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## The effect of health education videos on healthy lifestyle knowledge among patients with diabetes mellitus

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### Abstract

**Introduction:** Diabetes mellitus (DM) is a chronic disease that requires continuous self-management through healthy dietary practices, regular physical activity, medication adherence, and blood glucose monitoring. Adequate knowledge is an important foundation for enabling patients to understand and apply appropriate disease-management practices. Health education using video media may provide an accessible approach to delivering information through visual and auditory components.

**Purpose:** To determine the effect of video-based health education on knowledge of healthy lifestyle behaviours among patients with diabetes mellitus.

**Method:** This quantitative study used a quasi-experimental design with a one-group pretest-posttest approach. The study included 98 patients with diabetes mellitus selected using purposive sampling. Knowledge was measured before the intervention (pretest), followed by health education delivered through video media and a posttest measurement. Data were analyzed using the Wilcoxon Signed-Rank Test.

**Results:** The mean knowledge score increased from  $1.96 \pm 0.731$  before the intervention to  $2.93 \pm 0.259$  after video-based health education, with a mean difference of 0.97 points. The Wilcoxon Signed-Rank Test demonstrated a statistically significant difference between pretest and posttest knowledge scores ( $Z = -7.495$ ,  $p = 0.001$ ).

**Conclusion:** Video-based health education was associated with a significant improvement in knowledge regarding healthy lifestyle behaviours among patients with diabetes mellitus. Video media may be considered an accessible educational approach for supporting diabetes-related health knowledge in primary healthcare settings.

**Keywords:** Diabetes Mellitus; Health Education; Healthy Lifestyle; Knowledge; Video Media.

### INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disease characterized by elevated blood glucose levels resulting from impaired insulin production, impaired insulin action, or a combination of both. Persistent hyperglycaemia can lead to serious complications, including cardiovascular disease, stroke, kidney failure, neuropathy, retinopathy, and premature death when inadequately managed (World Health Organization, 2024). Living with DM requires continuous self-management and adaptation to long-term health demands. Disease management involves

not only pharmacological treatment but also healthy dietary practices, regular physical activity, medication adherence, and routine blood glucose monitoring. These behaviours require adequate understanding, self-regulation, and the ability to make appropriate health decisions in daily life. Health knowledge therefore represents an important foundation for supporting patients' capacity to manage their condition independently and maintain healthy behaviours. Insufficient knowledge may hinder patients from understanding disease-management

recommendations and consistently incorporating them into everyday routines. Diabetes self-management education and support are recognized as important components of diabetes care because they provide patients with knowledge and skills needed to manage their condition and make informed decisions regarding daily self-care (Davis, Fischl, Beck, Browning, Carter, Condon, & Villalobos, 2022).

In Indonesia, DM continues to represent an important public health concern. The 2023 Indonesia Health Survey reported several lifestyle-related concerns relevant to the prevention and management of noncommunicable diseases, including insufficient physical activity, obesity, and unhealthy dietary practices (Ministry of Health of the Republic of Indonesia, 2023). The Indonesia Health Profile 2023 also demonstrates the continuing importance of strengthening health services and disease prevention efforts related to noncommunicable diseases (Ministry of Health of the Republic of Indonesia, 2024). These conditions highlight the need to strengthen promotive and preventive strategies through accessible health education that can improve patients' understanding and support the adoption of healthy behaviours in daily life. In the working area of the present study, health center records in 2026 documented 1,441 cases of DM during the preceding three months. A preliminary survey conducted by the researchers in March 2026 among 10 patients with DM found that 7 respondents (70%) did not follow recommended dietary practices, 6 (60%) rarely engaged in physical activity, 8 (80%) did not routinely monitor their blood glucose levels, and 7 (70%) demonstrated limited understanding of DM management. These findings indicate a need for educational interventions that can strengthen patients' understanding of disease management and healthy living practices. The case data and preliminary survey findings were also documented in the undergraduate thesis as the basis for identifying the research problem.

