

EFFECT OF FAMILY CAREGIVER EMPOWERMENT ON BURNOUT IN CAREGIVER TYPE 2 DIABETES

Novita Putri Eka Wardani, Rondhianto, Akhmad Zainur Ridla
Faculty of Nursing, University of Jember, Jember, Indonesia
email: rondhianto@unej.ac.id

Abstrak

Burnout pada caregiver dapat muncul sebagai reaksi dari peran, tanggung jawab, dan kurang optimalnya caregiver keluarga dalam merawat penderita T2DM. Burnout yang terjadi mengindikasikan kurangnya sumber daya dalam penatalaksanaan T2DM yang menyebabkan kemampuan keluarga tidak memadai. Penelitian ini bertujuan untuk menganalisis pengaruh intervensi Family Caregiver Empowerment Model (FCEM) terhadap Burnout pada Caregiver pasien Diabetes Melitus tipe 2. Penelitian ini merupakan penelitian quasi eksperimental dengan desain pretest dan posttest dengan sampel sebanyak 74 responden, secara acak menggunakan cluster sampling (perlakuan = 35, kontrol = 39). Variabel independen adalah FCEM, dan variabel dependen adalah burnout. Instrumen yang digunakan adalah kuesioner Maslach Burnout Inventory (MBI-HSS). Analisis statistik menggunakan Wilcoxon signed rank test dan Mann Whitney. Hasil penelitian menunjukkan bahwa pada kelompok intervensi dan kelompok kontrol terdapat perbedaan skor burnout yang signifikan pada saat pretest dan posttest ($p < 0.001$ $p = 0.002 < \alpha = 0.05$). Terdapat perbedaan yang signifikan pada skor burnout antara kelompok intervensi dan kelompok kontrol ($p < 0,001$). Intervensi FCEM dapat mengurangi depresi pada penderita T2DM. Perawat dapat menggunakan intervensi FCEM untuk meningkatkan kapasitas keluarga dalam perawatan diri diabetes untuk mengurangi burnout pada caregiver pasien T2DM.

Kata kunci: burnout, pemberdayaan, pengasuh keluarga, diabetes mellitus tipe 2

Abstract

Burnout in caregivers can arise as a reaction to the role, responsibility, and less-than-optimal family caregivers in caring for people with T2DM. Burnout may indicate a lack of resources in managing T2DM, which can result in inadequate family abilities. This study aims to analyze the effect of the Family Caregiver Empowerment Model (FCEM) intervention on Burnout in Caregivers of type 2 Diabetes Mellitus patients. The study was a quasi-experimental pretest and posttest design with a sample of 74 respondents, randomly using cluster sampling (treatment = 35, control = 39). The independent variable is FCEM, and the dependent variable is burnout. The instrument used was the Maslach Burnout Inventory (MBI-HSS) questionnaire. Statistical analysis used Wilcoxon signed rank test and Mann Whitney. The results showed that in both the intervention and control groups, there was a significant difference in burnout scores at the pretest and posttest ($p < 0.001$ $p = 0.002 < \alpha = 0.05$). There was a significant difference in burnout scores between the intervention and control groups ($p < 0,001$). FCEM intervention could reduce depression in people with T2DM. Nurses can use FCEM interventions to increase family capacity in diabetes self-care and reduce burnout in caregivers of patients with T2DM.

Keywords: burnout, empowerment, family caregiver, type 2 diabetes mellitus

1. INTRODUCTION

Diabetes mellitus is a chronic health problem (Alsaedi et al., 2022; Ansari et al., 2022). According to the International Diabetes Federation, in 2021, 537 million adults in the world have diabetes, with 90% of them having Type 2 Diabetes Mellitus (T2DM), and this is expected to continue to increase to 783

million by 2045. (International Diabetes Federation, 2021). People with diabetes must always control their food, sugar consumption, and lifestyle (Ansari et al., 2022; Lambrinou et al., 2019) and manage stress (Wahyuningrum et al., 2020). Patients and families play an important role in maintaining lifestyle changes and diabetes

management (Thongduang et al., 2022). The caregiver's responsibility to care for the patient creates stress (Swartz & Collins, 2019). This increase in stress is the cause of burnout in caregivers (Nagori, 2023).

