., 2024).

4. CONCLUSION

This study showed a significant increase in self-care and self-efficacy in type 2 DM patients after receiving online DSME educational videos in the intervention group. Online DSME educational videos have proven more effective in increasing self-care and self-efficacy in type 2 DM patients. As the closest healthcare facility provider, the community primary health care (puskesmas) should facilitate educational materials on DM self-care management using educational videos to prevent complications and increase DM prevalence. To avoid complications, type 2 DM patients must increase their knowledge and skills regarding DM self-care management. The study's focus on comparing online video-based DSME to standard lecture-based health education is also innovative, as it provides empirical evidence on the effectiveness of digital tools in diabetes management. The finding that online DSME videos have a statistically significant positive impact on self-efficacy and self-care behaviours adds valuable insights to the literature, particularly regarding T2DM management in community healthcare settings. Furthermore, this approach is likely one of the few studies examining the impact of DSME delivered entirely through an asynchronous video format, making it an original contribution to digital health education research.

REFERENCES

Anggoniawan, M. S. (2018). Hubungan Dukungan Keluarga Dengan Self Care Pada Pasien Stroke Non Hemoragik (Di Ruang Flamboyan Rumah Sakit Umum Jombang). *Skripsi*, STIKES Insan Cendekia Medika Jombang. Retrieved from: https://repository.itskesicme.ac.id/id/eprint/1332/

Behuku, F. M., Alfianto, A. G., & Amalia, W. (2023). Self Care of Mental Health Generation Z Of Melanesia Race In Indonesia. *Journal of Rural Community Nursing Practice*, *1*(1), 89–101. https://doi.org/10.58545/jrcnp.v1i1.92

Bouchi, R., Noda, M., Hayashino, Y., Goto, A., Yamazaki, K., Suzuki, H., … Kobayashi, M. (2023). Behavioural change stage might moderate the impact of multifaceted interventions on non-attendance from medical care among patients with type 2 diabetes: The Japan Diabetes Outcome Intervention Trial-2 Large-Scale Trial 007 (J-DOIT2-LT007). *Journal of Diabetes Investigation*, *14*(7), 907–916. https://doi.org/10.1111/jdi.14012

Camargo-Plazas, P., Robertson, M., Alvarado, B., Paré, G. C., Costa, I. G., & Duhn, L. (2023). Diabetes self-management education (DSME) for older persons in Western countries: A scoping review. *PloS one*, 18(8), e0288797. https://doi.org/10.1371/journal.pone.0288797

Chowdhury, H. A., Harrison, C. L., Siddiquea, B. N., Tissera, S., Afroz, A., Ali, L., … Billah, B. (2024). The effectiveness of diabetes self-management education intervention on glycaemic control and cardiometabolic risk in adults with type 2 diabetes in low- and middle-income countries: A systematic review and meta-analysis. *Plos One*, *19*(2), e0297328. https://doi.org/10.1371/journal.pone.0297328

Dinas Kesehatan Kota Tasikmalaya. (2022). *Jumlah Penderita Diabetes Mellitus Tahun 2021*. Dinas Kesehatan Kota Tasikmalaya. Retrieved from: https://data.tasikmalayakota.go.id/home/dinas-kesehatan/jumlah-penderita-diabetes-melitus-tahun-2021/

Fitri, D. E., Sari, S. M., & Krianto, T. (2019). Perbandingan Diabetes Self Management Education Metode Ceramah Menggunakan Booklet dengan Metode Group Whatsapp terhadap Self Care Behavior Pasien Diabetes Mellitus. *Jurnal Kesehatan Komunitas*, *4*(3), 126–131. https://doi.org/10.25311/keskom.Vol4.Iss3.294

International Diabetes Federation. (2021). IDF diabetes atlas 10th edition. In *Diabetes Research and Clinical Practice*.

Karki, A., Vandelanotte, C., Khalesi, S., Dahal, P., & Rawal, L. B. (2023). The effect of health

behavior interventions to manage Type 2 diabetes on the quality of life in low-and middle-income countries: A systematic review and meta-analysis. *Plos one*, 18(10), e0293028. https://doi.org/10.1371/journal.pone.0293028

Kiçaj, E., Saliaj, A., Çerçizaj, R., Prifti, V., Qirko, S., & Rogozea, L. (2024). Navigating Diabetes: Enhancing Self-Management through Education among Diabetic People at the Early Stages of the Disease—A Systematic Review. *International Journal of Environmental Research and Public Health*, *21*(5), 522. https://doi.org/10.3390/ijerph21050522

Lengga, V. M., Mulyati, T., & Mariam, S. R. (2023). Pengaruh diabetes self management education (DSME) terhadap tingkat pengetahuan penyakit diabetes melitus pada pasien diabetes melitus. *Jurnal Penelitian Perawat Profesional*, *5*(1), 103–112.

Liu, Y., & Liu, C. (2024). Effect of the AADE7 Self-Care Behaviors Framework on Diabetes Education Management in a Shared Care Model. International Journal of Endocrinology, 2024(1), 7278207. https://doi.org/10.1155/2024/7278207

Marbun, A. S., Siregar, R., Harefa, K., & Sinabutar, T. Y. F. (2021). Pengaruh diabetes self management education (DSME) berbasis aplikasi whatsapp terhadap self efficacy pada pasien DM tipe 2 di Puskesmas Hamparan Perak. *Jurnal Mutiara Ners*, *4*(2), 128–139.

Muazizah, Y. N., Cahyati, Y., Arsyi, N., & Wardeni, R. (2022). *Meningkatkan kualitas hidup pasien diabetes melitus melalui self care management*. *13*(Khusus), 8–14.