Health education delivered through audiovisual media may provide an accessible approach to strengthening patients' understanding of chronic disease management. Video combines visual information, audio, text, and demonstrations, allowing health information to be presented in a structured and engaging manner. The ability to replay educational content may also allow patients to review information that they have not fully understood. In the present

study, the educational video covered the definition of DM, risk factors, signs and symptoms, dietary management, physical activity, medication, and blood glucose monitoring. The educational media were developed using the 4D development model and underwent media development and testing procedures (Sofian & Karjatin, 2025). Previous studies have reported the potential of video-based education to improve diabetes-related knowledge and self-management. Video-based educational media have been reported to improve knowledge among patients with type 2 DM, including when compared with leaflet-based education (Anggraeni, Novaria, Utami, & Wiryanto, 2024). Video-based Diabetes Self-Management Education delivered through telenursing has also been reported to improve patients' diabetes-related knowledge (Harahap, Muhith, Asih, & Hasina, 2025). Similarly, video-based dietary education has been associated with improvements in knowledge and dietary-management skills among patients with type 2 DM (Dewi & Maria, 2023). A systematic review of diabetes patient education further identified videos as a potentially useful medium for delivering diabetes-related information and supporting patient education (Hoe, Ahmad, & Watterson, 2024). Evidence from broader diabetes self-management education research also indicates that structured educational interventions can improve knowledge, self-management behaviours, and related outcomes among people with type 2 DM (Tanaka, Shibayama, Sugimoto, & Hidaka, 2020; Riangkam, Ruksakulpiwat, Jariyasakulwong, Panichpathom, & Phianhasin, 2024).

Nevertheless, previous studies have addressed different outcomes, including comparisons between video and leaflet media, diabetes self-management, dietary-management skills, and the development of educational media. Other studies have examined broader approaches, such as mobile health education, online self-management interventions, and patient activation programmes (Almutairi, Hosseinzadeh, & Gopaldasani, 2020; Celik, Forde, & Sturt, 2020; Guo, Lin, Hsing, Lee, & Chuang, 2023). Evidence specifically examining the effect of structured video-based health education on healthy-lifestyle knowledge among patients with DM in primary healthcare settings, particularly in the working area of the present study, remains limited. This gap provides a rationale for evaluating whether structured

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video-based education can improve patients' knowledge regarding healthy living and DM management.

## RESEARCH METHOD

This study employed a quantitative approach with a quasi-experimental one-group pretest-posttest design. The study was conducted at Way Kandis Community Health Center, Bandar Lampung, Indonesia, from June 10 to July 9, 2026. The study population comprised patients with Diabetes Mellitus (DM) registered at Way Kandis Community Health Center. A total of 98 respondents were recruited using purposive sampling based on predetermined inclusion and exclusion criteria. The inclusion criteria were patients with DM who were able to communicate effectively, were willing to participate in the study, and provided informed consent. Respondents who were unable to complete the questionnaire or participate in the educational intervention were excluded.

The independent variable was health education delivered through video, while the dependent variable was healthy-lifestyle knowledge among patients with DM. Knowledge was assessed using a 23-item questionnaire covering the definition of DM, risk factors, signs and symptoms, complications, healthy dietary practices, physical activity, blood glucose monitoring, and DM management. Each item had one correct answer and was scored 1 for a correct response and 0 for an incorrect response. The item scores were summed to obtain a raw knowledge score ranging from 0 to 23, with higher scores indicating greater knowledge. For statistical analysis, the raw total score was transformed into a three-level knowledge score coded as 1 = low knowledge, 2 = moderate knowledge, and 3 = high knowledge. The same scoring and transformation procedures were applied to the pretest and posttest. The reported means of 1.96 and 2.93 therefore represent the transformed three-level knowledge scores rather than the raw 23-item scores. Information on formal validity and reliability testing of the questionnaire was not available in the study documentation; therefore, no validity or reliability coefficients were reported.

The educational video provided information related to the definition of DM, risk factors, signs and

symptoms, healthy dietary practices, physical activity, medication management, and blood glucose monitoring. Data collection began with an explanation of the study objectives, procedures, potential benefits, and participants' rights, followed by the provision of informed consent. Respondents subsequently completed the pretest using the 23-item knowledge questionnaire. The video-based health education was then delivered according to the prepared educational material. After completion of the intervention, respondents completed the posttest using the same questionnaire and scoring procedure to assess changes in healthy-lifestyle knowledge.