Family caregivers have an important role in the ongoing care process of chronic patients (Swartz & Collins, 2019; Teti Rahmawati, 2019). Research shows that family caregivers provide 90% of care for people with chronic diseases. They are vital in patients' lives (Swartz & Collins, 2019). In addition to assisting patients in their daily activities, caregivers also have the task of helping to obtain health services, reminding them to take medication regularly, and regulating their diet according to their diet (Teti Rahmawati, 2019; Thongduang et al., 2022). These roles and obligations trigger caregiver stress (Nagori, 2023), which is persistent, uncontrollable, and unpredictable (Swartz & Collins, 2019). Negative changes in caregiver psychology in the form of chronic stress make caregivers vulnerable to burnout (Nagori, 2023). The results of research by Swartz et al., 2019 show that caregivers who experience burnout are most likely to have low levels of education, live with sufferers, and provide care for more than 21 hours per week (Swartz & Collins, 2019). Burnout in caregivers has an impact on the mental health condition of the caregiver and leads to not maximizing the care provided by the caregiver to the patient (Maharani et al., 2023).

Previous studies have shown caregivers with chronic illness to have Emotional Fatigue scores of 22.21, Self-depersonalization of 6.40, and Decreased achievement of 13.24 (Ahmadi, 2021). Another study also showed that caregivers of people with DM had Emotional Fatigue scores of 9.15, Self-depersonalization: 5, and Decreased achievement of 27.21 (Nagori, 2023). A semi-structured interview was conducted as a preliminary study to explore the experiences of caregivers in providing care for patients with type 2 diabetes mellitus. The results of a preliminary study conducted on 10 caregivers showed that 6 out of 10 caregivers said they felt tired after caring for the patient, 5 out of 10 caregivers said they felt happy after successfully caring for the patient, 3 out of 10 caregivers said they sometimes felt frustrated because they had to constantly care for the patient, 3 out of 10

caregivers said they sometimes ignored the patient due to fatigue with their work, and 4 out of 10 caregivers said that caring for family members with T2DM was not a burden, but an obligation as a family.

The role of the family as a family caregiver must be strengthened through appropriate educational strategies, providing access to the resources needed, and a supportive environment (Rondhianto et al., 2020). One of the efforts that can be made to improve family self-management with Type 2 Diabetes Mellitus is to use the family caregiver empowerment model. This empowerment model is one of the nursing intervention efforts with a non-pharmacological approach that is applied educationally through training and mentoring to families caring for family members with T2DM conditions in proper management. This family empowerment model teaches families to be proficient in maintaining the health status of people with T2DM, starting from their anthropometric status, blood glucose, and physical fitness. This family empowerment model can provide an understanding of T2DM self-management in minimizing the emergence of disease complications such as disability, decreased quality of life, and death (Rondhianto et al., 2020; 2021). Family caregiver empowerment can provide positive control, foster a positive attitude, try to understand one's role as a caregiver to improve proactive caregiving skills, support the independence of care recipients, and create constructive relationships with others (Rondhianto et al., 2020). This study was conducted to prove whether the Family Caregiver Empowerment Model influences burnout in caregivers of patients with Type 2 diabetes.

2. RESEARCH METHOD

This quantitative research has a quasi-experiment design with pretest and posttests conducted at Summersari Health Center. Cluster sampling was used to capture family caregiver participants in five Summersari Health Center working area villages. Data collection was conducted from 1 March to 16 June 2024. The sample inclusion criteria were family caregivers of patients with T2DM; there was only one person with T2DM in the family, living with the family, willing to become research respondents; aged 18-65 years; families with large family

types; no family suffering from other chronic diseases; residing in the Summersari Puskesmas working area; and having a telephone to communicate.

Meanwhile, the exclusion criteria were family caregivers of patients with T2DM who were caring for patients with T2DM hospitalized in healthcare facilities and had physical limitations and barriers to communication, such as deafness, speech impairment, and visual impairment. Sample size was counted using GPower application with an effect size of 0.8, determined and significance level of 0.05 was applied based on Cohen's guidelines (Cohen, 2018).

