

RESEARCH ARTICLE

Family-Centred Education and Training to Improve Quality of Life in Indonesian Adults with Type 2 Diabetes: A Community-Based Intervention Study

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Abstract

Objective: To evaluate whether a family-centred education and training programmed improves diabetes knowledge and quality of life in patients with type 2 Diabetes Mellitus (DM) in Tasikmalaya, Indonesia.

Methods: A quasi-experimental community intervention was conducted at the Kahuripan primary health centre on 15 August 2025. Forty adults with type 2 DM and their family members participated. The programme comprised interactive lectures on diabetes and quality of life, practical training in self-monitoring of blood glucose, foot care, healthy menu planning and stress management, and provision

of a culturally adapted booklet ("Family Alert to Diabetes"). Knowledge was measured using a pre-validated questionnaire before and after the intervention, while clinical data (age, blood pressure, fasting and post-prandial glucose) and quality-of-life scores were recorded. Data were analysed descriptively; Shapiro-Wilk tests assessed normality and a Wilcoxon signed-rank test compared pre- and post-test knowledge.

Results: Participants were predominantly older adults (mean age 62.7 years). Baseline mean systolic/diastolic blood pressure was 143/80 mmHg and fasting blood glucose was 149 mg dL⁻¹. Quality-of-life scores were low, particularly in the physical domain (mean 51.36%). Mean knowledge scores improved from 78.5 (pre-test) to 81.8 (post-test); however, the difference did not reach statistical significance (Wilcoxon W=186.5, p=0.055). Participants with lower baseline scores showed the greatest improvement. Families reported increased confidence in supporting dietary adherence, physical activity and foot care.

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Conclusion: A short, family-centred education and training programme enhanced diabetes knowledge and self-care skills, although improvement was modest and not statistically significant. Longer follow-up and integration of psychosocial support may be required to

produce sustained, clinically meaningful gains in quality of life.

Key Words: *Family empowerment; Quality of life; Diabetes education; Community health; Indonesia*

Introduction

Diabetes mellitus is a chronic metabolic disorder characterised by hyperglycaemia due to impaired insulin secretion or action. The International Diabetes Federation estimated that 537 million adults lived with diabetes worldwide in 2021, and this figure is projected to reach 643 million by 2030 [1]. Indonesia is among the countries with the highest number of people with diabetes. National health surveys show a steady rise in prevalence, highlighting the need for comprehensive management strategies that address not only medical issues but also psychosocial and educational aspects [2]. Poor glycaemic control and complications such as retinopathy, neuropathy, nephropathy and cardiovascular disease adversely affect patients' Quality of Life (QoL). Effective self-management requires knowledge, skills and motivation, which can be difficult to achieve without adequate support.

Family involvement has been identified as an important determinant of diabetes outcomes. Studies show that family support can improve patients' adherence to diet and medication regimens, increase physical activity and reduce depressive symptoms [3-5]. In the context of Indonesian culture, family plays a central role in decision making and caregiving. However, many families lack adequate knowledge about diabetes and feel ill-equipped to provide care. Limited educational resources and the absence of structured family-centred programme further exacerbate this problem. A needs assessment at the Kahuripan health centre identified low

health literacy, minimal family involvement, absence of tailored education and psychosocial support as key barriers to optimal diabetes management. Against this background, we developed a family-centred education and training programme to empower patients and families with knowledge and practical skills. The present study reports the outcomes of this intervention.

Materials and Methods

Study design and setting

This was a community-based quasi-experimental intervention conducted at the Kahuripan primary health centre in Tasikmalaya, Indonesia. The programme was implemented on 15 August 2025. Ethical approval was obtained from the institutional review board of Poltekkes Kemenkes Tasikmalaya, and written informed consent was obtained from all participants.

Participants

Participants were recruited from members of the Prolanis diabetes club at the health centre. Eligibility criteria were: diagnosis of type 2 DM, aged ≥ 18 years, able to attend the full programme and accompanied by at least one family member. Forty participants (patients and families) consented to take part. Demographic and clinical characteristics were collected at baseline.

Intervention

The intervention consisted of three components:

- participatory education,

- practical skills training, and
- continuous supervision.

Education was delivered through interactive lectures, group discussions and visual media. Content covered the pathophysiology and complications of DM, glycaemic targets, dietary planning, medication adherence, physical activity, stress management and the role of family support. A culturally tailored booklet entitled “Family Alert to Diabetes” was developed and distributed. Practical training included demonstrations and supervised practice in self-monitoring of blood glucose, foot care, preparation of healthy menus using local foods, recognition and management of hypo- and hyperglycaemia and relaxation techniques. After the training, a whatsapp group was set up to facilitate ongoing communication, peer support and consultation with health professionals.