Mulfianda, R., Keumala, A., & Riza, S. (2024). Efektivitas Pemanfaatan Video Edukasi melalui Whatsaap terhadap Manajemen Diri pada Pasien Diabetes Mellitus Tipe 2 di Kota Banda Aceh. *MAHESA : Malahayati Health Student Journal*, *4*(5), 1777–1784. https://doi.org/10.33024/mahesa.v4i5.14336

Munir, N. W., Munir, N. F., & Syahrul. (2019). Self-efficacy dan kualitas hidup pasien diabetes melitus tipe 2. *Jurnal Penelitian Kesehatan Suara Forikes*, *11*(2), 147–149.

Nagpal, J., Rawat, S., Gupta, L., Negi, A., & Oraon, D. S. (2023). A stepped wedge cluster randomised trial to evaluate the effectiveness of a community leader-driven kit-based diabetes self-management education approach in improving diabetes control and care: study protocol for the Delhi Diabetes INTervention Trial (DED. *Trials*, *24*(1), 1–12. https://doi.org/10.1186/s13063-023-07712-3

Novianti, D., Indriyawati, N., & Setyonegoro, S. A. (2019). Efektivitas diabetes self-management education dan community-based interactive approach terhadap self-care penderita diabetes mellitus. *Jendela Nursing Journal*, *3*(1), 1–10. https://doi.org/10.31983/jnj.v3i1.4453

Nurjannah, A. (2022). Pengaruh diabetes self management education (DSME) melalui whatsapp di masa pandemi covid-19 terhadap self care pasien dm tipe 2 di puskesmas sayegan. *Skripsi*, Poltekkes Kemenkes Yogyakarta.

Octaviyanti, D. P. F. (2020). Literature review: pengaruh edukasi self management diabetes terhadap self-efficacy pada penderita diabetes Mmllitus. *Jurnal Genta Kebidanan*, *10*(1), 12–21. https://doi.org/10.36049/jgk.v10i1.20

Roberta, L., Amoakoh-Coleman, M., Djobalar, B., Grobbee, D. E., Adjei, G. O., & Klipstein-Grobusch, K. (2023). Diabetes self-management education interventions and self-management in low resource settings; a mixed methods study. *PLoS ONE*, *18*(7 July), 1–20. https://doi.org/10.1371/journal.pone.0286974

Saltar, L., Sahar, J., & Rekawati, E. (2023). Self-Care Behavior, Self-Efficacy and Quality of Life of Patients with Type 2 Diabetes Mellitus with Symptoms of Peripheral Neuropathy. *Journal for ReAttach Therapy and Developmental Diversities*, 6(9s), 799-809. Retrieved from: https://jrtdd.com/index.php/journal/article/view/1642

Sasombo, A., Katuuk, M. E., & Bidjuni, H. (2021). Hubungan self care dengan komplikasi diabetes melitus pada pasien dengan diabetes melitus tipe 2 di klinik Husada Sario

Manado. *Jurnal Keperawatan*, 9(2), 54-62.

Setyorini, A. (2017). Stres dan Koping pada pasien dengan DM tipe 2 dalam pelaksanaan manajemen diet di wilayah Puskesmas Banguntapan II Kabupaten Bantul. *Health Sciences and Pharmacy Journal*, 1(1), 1-9. https://doi.org/10.32504/hspj.v1i1.3

Sh, S., Hsu, Y. Y., Toobert, D. J., & Wang, S. T. (2019). The validity and reliability of the summary of diabetes self-care activities questionnaire: an Indonesian version. *Indonesian Nursing Journal of Education and Clinic (INJEC)*, 4(1), 25-36. https://doi.org/10.24990/injec.v4i1.229

Sharma, V., Feldman, M., & Sharma, R. (2024). Telehealth Technologies in Diabetes Self-management and Education. *Journal of Diabetes Science and Technology*, *18*(1), 148–158. https://doi.org/10.1177/19322968221093078

Tharek, Z., Ramli, A. S., Whitford, D. L., Ismail, Z., Mohd Zulkifli, M., Ahmad Sharoni, S. K., … Jayaraman, T. (2018). Relationship between self-efficacy, self-care behaviour and glycaemic control among patients with type 2 diabetes mellitus in the Malaysian primary care setting. *BMC Family Practice*, *19*(1), 39. https://doi.org/10.1186/s12875-018-0725-6

Wahidin, M., Achadi, A., Besral, B., Kosen, S., Nadjib, M., Nurwahyuni, A., … Kusuma, D. (2024). Projection of diabetes morbidity and mortality till 2045 in Indonesia based on risk factors and NCD prevention and control programs. *Scientific Reports*, *14*(1), 5424. https://doi.org/10.1038/s41598-024-54563-2

Windyastuti, E., & Solikhah, M. M. (2022). Pengaruh pendidikan kesehatan berbasis keluarga terhadap self-care managent diabetes mellitus di Posbindu Lansia Sakura Kelurahan Pelsungan Kabupaten Karanganyar. *Jurnal Kesehatan Kusuma Husada*, 211–220. https://doi.org/10.34035/jk.v13i2.856

Yamin, A., Sari, C. W. M., & Santoso, M. B. (2018). Hubungan self management dan self-efficacy pada pasien diabetes melitus di kota bandung. *Jurnal Keperawatan BSI*, *6*(1), 64–68. Retrieved from: https://ejournal.bsi.ac.id/ejurnal/index.php/jk/article/view/3694

Yaqin, A., Niken, S., & Dharmana, E. (2017). Efek self efficacy training terhadap self efficacy dan kepatuhan diet diabetesi. *JI-KES (Jurnal Ilmu Kesehatan)*, *1*(1),1-10. https://doi.org/10.33006/ji-kes.v1i1.45