This study adopted a power of 0.9, resulting in a total sample size of 68, which was increased by 10% to account for potential respondent dropout before or during the study, bringing the total sample size to 78 and it was divided equally for intervention and control groups. During the research process, 4 respondents dropped out for various reasons, including 2 individuals who were hospitalized, 1 respondent who faced scheduling difficulties, and 1 individual who passed away. The final number which then analysed comprised 74 respondents, consisting of 35 intervention group respondents and 39 control group respondents. The drop out of four participants from the intervention group due to were 4 participants from intervention group drop out due to family business and time constraints. However, according to the power analysis conducted using the G*Power application, the 74 sample size in this study achieves an effect size of 0.8 and a statistical power of 0.9, which is sufficient to produce generalizable results.

The independent variable in this study was the Family Caregiver Empowerment Model (FCEM) intervention, and the dependent variable was burnout. The FCEM intervention was developed based on the researcher's independent study, integrating evidence-based concepts on managing burnout among caregivers of patients with type 2 diabetes mellitus (Rondhianto et al, 2020). This model was designed to empower caregivers through interventions proven to reduce stress, enhance coping capacity, and support their role in the care of T2DM patients. The intervention included education, training, and mentoring in 10 ten-week sessions.

Sessions 1 through 6 provided education and training with home visits for \pm 120 minutes per session, followed by the seventh session, which is mentoring in the form of evals and monitoring with a home visit of \pm 120 minutes. Sessions 8-10 were accompanied via telephone for \pm 60 minutes. Table 1 provides a more concise overview of the FCEM sessions. Meanwhile, the control group continued with standard care which is monthly meeting in Community Non-communicable program (Posbindu PTM) run by Public Health Centre. In this study, researchers used the Indonesian version of the Maslach Burnout Inventory-HSS questionnaire. The questionnaire has been tested for validity and reliability with $r = 0.440-0.8122$ results and Cronbach alpha = 0.916 (Widhianingtanti, 2022). The MBI-HSS consists of 22 items in the form of seven Likert scales: (0) never, (1) several times a year or less, (2) once a month or less, (3) several times a month, (4) once a week, (5) several times a week, (6) every day. This questionnaire consists of three indicators: emotional exhaustion, depersonalization, and decreased self-achievement (Li-Sauwirne, 2020). The total burnout score is then categorized into three categories: high, moderate, and low. The total burnout score is calculated by summing up all question items, which are 22 items. Categorizing the total score using a three-level score categorization refers to the categorization norm (Azwar, 2022). Posttest (MBI-HSS) was given after one week after the last intervention.

Data collection was conducted through interviews (door-to-door) with respondents. Before data collection, researchers explained the purpose, benefits, procedures and possible risks to potential respondents. Respondents who understood and expressed their agreement to participate in the study were asked to sign a consent form. Data collection was carried out twice, namely during pretest and posttest. Researchers took the pretest before the intervention and the post-test one week after the last intervention. This research was approved and declared ethically feasible by the Health Research Ethics Committee of the Faculty of Nursing, University of Jember, with Number 157/UN25.1.14/KEPK/2024.