Data were analyzed using univariate and bivariate analyses. Univariate analysis was used to describe respondent characteristics and the distribution of healthy-lifestyle knowledge scores before and after the intervention. The normality of the pretest and posttest scores was assessed using the Shapiro-Wilk test. As the knowledge scores were not normally distributed, the difference between pretest and posttest scores was analyzed using the Wilcoxon Signed-Rank Test. The results were reported using the Wilcoxon test statistic (Z) and p-value. Statistical significance was determined at  $\alpha = 0.05$ , with  $p < 0.05$  considered statistically significant.

The study was conducted in accordance with applicable research ethics principles. Before participation, all respondents received information regarding the study objectives, procedures, potential benefits, and their rights as participants and provided informed consent. Participation was voluntary, and respondents were informed of their right to refuse participation or withdraw from the study without consequences. Respondent anonymity and confidentiality were maintained throughout data collection, data processing, analysis, and reporting. The research procedures were conducted with consideration of the principles of respect for participants, beneficence, non-maleficence, and confidentiality. Research permission was obtained before data collection, and the study was conducted in accordance with the applicable institutional and ethical requirements.

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## RESEARCH RESULTS

Table 1. Characteristics of Respondents (N=98)

| Variable                                  | Results                 |
|-------------------------------------------|-------------------------|
| <b>Age (n/%) (Mean±SD) (Range) (Year)</b> | (50.85 ± 10.57) (32-69) |
| 32-47                                     | 42/42.9                 |
| 48-55                                     | 16/16.3                 |
| 56-69                                     | 40/40.8                 |
| <b>Gender (n/%)</b>                       |                         |
| Male                                      | 49/50.0                 |
| Female                                    | 49/50.0                 |
| <b>Education (n/%)</b>                    |                         |
| Junior High School                        | 49/50.0                 |
| Senior High School                        | 49/50.0                 |
| <b>Duration of DM (n/%)</b>               |                         |
| 1 Years                                   | 45/45.9                 |
| 2 Years                                   | 53/54.1                 |

Table 1 shows that among the 98 respondents, had a mean age of  $50.85 \pm 10.57$  years, with an age range of 32–69 years. 42 (42.9%) were aged 32–47 years, followed by 40 (40.8%) aged 56–69 years and 16 (16.3%) aged 48–55 years. The distribution by sex was equal, with 49 respondents (50.0%) being male and 49 (50.0%) being female. Regarding education, 49 respondents (50.0%) had completed elementary school and 49 (50.0%) had completed junior high school. More than half of the respondents had been living with DM for 2 years (53; 54.1%), while 45 (45.9%) had been living with DM for 1 year.

Table 2. Healthy-Lifestyle Knowledge Scores Before and After Health Education

| Measurement | Minimum | Maximum | Mean | SD    |
|-------------|---------|---------|------|-------|
| Pretest     | 1       | 3       | 1.96 | 0.731 |
| Posttest    | 2       | 3       | 2.93 | 0.259 |

Table 2 shows that the mean healthy-lifestyle knowledge score before the intervention was  $1.96 \pm 0.731$ , with scores ranging from 1 to 3. Following the video-based health education intervention, the mean knowledge score increased to  $2.93 \pm 0.259$ , with scores ranging from 2 to 3. These values represent the three-level transformed knowledge scores derived from the 23-item questionnaire, rather than the raw questionnaire scores.

Table 3. Normality Test Results

| Measurement | Shapiro–Wilk Statistic | df | P-Value |
|-------------|------------------------|----|---------|
| Pretest     | 0.809                  | 98 | <0.001  |
| Posttest    | 0.809                  | 98 | <0.001  |

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Table 3 shows that the Shapiro–Wilk test yielded  $p < 0.001$  for both pretest and posttest scores. Therefore, the data were not normally distributed. Based on these results, the Wilcoxon Signed-Rank Test was used to compare knowledge scores before and after the intervention.

