

ORIGINAL ARTICLE

Empowering families intervention and elderly groups to reduce the anxiety levels of elderly with diabetes mellitus in Indonesia

Komang Ayu Henny Achjar¹, Ketut Gama¹, Agus Sri Lestari¹, Ketut Sudiantara¹, Wayan Suardana¹

¹Department of Nursing, Poltekkes Kemenkes Denpasar, City of Denpasar, Province Bali, Indonesia

Corresponding Author: Komang Ayu Henny Achjar **Email:** komangayujanuari90@gmail.com

Received: 23 December 2023 **Revised:** 19 March 2024 **Accepted:** 24 March 2024 **Available online:** May 2024

DOI: 10.55131/jphd/2024/220209

ABSTRACT

Optimal care for elderly individuals with diabetes mellitus requires the involvement of both family members and elderly groups. This research investigated the impact of empowering elderly caregivers and families to provide independent care for individuals with diabetes mellitus and decrease their anxiety levels. The study utilized a quasi-experimental design with a comparison group design involving intervention and comparison groups comprising 128 elderly individuals and 128 families. The HARS questionnaire and researchers' family capability questions were used in a two-month intervention aimed at assisting elderly people with diabetes mellitus to manage their anxiety levels independently. Families in independent care received weekly assistance from elderly individuals and nurses. The intervention given to the elderly and their families in the intervention group was an elderly and family empowerment program for caring for elderly patients with diabetes mellitus. Following the intervention, a post-test was administered to respondents to assess their anxiety levels using the HARS questionnaire, which was analyzed using both independent and dependent T tests. The intervention significantly improved the family's knowledge, attitudes, and skills in caring for the elderly ($p = 0.001$). The intervention group showed a significant decrease in anxiety levels, as indicated by a p -value of 0.003. In conclusion, empowering families and the elderly group enhances their ability to care for elderly people with diabetes mellitus independently at home and reduces their anxiety levels. This study emphasizes the significance of education and support for families and elderly caregivers in enhancing their caregiving abilities, improving outcomes, and reducing anxiety.

Key words:

anxiety; elderly group; diabetes mellitus; family empowerment

Citation:

Komang Ayu Henny Achjar, Ketut Gama, Agus Sri Lestari, Ketut Sudiantara, Wayan Suardana. Empowering families intervention and elderly groups to reduce the anxiety levels of elderly with diabetes mellitus in Indonesia. *J Public Hlth Dev.* 2024;22(2):107-118 (<https://doi.org/10.55131/jphd/2024/220209>)

INTRODUCTION

Anxiety is closely related to the condition of patients with chronic or acute diabetes mellitus. Diabetes mellitus is ranked 7th among the 10 most common non-communicable diseases in the world.^{1,2} Patients with diabetes mellitus often experience anxiety due to the stress of managing their condition, which can affect their overall well-being and quality of life. By addressing anxiety in patients with diabetes mellitus, health care providers can help improve their overall health and quality of life.^{3,4}

Approximately 463 million adults between the ages of 20 and 79 years have type 2 diabetes mellitus, and by 2030, this number is predicted to rise to 578 million. The illness has a substantial financial impact on both the global healthcare system and overall global economy. According to National Health Coverage claims, the average outpatient cost for T2DM patients in 2016–2017 was USD 9574 for every seven days of therapy.⁵

The incidence of diabetes mellitus in Indonesia is recorded as being experienced by 10.9% of the Indonesian population aged ≥ 15 years. Diabetes mellitus, which requires disciplined and long-term (chronic) treatment, often causes anxiety disorders in patients.⁶ Patients with diabetes mellitus have a high potential to develop anxiety disorders. Anxiety disorders appear as a form of inability to overcome existing stressors, such as dealing with, accepting, and treating type 2 diabetes mellitus. In addition to endangering the patient's psychological condition, anxiety can increase hormone production. This can worsen diabetes mellitus.⁷ Anxiety triggers the release of glucocorticoid hormones, which results in increased blood glucose levels.⁸