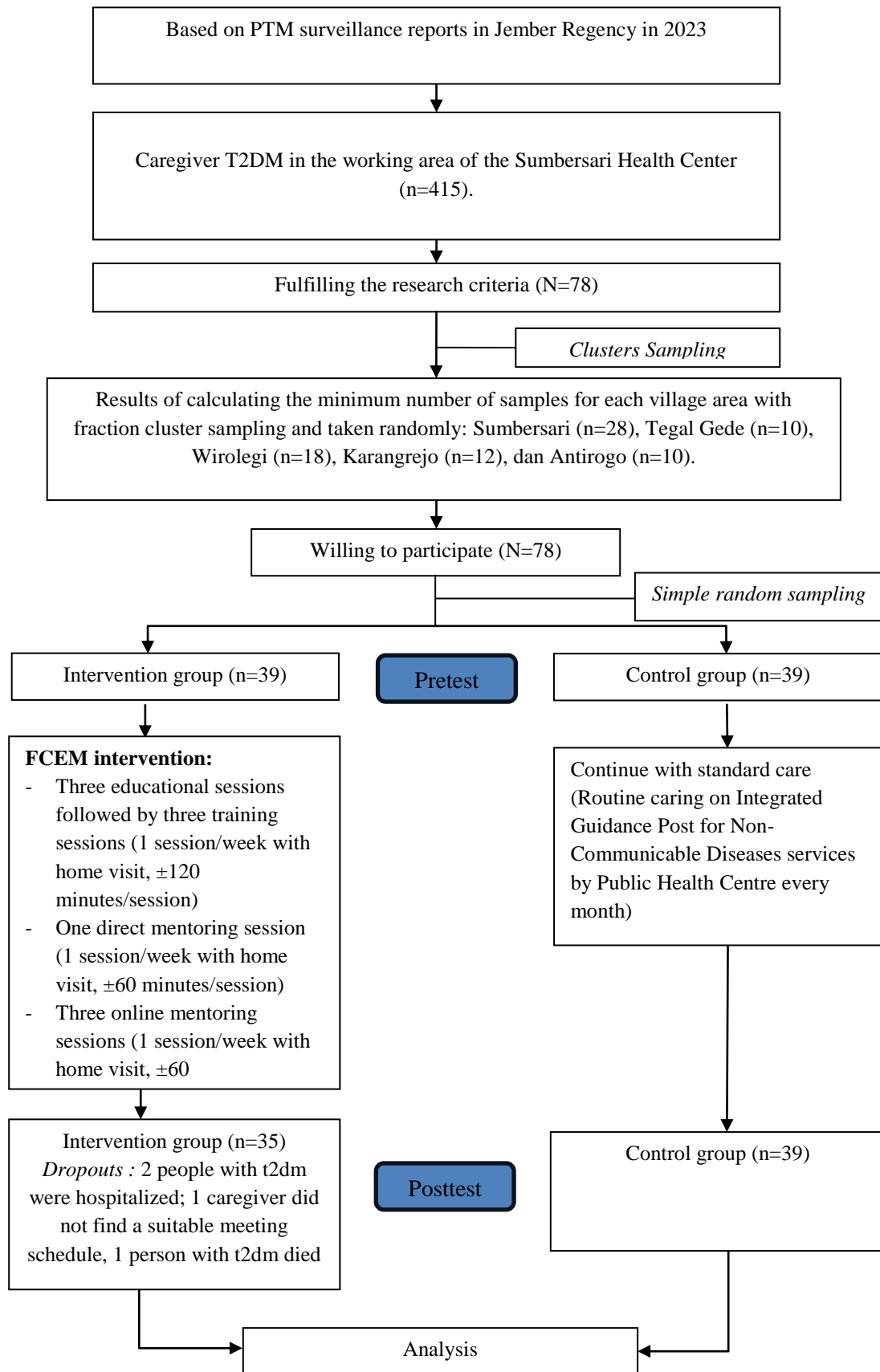


Figure 1. Flowchart procedure

3. RESULT AND DISCUSSION

The results of this study are presented in several tables, namely the respondent characteristics

table, the group average difference table, the Wilcoxon test results table and the Mann-Whitney test results table.