**Table 4. Comparison of Healthy-Lifestyle Knowledge Scores Before and After Video-Based Health Education**

| Measurement | Mean | Mean Difference | Range | SD    | Z      | P-value |
|-------------|------|-----------------|-------|-------|--------|---------|
| Pretest     | 1.96 | 0.97            | 1-3   | 0.731 | -7.495 | 0.001   |
| Posttest    | 2.93 |                 | 2-3   | 0.259 |        |         |

Table 4 shows an increase in the mean healthy-lifestyle knowledge score from  $1.96 \pm 0.731$  before the intervention to  $2.93 \pm 0.259$  after the intervention, representing a mean increase of 0.97 points. The Wilcoxon Signed-Rank Test demonstrated a statistically significant difference in knowledge scores between the pretest and posttest ( $Z = -7.495$ ,  $p = 0.001$ ). These findings indicate that healthy-lifestyle knowledge increased significantly following the video-based health education intervention.

## DISCUSSION

The findings showed that the respondents were predominantly aged 32–47 years (42.9%), followed by those aged 56–69 years (40.8%). This distribution indicates that the study population included both middle-aged and older adults with DM. Increasing age is an important characteristic associated with the development and management of type 2 DM, while diabetes care requires continuous attention to lifestyle, medication, monitoring, and other self-management practices (American Diabetes Association Primary Care Advisory Group, 2026). The predominance of middle-aged and older respondents is relevant to chronic disease self-management because long-term management requires continuous adaptation of dietary practices, physical activity, medication use, and blood glucose monitoring. However, the present study did not examine age as a predictor of knowledge or other outcomes. Therefore, the age distribution should be interpreted as a characteristic of the study population rather than as evidence that age directly caused DM.

The distribution by sex was balanced, with 49 male (50.0%) and 49 female (50.0%) respondents. This finding indicates that both men and women were equally represented in the study population. The

balanced distribution supports the relevance of diabetes education for both male and female patients according to their individual health needs. Diabetes self-management education is intended to provide individuals with the knowledge and skills required to participate actively in diabetes care, regardless of sex (Davis, Fischl, Beck, Browning, Carter, Condon, & Villalobos, 2022). Nevertheless, because this study did not examine differences in intervention responses according to sex, no conclusion can be drawn regarding whether sex influenced the observed change in knowledge.

Regarding education, 49 respondents (50.0%) had completed junior high school and 49 (50.0%) had completed senior high school. Thus, the respondents were equally distributed between junior-high-school and senior-high-school educational backgrounds. Educational attainment may influence the ability to access, understand, evaluate, and apply health information. Evidence from a systematic review indicates that health literacy interventions can improve diabetes-related self-management outcomes and glycaemic control, highlighting the importance of accessible health information for people with type 2 DM (Butayeva, Ratan, Downie, & Hosseinzadeh, 2023).

This characteristic is relevant to the selection of educational media. Patients with different educational backgrounds may benefit from information presented using clear language, visual explanations, and concrete examples. Video-based education combines auditory and visual information and may therefore facilitate the presentation of health information involving several behavioural components, such as dietary management, physical activity, medication use, and blood glucose monitoring. Previous research has demonstrated the potential of video-based

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education to improve diabetes-related knowledge and skills (Anggraeni, Novaria, Utami, & Wiryanto, 2024; Dewi & Maria, 2023). However, the present study did not statistically examine educational attainment as a determinant of knowledge improvement. Therefore, education level should be interpreted as a contextual characteristic of the respondents rather than as a demonstrated predictor of the observed change.

More than half of the respondents had been living with DM for 2 years (54.1%), while 45.9% had been diagnosed for 1 year. A longer duration of illness may provide patients with greater exposure to treatment and disease-management experiences. However, experience with illness does not necessarily indicate adequate knowledge or appropriate self-management. Evidence from diabetes self-management education research indicates that structured education remains relevant for supporting knowledge, self-care skills, and behavioural management among people with type 2 DM (Tanaka, Shibayama, Sugimoto, & Hidaka, 2020). Patient activation interventions have also been examined as an approach to strengthening self-management behaviours and glycaemic control, indicating that previous experience with diabetes does not necessarily eliminate the need for structured support (Almutairi, Hosseinzadeh, & Gopaldasani, 2020).