Counter-regulatory hormones, such as glucocorticoids, neurotransmitters, glucagon, growth hormones, and

catecholamines, are activated under psychological stress.⁹ The action of insulin is impeded by the activation of opposing regulatory hormones, leading to an increase in blood glucose rather than a decrease in glucose levels. High blood glucose levels make it more difficult to maintain metabolic regulation. Patients' despair and anxiety can be exacerbated or caused entirely by poor glycemic control and functional impairment as a result of increased complications from diabetes.¹⁰

Optimal psychological care can be provided with the support of those closest to the patient, such as the family and surrounding community. Elderly people with diabetes mellitus, after their treatment period ends in health service facilities, whether hospitals or community health centers, require continuity of care at home.^{11,12,13} Continuity of care necessitates the role of the family; therefore, educational support is very important for the family.

The intervention provided to the elderly and their families in the intervention group was an elderly and family empowerment program in caring for elderly patients with diabetes mellitus. This empowerment program involves community nurses as educators in providing assistance to update information about the appropriate management of diabetes mellitus in terms of physical and psychological care. Thus, this intervention was deemed necessary for this research because it is hoped that intervention can increase family knowledge and skills in caring for elderly diabetes mellitus patients, thereby improving the patient's quality of life and reducing the risk of complications that may occur. In addition, it is hoped that the interventions carried out will become an example for policymakers, especially in the provinces of Bali and Lampung, thereby encouraging successful care of elderly people with diabetes.

The family is able to play a role in preparing food, reminding them to take

medication, and most importantly, how the family is able to build healthy coping strategies for the elderly. Community nurses are responsible for public health and play a role in providing multi-level education regarding the management of diabetes mellitus, from nurses to the elderly group, and then to families who care for elderly people with diabetes mellitus.^{14,15} Continuity of care was established to help manage diabetes mellitus and increase constructive coping in the elderly population.

This study examined how empowering family members and the elderly can help people with diabetes mellitus live more independently and experience less worry. The novelty of this research is that it focuses on the role of family members and elderly groups in empowering elderly individuals with diabetes mellitus.

METHOD

Design

This study was conducted using a quasi-experimental design involving both the intervention and comparison groups. The intervention group will receive specific treatments or interventions, whereas the control group will not receive any such treatments. This approach was performed to compare the effect of the intervention given to the intervention group with the conditions experienced by the comparison group without the intervention.

Population and sample

The population of this study was quite large; therefore, the sample size was determined using the Slovin's formula, and the number of samples per region was 64, which were divided into comparison and intervention groups. Thus, the total sample size was 128 elderly individuals. We used a simple random sampling technique to

obtain a representative sample. The technique used was to reach all respondents by collaborating with community health centers in the Bali and Lampung provinces, so that interventions could be carried out within two months, separate from other research activities such as respondent data collection schedules, pre-tests, post-tests, and briefing with respondents. These activities were carried out in one place in one province on a predetermined day in collaboration with the community health center.

Research Procedure and instrument

The research process was divided into three stages: pretest, intervention, and posttest. However, the comparison group underwent only the pre-test and post-test stages. The pre-test stage was conducted by administering a questionnaire regarding the level of anxiety in the elderly based on the Hamilton Rating Scale (HARS), which consists of 14 questions. The HARS is a standard instrument with a validity value of > 0.005 and has been tested for a mean with a Cronbach's alpha value of 0.793 (> 0.6). The results of the anxiety assessment were classified as no anxiety (0-6), mild anxiety (7-14), moderate anxiety (15-27), and severe anxiety (> 27). Meanwhile, in the family, an assessment of the family's ability to provide care for elderly people with diabetes mellitus was carried out. The instrument used to measure the family's ability to care for elderly people with diabetes mellitus (knowledge, attitudes, and skills) was developed by researchers. The family knowledge instrument consists of 15 items with correct (1) and incorrect (0) answers. Attitudes were assessed using 15 items with a Likert scale of 0-3 (0 = strongly disagree, 1 = disagree, 2 = agree, 3 = strongly agree) and 15 items with complete (1) and incomplete (0) answers. The intervention given to the elderly and their families in the intervention group was