Table 1. Characteristics of respondents

Characteristics	N (%)	Burnout				Median±Min-Max (95% CI)	Kruskal Wallis
		Low	Medium	High			
Age							
12-20 years old	0	0	0	0	-	0.330	
20-40 years old	19	2	17	0	2.00±2-3 (1.95-2.26)		
40-65 years old	54	14	40	0	2.00±2-3(2.14-2.38)		
> 65 years old	1	0	1	0	-		
Total	74	16	67	0	-		
Gender							
Male	18	2	16	0	2.00±2-3 (1.95-2.27)	0.216	
Female	56	14	42	0	2.00±2-3 (2.13-2.37)		
Total	74	16	58	0			
Education							
No education	2	0	2	0	2.00±2-3 (2.0-2.0)	0.652	
Elementary school	21	4	17	0	2.00±2-3 (2.01-2.37)		
Junior high school	16	2	14	0	2.00±2-3 (1.94-2.31)		
Senior high school	27	8	19	0	2.00±2-3 (2.11-2.48)		
College	8	2	6	0	2.00±2-3 (1.86-2.64)		
Total	74	16	58	0			
Occupation							
Unemployed	1	0	1	0		0.634	
Civil servants	2	0	2	0	2.00±2-2 (2.0-2.0)		
Army personel/Police	0	0	0	0	-		
Laborer	6	0	6	0	2.00±2-2 (2.0-2.0)		
Teacher	4	1	3	0	2.00±2-3 (1.45-3.05)		
Farmer	0	0	0	0	-		
Self employed	13	2	11	0	2.00±2-3 (1.93-2.38)		
Housewife	37	9	28	0	2.00±2-3 (2.10-2,39)		
Etc	11	4	7	0	2.00±2-3 (2.02-2.70)		
Total	74	16	58	0	-		
Income							
Below RMW	63	10	53	0	2.00±2-3 (2.07-2.25)	0.004	
Above RMW	11	6	5	0	3.00±2-3 (2.19-2,90)		
Total	74	16	58	0	-		
Status marital							
Married	72	16	56	0	2.00±2-3 (2.12-2.32)	0.455	
Widower	0	0	0	0	-		
Not married	2	0	2	0	2.00±2-2 (2.0-2.0)		
Total	74	16	58	0			
Relationship with patient							
Child	24	5	19	0	2.00±2-3 (2.03-2.38)	0.623	
Husband	13	2	11	0	2.00±2-3 (1.93-2.38)		
Wife	26	8	18	0	2.00±2-3 (2.12-2.50)		
Family other	3	0	3	0	2.00±2-2 (2.0-2.0)		
Son/daughter in law	4	1	3	0	2.00±2-3 (1.45-3.05)		
Grandchild	4	0	4	0	2.00±2-2 (2.0-2.0)		
Total	74	16	58	0			
Length of time caring for the patient							
< 5 years	48	8	40	0	2.00±2-3 (2.06-2.28)	0.162	
≥ 5 years	26	8	18	0	2.00±2-3 (2.12-2.50)		
Total	74	16	58	0			
Complications of the patient							
Yes	24	7	17	0	2.00±2-3 (2.06-2.28)	0.278	
No	50	9	41	0	2.00±2-3 (2.12-2.50)		
Total	74	16	58	0	-		

Most respondents aged 40-65 years tend to experience moderate burnout. The p-value of 0.330 indicates no difference in burnout between the two groups aged 40-65 years. In this age range, a person encounters many challenges and changes, both physically, psychologically, socially, and economically (Hakim, 2020). According to Erikson's psychosocial development theory, at this stage, a person will be faced with the main task of being productive in their field of work and the demands of successfully educating their family and training the next generation (Fauzian, 2020). The role and obligations of a caregiver trigger negative changes in the caregiver's psychology in the form of chronic stress, which makes the caregiver vulnerable to burnout (Nagori, 2023). Female respondents tend to experience moderate burnout. The p-value of 0.216 indicates no difference in burnout between the two groups. The culture of Indonesian society places women in household affairs, namely, caring for healthy and sick family members (Anto, 2023). Respondents with the latest senior high school education tend to experience moderate burnout, and there is no difference in burnout between the two groups. Individuals with a high school education can receive information or knowledge that can lead to a positive attitude in dealing with sick families (Ariska et al., 2020). The level of education can also reflect economic status and insight into health (Soewondo, 2021). Respondents working as housewives tend to experience moderate burnout, and the two groups have no difference in burnout. Housewife means that someone spends most of their time at home. It is considered more able to allocate time for sufferers because

family caregivers must have flexibility and adaptability for the successful holistic functioning of the family (Luthfa, 2018). Respondents with income below the minimum wage tend to experience moderate burnout. The p-value of 0.004 indicates a difference in burnout between the two groups.

Low income can cause family functioning to be problematic because insecure financial conditions are closely related to the ability to solve problems and hinder cohesion in the family (Banovcinova et al., 2014). Low income affects the needs of families with sick family members who require routine control from the doctor (Asih, 2021). Respondents who are married and are wives of sufferers tend to experience moderate burnout. Married family caregivers have multiple responsibilities (Natumnea, 2020). In this case, the family function will run optimally if the family role is balanced (Herawati, 2020). The roles and duties of wives are also influenced by the culture that places women in caring for sick family members (Anto, 2023). Respondents who provide care <5 years and patients without complications tend to experience moderate burnout and do not indicate differences between the two groups. The length of time patients suffer from DM is related to the severity of the disease and the risk of complications that may occur (Simanjuntak, 2020). Acute complications, if not treated immediately, can harm the individual (Nusantara, 2019). Complications of Diabetes Mellitus will impact the quality of human resources and a considerable increase in health costs. This condition causes stress for caregivers and is prone to burnout.