Measurements and data collection

Knowledge about diabetes and QoL was assessed using a pre-validated questionnaire adapted from previous research. The questionnaire comprised items on disease understanding, diet, medication adherence, physical activity and foot care. Scores ranged from 0–100; higher scores indicated better knowledge. Participants completed the questionnaire immediately before (pre-test) and after (post-test) the intervention. Clinical parameters measured at baseline included age, systolic and diastolic blood pressure, Fasting Blood Glucose (FBG) and Post-Prandial Blood Glucose (PPBG). QoL was assessed using the WHOQOL-BREF instrument, which yields scores in four domains: physical, psychological, social and environment (0–100, higher scores indicate better QoL). Data collection was supervised by trained research assistants.

Statistical analysis

Data were analysed using descriptive statistics. Normality of knowledge scores was tested with the Shapiro–Wilk test. As data were not normally distributed, pre- and post-test scores were compared using the Wilcoxon signed-rank test. Statistical significance was set at $p < 0.05$.

Results

Participant characteristics

The demographic and clinical characteristics of the 40 participants are summarised in (Table 1). The mean age was 62.74 years (range 33–82 years); the majority were older adults. Mean systolic/diastolic blood pressure was 143.3/80.3 mmHg. Baseline FBG averaged 149.1 mg dL^{-1} and PPBG 174.8 mg dL^{-1} , indicating suboptimal glycaemic control.

Quality-of-life domains

Baseline QoL scores assessed with the WHOQOL-BREF are presented in (Table 2). Scores in all domains were below 60%, with the physical domain being the lowest (51.36%), followed by psychological, environmental and social domains. These findings suggest that participants experienced poor QoL, particularly in terms of physical functioning.

Knowledge scores

Pre- and post-test knowledge scores are summarised in (Table 3). Mean pre-test knowledge was 78.50 ± 13.9 (range 35–100), while mean post-test knowledge increased to 81.75 ± 9.7 (range 60–100). The Shapiro–Wilk test showed that both pre- and post-test distributions were not normal ($p = 0.0019$ and $p = 0.0215$, respectively). The Wilcoxon signed-rank test yielded $W = 186.5$ and $p = 0.055$, indicating that the increase in knowledge was not statistically significant at the 5% level.

TABLE 1

Baseline demographic and clinical characteristics (N=40). FBG, fasting blood glucose; PPBG, post-prandial blood glucose.

Variable	Mean	Median	Min	Max
Age (years)	62.74	63.00	33.00	82.00
Systolic BP (mmHg)	143.32	138.50	95.00	202.00
Diastolic BP (mmHg)	80.29	79.00	54.00	105.00
Fasting glucose (mg dL ⁻¹)	149.05	128.50	82.00	323.00
Post-prandial glucose (mg dL ⁻¹)	174.76	179.00	42.00	318.00

TABLE 2

Distribution of quality-of-life scores by WHOQOL-BREF domain at baseline.

Domain	Mean score (%)	Category
Physical	51.36	Low
Psychological	54.17	Low
Social relationships	59.00	Low
Environment	55.56	Low

TABLE 3

Pre- and post-test knowledge scores.

Variable	Mean	Min	Max
Pre-test score	78.50	35	100
Post-test score	81.75	60	100

Discussion

This study evaluated a family-centred education and training programme for adults with type 2 DM and their families in Tasikmalaya. The programme focused on enhancing knowledge, self-care skills and family support, with the goal of improving QoL. Baseline data highlighted the urgent need for intervention: most participants were elderly, hypertensive and hyperglycaemic, and reported poor QoL especially in the physical domain. These results are consistent with previous evidence showing that older adults with diabetes in low and middle income countries experience a high burden of comorbidities and functional limitations [6–9].

Although the improvement in knowledge scores did not reach statistical significance, participants with lower baseline knowledge demonstrated meaningful gains. This finding aligns with prior

studies indicating that family-based education and empowerment can enhance diabetes self-management behaviours, especially among vulnerable groups [3–5]. The modest effect size observed may be explained by the short duration of the intervention and the absence of repeated reinforcement sessions, as sustained behavioral change often requires longer term engagement and follow up [10,11].

Despite improved knowledge, QoL scores remained low after the intervention. Changes in QoL typically occur over longer periods and are influenced by psychosocial, economic and environmental factors beyond disease knowledge alone [7,9]. Integrating mental health support and stress management strategies into diabetes education programmes may help address psychological barriers and improve overall well-being, as recommended by global NCD frameworks [12,13].

Overall, this study supports international evidence that family centred, community-based education is feasible and acceptable in resource limited settings and aligns with global strategies for NCD prevention and control [10-12]. Scaling up such interventions with longer duration, multidisciplinary input and stronger health system integration may yield more substantial and sustained improvements in both clinical outcomes and quality of life.

Conclusion

The family-centred education and training programme improved diabetes knowledge and self-care confidence among adults with type 2 DM and their families in Tasikmalaya, although the increase in knowledge was modest and not

statistically significant. Baseline QoL was poor, especially in the physical domain. Longer-term interventions with continuous follow-up and psychosocial components are recommended to achieve sustainable improvements in QoL and clinical outcomes.

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