an elderly and family empowerment program for caring for elderly patients with diabetes mellitus. This empowerment program involves community nurses as educators in providing assistance to update information about the appropriate management of diabetes mellitus in terms of physical and psychological care. Before the intervention, community nurses provided health education to the elderly group regarding the description of diabetes mellitus, how to provide appropriate care, and the role of the family in assisting with physical and psychological care for elderly people with diabetes mellitus. After receiving education from the nurse, the cadre provides the same knowledge to the family regarding the description of diabetes mellitus, appropriate treatment, and the role of the family in helping to care for elderly people with diabetes mellitus, both physically and psychologically. The intervention was carried out for two months, during which the family independently cared for elderly people with diabetes mellitus from a physical and psychological perspective. In independent care, families are also provided with assistance from the elderly group twice a week and from nurses once a week. After the intervention, participants in the intervention and comparison groups were given a post-test for anxiety levels based on

the Hamilton Rating Scale (HARS) questionnaire.

Data Analysis

To determine the effect of the empowerment program, data testing was carried out using a dependent t-test and independent t-test analysis. Dependent t-test analysis was used to compare the mean scores of participants before and after the program, while independent t-test analysis was used to compare the mean scores of participants who went through the program with those who did not. These statistical tests allowed for a comprehensive evaluation of the program's impact on the participants. Variables were considered to have significant differences if the significance value was <0.05 .

Ethical Approval

This study was approved by the Denpasar Ministry of Health Polytechnic Health Ethics Committee (number LB. 02.03/EA/KEPK/0297/2023). This number shows that this study met the ethical standards set by the Denpasar Ministry of Health Polytechnic Ethics Committee. This ensured that this research was carried out by considering the interests and welfare of the research subjects and avoiding all forms of ethical violations.

RESULTS

Table 1. Characteristics of Elderly People with Diabetes Mellitus and Characteristics of Elderly Family Respondents Based on Gender and Education

Characteristics of Elderly People with Diabetes Mellitus		
Variable	Intervention	Comparison
	Frequency	Frequency
Age		
Min-Max	56 – 90	60 – 87
Means	66.28	67.38
Long Suffering From Diabetes Mellitus		
Min-Max	0 – 39	0 – 22
Mean	6.02	8.31

Characteristics of Elderly People with Diabetes Mellitus		
Variable	Intervention Frequency	Comparison Frequency
Sex		
Male	25 (39.1%)	26 (40.6%)
Female	39 (60.9%)	38 (59.4%)
Characteristics of Elderly Families with Diabetes Based on Gender and Education		
Age		
Min-Max	22 -75	20 – 78
Mean	47.56	48.86
Sex		
Male	47 (73.4%)	23 (35.9%)
Female	17 (26.6%)	41 (64.1%)
Education		
< Senior high school	20 (31.2%)	12 (18.8%)
≥ Senior high school	44 (68.8%)	52 (81.2%)

Elderly respondents in the provinces of Bali and Lampung who had diabetes mellitus in the intervention group had an average age of 66 years, whereas the comparison group was 67 years old. Elderly people in the intervention group had diabetes mellitus for six years, while those in the comparison group had diabetes mellitus for eight years. Most of the older respondents included in this study in the intervention and comparison groups were women.

The average age of the families of elderly people with diabetes who were

involved in this study and were responsible for caring for elderly people with diabetes mellitus was 47 years in the intervention group and 48 years in the comparison group. Families involved in caring for elderly respondents with diabetes mellitus were dominated by men in the intervention group (73.4%) and women in the comparison group (64.1%). In addition, family education status in both groups was dominated by senior high school graduates.