Table 2. The mean difference in burnout score between the intervention and control group

Group	Means		Mean Differences	Z	p-value
	Pre test	Post test			
Intervention	59.74	45.31	-14.43	-4.629	<0.001
Control	50.41	59.18	8.77	-3.125	0.002

Burnout scores of intervention group caregivers before the intervention (pretest) had an average score of 59.74, and after the FCEM intervention (posttest), which showed a significant decrease in the average score, namely to 45. The decrease in burnout scores in caregivers can occur as a result of providing the Family Caregiver Empowerment Model

intervention, which focuses on family empowerment that is applied educationally, training, and mentoring to families who are caring for family members with T2DM conditions in proper management (Rondhianto, 2020).

The FCEM intervention is carried out over a relatively long period and is packaged

with a simple concept so the family caregiver readily accepts it. Indications of an empowered family are characterized by increased knowledge, motivation, spirituality, coping, family coherence, and family support to strengthen family values in family caregivers that are better than before the intervention (Rondhianto, 2022). This triggers changes in the family mindset in dealing with health problems, the ability to make decisions, provide care to family members, use available health facilities and the family's ability to modify the family (Firmansyah, 2019).

Burnout scores in caregivers of patients with T2DM can decrease due to the increased capabilities of family caregivers who can carry out their role as collaborators of health workers in self-care of T2DM at home. As a result of the empowerment, the family caregiver's knowledge in managing T2DM increases and can increase the family caregiver's self-awareness, self-efficacy, and self-control. If the family's self-awareness, self-efficacy and self-control increase, the family's capability will also automatically increase. When encountering various obstacles, families with good capabilities tend not to experience prolonged stress that leads to burnout. The significant results obtained in the study were supported by respondents who were open and cooperative during the research process. This condition supports the research process in running more effectively so that aspects of the intervention can be conveyed well and the discussion process runs smoothly.

The control group was not given special treatment, but respondents continued receiving educational programs from health facilities. The results showed that the average caregiver burnout score at the pretest was 50.41, and at the posttest, showed an increase to 59.18. According to the results of interviews with Posbindu (Integrated Guidance Post for Non-Communicable Diseases) cadres, there are educational and examination facilities that patients and families can access. However, the control group has yet to fully utilize the available health facilities, resulting in a lack of education on the care and management of T2DM. The respondent also explained that he rarely utilized health facilities in the form of posbindu, so he received less education

related to T2DM management. This indicates that the control group needs to perform family health duties optimally. Implementing family health tasks plays an important role in creating the welfare and health of patients (Hanani, 2019). This was a factor in the increase in burnout Burnout scores of intervention group caregivers before the intervention (pretest) had an average score of 59.74, and after the FCEM intervention (posttest), which showed a significant decrease in the average score, namely to 45. The decrease in burnout scores in caregivers can occur as a result of providing the Family Caregiver Empowerment Model intervention, which focuses on family empowerment that is applied educationally, training, and mentoring to families who are caring for family members with T2DM conditions in proper management (Rondhianto, 2020). scores in the control group.

Table 3. Results Mann Whitney Burnout for Burnout in the Intervention Group and the Control Group

Variable	Median (Min-Max)	Mean Rank	p
Difference			
Intervention	46 (26-57)	21.19	<0.001
Difference	61 (50-73)	52.14	
Control			

There was a decrease in burnout scores in the intervention group and an increase in the control group. The decrease in burnout scores in the intervention group is evidenced by a more significant decrease in the mean difference score obtained by the intervention group. The results of the Mann-Whitney test also showed a significant difference in burnout caregivers of people with T2DM. The Mann-Whitney test on burnout indicators also showed significant differences between the two groups' emotional exhaustion and depersonalization scores. It can be concluded that FCEM affects burnout in caregivers of patients with T2DM in the working area of the Sumbersari Health Center.

The decrease in burnout scores in the intervention group was influenced by the provision of special treatment in the form of FCEM intervention to families. FCEM is known to improve the ability of family

caregivers to manage diabetes diet, physical activity, medication, blood sugar monitoring, and foot care (Rondhianto et al., 2022). This can make family caregivers carry out family health tasks, namely recognizing family health problems, deciding on health actions, providing care to family members, modifying the environment, and accessing health facilities.