From a chronic disease and psychosocial perspective, this finding suggests that education remains relevant even among patients who have lived with DM for several years. Continuous education can reinforce existing knowledge, address misconceptions, and support patients in adapting health recommendations to their daily routines. Diabetes self-management education and support are designed to help patients acquire and maintain the knowledge and skills necessary for effective self-care (Davis, Fischl, Beck, Browning, Carter, Condon, & Villalobos, 2022). Thus, disease duration should not be considered a substitute for structured health education.

Before the intervention, the mean transformed healthy-lifestyle knowledge score was  $1.96 \pm 0.731$ , with scores ranging from 1 to 3. The questionnaire consisted of 23 items, with each correct response scored 1 and each incorrect response scored 0. The resulting raw score was subsequently transformed into a three-level knowledge score coded as 1 = low, 2 = moderate, and 3 = high. Therefore, the reported

mean of 1.96 represents the transformed knowledge score rather than the raw score from the 23-item questionnaire. The baseline finding indicates that the respondents' knowledge was distributed across the low-to-high categories, with the average falling within the moderate category based on the study's scoring system. The areas addressed by the questionnaire included dietary management, physical activity, medication, blood glucose monitoring, and other aspects of DM management. Previous studies have demonstrated the potential for improvement in diabetes-related knowledge and self-management skills following structured educational interventions (Dewi & Maria, 2023; Harahap, Muhith, Asih, & Hasina, 2025). Systematic reviews have also demonstrated the relevance of structured education, health literacy interventions, and patient-centred self-management support in improving diabetes-related outcomes (Butayeva, Ratan, Downie, & Hosseinzadeh, 2023; Tanaka, Shibayama, Sugimoto, & Hidaka, 2020).

Knowledge is an important component of health behaviour because it provides individuals with information needed to understand health risks and evaluate recommended actions. Within the PRECEDE-PROCEED framework, knowledge can function as a predisposing factor that contributes to health behaviour. In patients with chronic illness, adequate knowledge may therefore support informed decision-making and participation in self-management. The baseline findings are also relevant to the process of adapting to a chronic illness because patients need to understand why specific behaviours are recommended and how these behaviours can be incorporated into daily routines. However, knowledge alone does not guarantee behavioural change because self-management is also influenced by motivation, social support, access to healthcare, perceived barriers, and individual circumstances. Therefore, the present study should interpret baseline knowledge as one modifiable component of chronic disease management rather than as the sole determinant of healthy behaviour.

Following video-based health education, the mean transformed knowledge score increased from  $1.96 \pm 0.731$  to  $2.93 \pm 0.259$ , with posttest scores ranging from 2 to 3. This finding indicates an improvement in the respondents' knowledge scores following exposure to the educational video. The smaller

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standard deviation at posttest also indicates less variability in the transformed scores after the intervention. The finding is consistent with previous evidence supporting video-based education as a means of improving diabetes-related knowledge and supporting self-management. Studies of video-based educational interventions have reported improvements in diabetes knowledge, dietary-management skills, and self-management-related outcomes (Anggraeni, Novaria, Utami, & Wiryanto, 2024; Dewi & Maria, 2023; Harahap, Muhith, Asih, & Hasina, 2025). A systematic review of video use in diabetes patient education also supports the potential role of video as an educational medium for people with diabetes (Hoe, Ahmad, & Watterson, 2024).

The potential benefit of video-based education can be explained by its ability to combine visual and auditory information. Video can present health information in a structured manner and demonstrate behaviours that may be difficult to explain through written information alone. Patients may also review the material, providing additional opportunities to process and recall information. These characteristics may be relevant to the present study population, which consisted of respondents with junior-high-school and senior-high-school educational backgrounds. The video presented information using visual and auditory components concerning diet, physical activity, medication, and blood glucose monitoring. Such presentation may make complex information more accessible and provide respondents with concrete examples that can be recalled after the educational session. The use of videos for diabetes education has been identified as a potentially useful approach for presenting information and supporting patient learning (Hoe, Ahmad, & Watterson, 2024).