Table 2. Differences in anxiety among elderly people with diabetes mellitus in the comparison and intervention groups

Variable	Mean	Elementary School	Standard Deviation	<i>P</i>	Frequency
Intervention Group					
Before	7.86	4.591	0.574	0.000	64
After	4.80	3.941	0.493		
Comparison Group					
Before	10.09	9.595	1.199	0.001	64
After	7.38	8.413	1.052		

*dependent t-test

The anxiety scores experienced by elderly respondents with diabetes mellitus before and after the intervention in the intervention group averaged 7.84 (mild anxiety) to 4.80 (not anxious), and in the comparison group, they ranged from 10.09 (moderate anxiety) to 7.38 (mild anxiety). These results indicate that the intervention

in the intervention group was successful in reducing the anxiety levels of elderly respondents with diabetes mellitus. In addition, the comparison group experienced a decrease in anxiety levels, although not to the same extent as the intervention group.

Table 3. Differences in anxiety of elderly people with diabetes mellitus after treatment in the Comparison and intervention groups

Variable	Mean	elementary school	Standard Deviation	<i>P</i>	Frequency
Intervention (After)	4.80	3.941	0.493	0.028	128
Comparison (After)	7.38	8.413	1.052		

*independent t test

The difference in decreasing scores and anxiety levels between the elderly people with diabetes mellitus in the intervention and comparison groups after treatment was 0.028. These results indicate that the intervention group experienced a

more significant reduction in scores and anxiety levels than the control group. These findings can serve as a basis for developing more effective intervention strategies for managing anxiety in elderly individuals with diabetes mellitus.

Table 4. Differences in family capabilities caring for elderly people with diabetes mellitus between the intervention and Comparison groups

Variable	Intervention Group			Comparison Group		
	Mean	<i>P</i>	Frequency	Mean	<i>P</i>	Frequency
Knowledge						
Before	76.98	0.000	64	81.15	0.711	64
After	88.23		64	81.56		64
Total			128			128
Attitude						
Before	191.56	0.858	64	177.08	0.000	64
After	192.08		64	190.93		64
Total			128			128
Skills						
Before	84.17	0.000	64	65.72	0.938	64
After	92.18		64	65.83		64
Total			128			128

*dependent t-test

The value of the family's ability to care for elderly people with diabetes mellitus at home as measured by family

knowledge, attitudes, and skills in the intervention group tends to increase; namely, the mean value of knowledge (pre-

post) increased from 76.98 to 88.23, attitude (pre-post) increased from 191.56 to 192.08, and skills (pre-post) increased from 84.17 to 92.18. With the increase in the mean value of family knowledge, attitudes, and skills in the intervention group, it can

be concluded that the family's ability to care for elderly people with diabetes mellitus at home experienced a significant improvement. This shows the effectiveness of the intervention provided in improving knowledge, attitudes and skills.

Table 5. Differences in family ability to care for elderly people with diabetes mellitus after treatment between the intervention and Comparison groups

Variable	Means	Elementary school	Standard Deviation	<i>P</i>	Frequency
Knowledge (After)					
Intervention	88.23	10.34	1.29	0.002	64
Comparison	81.56	13.16	1.64		64
Total					128
Attitude (After)					
Intervention	192.08	25.80	3.22	0.810	64
Comparison	190.94	27.87	3.48		64
Total					128
Skills (After)					
Intervention	92.18	13.15	1.64	0.000	64
Comparison	65.83	29.30	3.66		64
Total					128

*independent t test

The results of the analysis showed that families in the intervention group had better knowledge and skills in providing post-treatment care than those in the control group. This difference is significant, with a p-value of 0.002 for knowledge and 0.000 for skills. These findings suggest that the intervention program effectively enhanced the understanding and ability of families to deliver post-treatment care. The statistically significant p values strongly indicate that the intervention group had significantly higher levels of knowledge and skills than the comparison group.