The control group showed an increase in the average burnout score. This may occur because respondents in the control group did not receive treatment in the form of FCEM intervention like the intervention group. Based on interviews with family caregivers in the control group show that they need to utilize health facilities in posbindu so that they only get a little information about the basic concepts of DM in general. The preliminary study results show that 4 out of 10 families with family members with T2DM have never received health education related to the management and care of Type 2 Diabetes Mellitus. These results show that there is still a need for more family capability as family caregivers. Other factors that cause the increase in burnout scores in the control group can be caused by aspects outside the study, such as individual characteristics, work environment, and emotional involvement with services.

4. CONCLUSION AND SUGGESTION

Based on the results of research and discussion regarding the effect of the Family Caregiver Empowerment Model intervention on Burnout in Caregivers with Type 2 Diabetes Mellitus, it can be concluded that the FCEM intervention influences the form of a decrease in burnout scores in caregivers of patients with Type 2 Diabetes Mellitus at the Sumbersari Health Center. Nurses can apply FCEM to family caregivers to help improve family capabilities and control burnout in caregivers of people with T2DM.

5. REFERENCE

Alsaedi, Y. E., Almalki, A. A., Alqurashi, R. D., Altwairqi, R. S., Almalki, D. M., Alshehri, K. M., Alamri, A. A., & Alswat, K. A. (2022). Assessment of Type II Diabetes Patients' Caregivers' Burnout Level: A Cross-Sectional Study in Taif, Saudi Arabia. *Diabetes, Metabolic Syndrome and Obesity*,

15(April), 1091–1099. <https://doi.org/10.2147/DMSO.S357340>

Ansari, R. M., Harris, M. F., Hosseinzadeh, H., & Zwar, N. (2022). Experiences of Diabetes Self-Management: A Focus Group Study among the Middle-Aged Population of Rural Pakistan with Type 2 Diabetes. *Diabetology*, 3(1), 17–29. <https://doi.org/10.3390/diabetology3010002>

International Diabetes Federation. (2021). International Diabetes Federation. In *Diabetes Research and Clinical Practice*, 102(2). <https://doi.org/10.1016/j.diabres.2013.10.013>

Ahmadi, B., Sabery, M., & Adib-Hajbaghery, M. (2021). Burnout in the primary caregivers of children with chronic conditions and its related factors. *Journal of Client-Centered Nursing Care*, 7(2), 139-148. 10.32598/JCCNC.7.2.360.1

Anto, R. P., Harahap, T. K., Sastrini, Y. E., Trisnawati, S. N. I., Ayu, J. D., Sariati, Y. & Mendo, A. Y. (2023). Perempuan, Masyarakat, Dan Budaya Patriarki. *Penerbit Tahta Media*.

Asih, S. W., & Wahyuni, S. (2021). Family Health Education sebagai Pencegahan Penularan Covid-19 pada Keluarga Dengan Komorbid Diabetes Mellitus. *JIKES (Jurnal Ilmu Kesehatan)*, 4(2), 60-65. 10.33006/ji-kes.v4i2.204

Azwar, S. (2022). Penyusunan Skala Psikologi (edisi 2). Yogyakarta: Pustaka Pelajar

Banovcinova, A., Levicka, J., & Veres, M. (2014). The impact of poverty on the family system functioning. *Procedia-Social and Behavioral Science*, 132, 148-153. doi:10.1016/j.sbspro.2014.04.291.

Cohen, R. I. (2018). Lean methodology in health care. *Chest*, 154(6), 1448-1454.

Fauzian, R. (2020). *Pengantar Psikologi Perkembangan*. CV Jejak (Jejak Publisher).

Firmansyah, M. R. (2019). Mekanisme Koping Dan Efikasi Diri Dengan Manajemen Perawatan Diri Pasien Diabetes Melitus Tipe 2. *Babul Ilmi Jurnal Ilmiah Multi Kesehatan*, 11(1). <https://doi.org/10.36729/bi.v11i1.924>

- Hakim, L. N. (2020). Urgensi revisi undang-undang tentang kesejahteraan lanjut usia. *Sumber*, 17(6). <https://doi.org/10.46807/aspirasi.v11i1.1589>
- Lambrinou, E., Hansen, T. B., & Beulens, J. W. J. (2019). Lifestyle factors, self-management and patient empowerment in diabetes care. *European Journal of Preventive Cardiology*, 26(2_suppl), 55–63. <https://doi.org/10.1177/2047487319885455>
- Luthfa, I. (2018). Peran Keluarga Merawat Lansia Pasca Stroke. In *Unissula Nursing Conference Call For Paper & National Conference 1.1*, Pp. 62-69). <http://dx.doi.org/10.26532/v1i1.2888.g2102>
- Maharani, R., Amir, N., Tornoto, K., Molintao, W., Muftadi, M., Said, F., & Yusrini, Y. (2023). Efektifitas Psikoedukasi Terhadap Tingkat Burnout Caregiver Klien Skizofrenia di Desa Kersamanah Kabupaten X. *MAHESA : Malahayati Health Student Journal*, 3(5), 1283-1296. doi:<https://doi.org/10.33024/mahesa.v3i5.10326>
- Nagori, A. (2023). *A Study of Effect of the Caregiving Burden on the Resilience and Burnout among Caregivers of Diabetic Family Members*. 2(April), pp 164–182.
- Nusantara, A. F., Sunanto, S., & Kusyairi, A. (2019). Support System Keluarga dalam Pencegahan Ketoasidosis Diabetik pada Anak dengan DM Tipe 1. *Jl-KES (Jurnal Ilmu Kesehatan)*, 3(1), 1-6. [10.33006/ji-kes.v3i1.122](https://doi.org/10.33006/ji-kes.v3i1.122)
- Rondhianto, R., Nursalam, N., Kusnanto, K., & Melaniani, S. (2020). Development of family caregiver empowerment model (FCEM) to improve family caregiver capability on type 2 diabetes self-management. Doi: [10.31838/srp.2020.6.149](https://doi.org/10.31838/srp.2020.6.149)
- Rondhianto, R., Nursalam, N., Kusnanto, K., & Melaniani, S. (2021). Pengelolaan Mandiri Diabetes Mellitus Tipe 2 Di Rumah.
- Rondhianto, R., Nursalam, N., Kusnanto, K., & Melaniani, S. (2022). The effect of family caregiver empowerment interventions on family caregiver capabilities in self-management of type 2 diabetes mellitus in Indonesia. DOI:10.1016/j.enfcl.2022.01.005
- Simanjuntak, G. V., & Simamora, M. (2020). Lama Menderita Diabetes Mellitus Tipe 2 Sebagai Faktor Risiko Neuropati Perifer Diabetik. *Holistik Jurnal Kesehatan*, 14(1), 96-100. <https://doi.org/10.33024/hjk.v14i1.1810>
- Swartz, K., & Collins, L. G. (2019). Caregiver care. *American Family Physician*, 99(11), 699–706.
- Teti Rahmawati, S. R. (2019). Karakteristik Dan Kesiediaan Caregivers Keluarga Dari Pasien Dengan Penyakit Kronis Tentang Pembentukan Support Group. *Jurnal Ilmiah Keperawatan Altruistik*, 2(2), 53–62. <https://doi.org/10.48079/vol2.iss2.42>
- Thongduang, K., Boonchieng, W., Chautrakarn, S., & Ong-Artborirak, P. (2022). The Influence of Family Caregiver Knowledge and Behavior on Elderly Diabetic Patients' Quality of Life in Northern Thailand. *International Journal of Environmental Research and Public Health*, 19(16). <https://doi.org/10.3390/ijerph191610216>
- Wahyuningrum, R., Wahyono, D., Mustofa, M., & Prabandari, Y. S. (2020). Masalah-Masalah terkait Pengobatan Diabetes Melitus Tipe 2: Sebuah Studi Kualitatif. *Indonesian Journal of Clinical Pharmacy*, 9(1), 26 <https://doi.org/10.15416/ijcp.2020.9.1.26>
- Widhianingtanti, L. T., & Lujtelaar, G. V. (2022). The Maslach-Trisni burnout inventory: adaptation for IndonesiaJP3I (Jurnal Pengukuran Psikologi dan Pendidikan Indonesia). *Jurnal pengukuran psikologi dan Pendidikan Indonesia*, 11(1), 1-21. [10.15408/jp3i.v11i1.24400](https://doi.org/10.15408/jp3i.v11i1.24400)