DISCUSSION

Based on the results of the analysis carried out on elderly respondents with diabetes mellitus, those in the intervention group were 66 years old on average, and in

the comparison group, the average age was 67 years, which was dominated by elderly women. The onset of diabetes mellitus was experienced chronically (i.e., for more than 3 months), namely for 6 years in the intervention group and for 8 years in the comparison group.

The prevalence of diabetes mellitus in elderly women is greater than that in men because women's life expectancy is longer than that of men. This is in accordance with the finding that the number of elderly women (10.1%) in Indonesia is 1% more than that of elderly men (9.10%). The long duration of diabetes mellitus experienced by the elderly respondents also triggers self-anxiety disorders. Patients who have suffered from diabetes mellitus for less than 10 years tend to experience anxiety more easily due to a lack of experience and self-care habits. Anxiety scores in elderly

people with diabetes mellitus before and after the intervention in the intervention group ranged from 7.84 (mild anxiety) to 4.80 (not anxious), and in the comparison group, they ranged from 10.09 (moderate anxiety) to 7.38 (anxious light). There was also a significant relationship between diabetes mellitus and anxiety levels, with a p-value of 0.012 and moderate correlation value (0.426). The emergence of anxiety in elderly people with diabetes mellitus can have a negative impact on their physical health condition.^{16,17} Anxiety tends to disrupt carbohydrate metabolism due to the release of epinephrine, which increases the breakdown of glycogen in the liver. In addition, ACTH is a follow-up hormone that can increase, thereby activating the adrenal cortex, which releases glucocorticosteroid hormones such that an increase in glucogenesis triggers excess glucose levels in the blood.¹⁸

The elderly families referred to in this research are people who live with the elderly every day and are tasked with dealing with them to overcome their health problems, especially diabetes mellitus problems. The average age of the respondent's family in the intervention group was 47.56 years and 48.86 years in the comparison group. Family respondents in the intervention group were dominated by men, whereas those in the comparison group were dominated by women. In both groups, the family companions were high school graduates.

The average age of the families in the productive range is between 15-64 years. This facilitates the process of providing management of diabetes mellitus in the elderly population. Apart from being in the productive age range, the majority of accompanying families also have a high school education or above, which is one of the factors that influence the learning process, and a higher level of education can facilitate the process of gaining knowledge. Therefore, having a family's educational status above high school will help facilitate

the processing of information obtained by the family from the elderly group regarding the care of elderly people with diabetes mellitus.^{19,20}

Anxiety can arise from chronic diseases that are continuously being accompanied by the same treatment. Similar to diabetes experienced by the elderly, they are required to be able to maintain their diet, take medication regularly, and carry out physical activity in a disciplined manner. The large amount of care required causes the elderly people to make spontaneous adjustments. In this study, 6.67% of the patients with diabetes experienced high anxiety about death, 36.67% experienced moderate anxiety, and the rest experienced mild anxiety. This illustrates the importance of social support for patients with diabetes mellitus, especially those experienced by the elderly, who still have the motivation to undergo treatment. The American Diabetes Association recommends that psychosocial care be integrated collaboratively in the care of diabetes mellitus patients to optimize care and quality of life for these patients.²¹

The condition of the elderly, which continues to decline with age, highlights the importance of family members in the care process.²² The family, as the community group closest to the elderly, can optimize their role in providing social support to the elderly. The involvement of family, friends, and health workers is an important aspect of the success of providing social support to people with diabetes mellitus. In providing social services and support, it is necessary to increase community capacity so that individuals and families can achieve behavioral changes (knowledge, attitudes, and actions) and family independence according to their needs in an effort to improve, protect, and restore their health status.²³ The study demonstrates that families independently provide elderly care to reduce anxiety levels with the help of elderly groups and nurses. Intervention

groups received training on diabetes management, medication, diet, and exercise, and emphasized therapeutic communication.

Along with an increase in family capabilities in terms of knowledge (0.002) and skills (0.000), the level of anxiety in the elderly decreased in the intervention group (0.000). It has been proven that increasing the family's ability in terms of knowledge, attitudes, and skills in providing care for the elderly causes a significant reduction in anxiety. Thus, increasing family capacity cannot be separated from empowering elderly families. Empowering an elderly group can motivate the community to provide health services independently. The healthy elderly groups are local residents who are selected based on their abilities and responsibilities in carrying out health monitoring and education duties and moving the community towards a healthy life.

The increase in family knowledge and skills in the intervention group was due to the multilevel education provided by community nurses to the elderly group and families. This is important so that families can help the elderly in managing diabetes mellitus through both pharmacological and non-pharmacological treatments. According to Ballestero (2015), increased knowledge among adults tends to develop after receiving training.²⁴ Abel (2015) also explained that mentoring by licensed nurses has a more positive effect on patients.²⁵ The quality of the nurses and elderly people who are responsible influences the process of receiving education within the family. Health education is not only intended to improve knowledge, attitudes, and health practices but also to improve the physical and non-physical environment to maintain and improve the health of the elderly.²⁶

The success of family empowerment in the health sector depends on the human resources (health workers,

elderly groups, families, and the elderly) participating in family empowerment activities, the amount of funds used in family empowerment activities, and the materials and tools used to carry out these activities.²⁷ Success of social support provided by the family and community in reducing anxiety in patients with diabetes mellitus is well documented. There is a strong relationship between social support and the level of anxiety in patients with diabetes mellitus.^{28,29} Apart from diabetes mellitus, empowering families to provide care for the elderly has also proven effective in improving their quality of life. The quality of life of elderly people with hypertension has improved after families have been trained to treat it.^{30,31} Empowering families to care for older people with diabetes mellitus can benefit from the harmonious relationships of each individual in the family.³² Families that support each other discuss decisions and engage in intense communication. Communication relationships and time optimization for family togetherness are a series of elements that create a balanced family³³.

RECOMMENDATIONS

The research showed that the intervention group showed increased family abilities in knowledge, attitudes, and skills, with significant differences noted before and after the intervention. The intervention implemented in the intervention group was successful in reducing the anxiety levels of elderly respondents with diabetes mellitus. In addition, the comparison group experienced a decrease in anxiety levels, although not to the same extent as the intervention group. Research on older adults and their families in the Bali and Lampung Provinces requires a special approach due to differences in family

culture. These findings imply that targeted interventions can effectively improve family abilities and reduce anxiety levels in elderly individuals with diabetes mellitus, highlighting the importance of tailored support for this population. Further research could explore the long-term effects of such interventions and potential strategies to enhance outcomes in both intervention and comparison groups. Considering the cultural variations in family dynamics between the Bali and Lampung Provinces, future studies should consider these differences to develop tailored interventions that effectively empower families in providing extended care for older adults.

ACKNOWLEDGMENTS

The researchers would like to thank the Ministry of Health, Indonesia, which funded this research with number HK.02.03/P3M/6031. Funding provided by the Ministry of Health, Indonesia, has been instrumental in supporting the progress and success of this research project. The researchers express their gratitude for the financial support received, which has enabled them to carry out their investigations and contribute to the advancement of knowledge in this field.

CONFLICT OF AUTHORS

The authors declared no conflict of interest.

REFERENCE

1. Daré LO, Bruand PE, Gérard D, Marin B, Lameyre V, Boumédiène F, et al. Associations of mental disorders and neurotropic parasitic diseases: A meta-analysis in developing and emerging countries. *BMC Public Health*. 2019;19(1):1–12. doi: 10.1186/s12889-019-7933-4
2. Li Y, Hou T, Cheng M, Miao Y, Yeerjang Y, Sheng C sheng, et al. Anxiety prevalence and its association with physical activity in patients with non-communicable diseases during COVID-19 lockdown: a cross-sectional study in Shanghai, China. *BMC Public Health*. 2023;23(1):1–10. doi: <https://doi.org/10.1186/s12889-022-14369-1>
3. Bickett A, Tapp H. Anxiety and diabetes: Innovative approaches to management in primary care. *Exp Biol Med*. 2016;241(15):1724–31. doi: 10.1177/1535370216657613
4. Kalra S, Jena BN, Yeravdekar R. Emotional and psychological needs of people with diabetes. *Indian J Endocrinol Metab*. 2018;22(5):696–704. doi: 10.4103/ijem.IJEM_579_17
5. Ogle GD, James S, Dabelea D, Pihoker C, Svensson J, Maniam J, et al. Global estimates of incidence of type 1 diabetes in children and adolescents: Results from the International Diabetes Federation Atlas, 10th edition. *Diabetes Res Clin Pract*. 2022; 183:109083. doi: <https://doi.org/10.1016/j.diabres.2021.109083>
6. Soeatmadji DW, Rosandi R, Saraswati MR, Sibarani RP, Tarigan WO. Clinicodemographic Profile and Outcomes of Type 2 Diabetes Mellitus in the Indonesian Cohort of DISCOVER: A 3-Year Prospective Cohort Study. *J ASEAN Fed Endocr Soc*. 2023;38(1):68–74.
7. Duerr HA. Treating Patients With Comorbid Anxiety and Diabetes Mellitus. *Psychiatr Times*. 2019; 36(6): 11–4.
8. Sharma K, Akre S, Chakole S, Wanjari MB. Stress-Induced Diabetes: A Review. *Cureus*. 2022;14(9):1–6.
9. Sarwar H, Rafiqi SI, Ahmad S, Jinna S, Khan SA, Karim T, et al. Hyperinsulinemia Associated Depression. *Clin Med Insights Endocrinol Diabetes*. 2022;15:1–6.

10. Sharma K, Dhungana G, Adhikari S, Bista Pandey A, Sharma M. Depression and Anxiety among Patients with Type II Diabetes Mellitus in Chitwan Medical College Teaching Hospital, Nepal. *Nurs Res Pract*. 2021;2021:1–8.
11. WHO. Continuity and coordination of care A practice brief to support implementation of the WHO Framework on integrated people-centred health services. 2018. 76 p.
12. Chan KS, Wan EYF, Chin WY, Cheng WHG, Ho MK, Yu EYT, et al. Effects of continuity of care on health outcomes among patients with diabetes mellitus and/or hypertension: a systematic BMC Fam Pract [Internet]. 2021;22(1):1–13. doi: <https://doi.org/10.1186/s12875-021-01493-x>
13. Munshi MN, Florez H, Huang ES, Kalyani RR, Mupanomunda M, Pandya N, et al. Management of diabetes in longterm care and skilled nursing facilities: A position statement of the American diabetes association. *Diabetes Care*. 2016;39(2):308–18. doi: 10.2337/dc15-2512.
14. Egbugie BA, Delobelle PA, Levitt N, Puoane T, Sanders D, van Wyk B. Role of community health workers in type 2 diabetes mellitus self-management: A scoping review. *PLOS ONE*. 2018; 13(6):1–18. doi: 10.1371/journal.pone.0198424
15. Hartzler AL, Tuzzio L, Hsu C, Wagner EH. Roles and functions of community health workers in primary care. *Ann Fam Med*. 2018;16(3):240–5. doi: 10.1370/afm.2208
16. Azam M, Sulistiana R, Fibriana AI, Savitri S, Aljunid SM. Prevalence of mental health disorders among elderly diabetics and associated risk factors in Indonesia. *Int J Environ Res Public Health*. 2021;18(19):1–9. doi: 10.3390/ijerph181910301
17. Park M, Reynolds CF. Depression among older adults with diabetes mellitus. *Clin Geriatr Med*. 2015; 31(1):117–37. doi: 10.1016/j.cger.2014.08.022.
18. Falco G, Pirro PS, Castellano E, Anfossi M, Borreta G, Gianotti L. The Relationship between Stress and Diabetes Mellitus. *J Neurol Psychol*. 2015;3(1):1–7.
19. Baig AA, Benitez A, Quinn MT, Burnet DL. Family interventions to improve diabetes outcomes for adults. *Ann N Y Acad Sci*. 2015;1353(1):89–112. doi: 10.1111/nyas.12844.
20. Pamungkas RA, Chamroonsawasdi K, Vatanasomboon P. A systematic review: Family support integrated with diabetes self-management among uncomparisonled type II diabetes mellitus patients. *Behav Sci (Basel)*. 2017;7(3):1–17. doi: 10.3390/bs7030062
21. Young-Hyman D, De Groot M, Hill-Briggs F, Gonzalez JS, Hood K, Peyrot M. Psychosocial care for people with diabetes: A position statement of the American diabetes association. *Diabetes Care*. 2016;39(12):2126–40. doi: 10.2337/dc16-2053
22. Xie H, Peng W, Yang Y, Zhang D, Sun Y, Wu M, et al. Social Support as a Mediator of Physical Disability and Depressive Symptoms in Chinese Elderly. *Arch Psychiatr Nurs*. 2018; 32(2):256–62. doi: 10.1016/j.apnu.2017.11.012
23. Nies M, McEwen M. *Community/ Public Health Nursing: Promoting The Health of Populations*. 6th ed. St. Louise: Elsevier/Saunders; 2015. 712 p.
24. Ballesteros S. A randomized comparative trial of brain training with non-action video games in older adults : Results of the 3-month study. *Clin Trial*. 2015;7:1–12.
25. Abel C. Nurses Knowledge and Attitudes toward Implementation of

- Electronic Medical Records. *Int J Faith Community Nurs*. 2015;1(3).
26. Hasanica N, Catak A, Mujezinovic A, Begagic S, Galijasevic K, Oruc M. The Effectiveness of Leaflets and Posters as a Health Education Method. *Mater Socio Medica*. 2020;32(2):135-39. doi: 10.5455/msm.2020.32.135-139
 27. Hany A, Yulistianingsih E, Kusumaningrum BR. Family empowerment and family ability to self-care for heart failure patients in the intermediate care room. *Int J Public Heal Sci*. 2022;11(1):248–53.
 28. Chan CKY, Cockshaw W, Smith K, Holmes-Truscott E, Pouwer F, Speight J. Social support and self-care outcomes in adults with diabetes: The mediating effects of self-efficacy and diabetes distress. Results of the second diabetes MILES – Australia (MILES-2) study. *Diabetes Res Clin Pract*. 2020;166:108314. doi: 10.1016/j.diabres.2020.108314
 29. Ramkisson S, Pillay BJ, Sibanda W. Social support and coping in adults with type 2 diabetes. *African J Prim Heal Care Fam Med*. 2017;9(1):1–8.
 30. Alfie J, Cuffaro PE. Hypertension in the Elderly. *Encycl Biomed Gerontol Vol 1-3*. 2019;2(5):V2-258-V2-270.
 31. Ran L, Li M, Tan X, Chen Q. Health-related quality of life of middle-aged and elderly people with hypertension: A cross-sectional survey from a rural area in China. *PLOS ONE*. 2021;16:1–13. doi: 10.1371/journal.pone.0246409.
 32. Tu J, Liao J. Primary care providers' perceptions and experiences of family-centered care for older adults: a qualitative study of community-based diabetes management in China. *BMC Geriatr*. 2021;21(1):1–10. doi: 10.1186/s12877-021-02380-x
 33. Thomas PA, Liu H, Umberson D. Family Relationships and Well-Being. *Innov Aging*. 2017;1(3):1–11.