The findings can also be considered within the broader evidence on digital and technology-supported diabetes education. Mobile eHealth education has been shown to have potential for improving diabetes knowledge, self-care, skills, and eHealth literacy, while online self-management interventions have also been investigated as approaches to supporting people with type 2 DM (Guo, Lin, Hsing, Lee, & Chuang, 2023; Celik, Forde, & Sturt, 2020). These findings suggest that technology-supported education can provide additional opportunities for patients to access and review disease-management information. However, the present intervention was specifically

delivered through video-based health education, and the findings should therefore be interpreted in relation to the educational video rather than to digital health interventions generally.

The Shapiro–Wilk test showed that both pretest and posttest scores were not normally distributed ( $p < 0.001$ ). Therefore, the Wilcoxon Signed-Rank Test was used to examine the difference between paired pretest and posttest scores. The analysis demonstrated a statistically significant difference between the two measurements ( $Z = -7.495$ ,  $p = 0.001$ ). The transformed mean score increased by 0.97 points, from 1.96 before the intervention to 2.93 after the intervention. This finding is consistent with previous evidence supporting structured diabetes education as an approach to improving disease-related knowledge and self-management (Tanaka, Shibayama, Sugimoto, & Hidaka, 2020; Riangkam, Ruksakulpiwat, Jariyasakulwong, Panichpathom, & Phianhasin, 2024). Video-based education may facilitate learning by allowing patients to simultaneously receive explanations and observe visual representations of recommended behaviours (Hoe, Ahmad, & Watterson, 2024).

The statistically significant pretest-posttest difference indicates that respondents' knowledge scores changed following the educational session. However, the result should be interpreted as a change in knowledge scores rather than definitive evidence that the video independently caused the improvement. The one-group pretest-posttest design does not include a comparison group, and therefore other factors that occurred during the study period cannot be completely excluded. In addition, repeated exposure to the same questionnaire may have contributed to changes in posttest responses.

From a health behaviour perspective, increased knowledge may provide an important foundation for subsequent self-management. Diabetes self-management education and support emphasize the acquisition of knowledge and practical skills that enable patients to participate actively in their own care (Davis, Fischl, Beck, Browning, Carter, Condon, & Villalobos, 2022). Nevertheless, increased knowledge should not automatically be interpreted as evidence of sustained behavioural change. The present study measured knowledge immediately before and after the intervention and did not assess long-term retention, actual lifestyle behaviour, glycaemic

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control, self-efficacy, psychological well-being, or quality of life. Therefore, the observed improvement primarily reflects a short-term change in transformed knowledge scores following exposure to the educational intervention.

The relevance of this finding to mental health lies primarily in the broader process of adapting to chronic illness rather than in a demonstrated change in mental health status. Effective chronic disease education may support patients' understanding of their condition and their ability to participate in self-management. Greater understanding may potentially facilitate adaptation to daily disease-management demands. However, because this study did not measure anxiety, depression, stress, self-efficacy, coping, psychological well-being, or quality of life, the findings cannot establish that video-based education improved mental health outcomes.

The findings should also be interpreted in light of the measurement procedure. The 23-item questionnaire generated a raw score of 0–23 based on correct and incorrect responses, which was subsequently transformed into a three-level score of 1–3 for analysis. Consequently, the reported means and mean difference represent changes in the transformed score and should not be interpreted as changes in the number of correctly answered questionnaire items. In addition, formal validity and reliability coefficients for the questionnaire were not available in the study documentation. Therefore, the measurement findings should be interpreted with appropriate caution, and future studies should document the instrument's validity and reliability before wider application.

Despite these limitations, the increase in the transformed knowledge score provides evidence of a pretest-posttest improvement following the video-based educational session. The audiovisual format may be useful for delivering structured information on diet, physical activity, medication, and blood glucose monitoring in primary healthcare settings. In the context of chronic disease care, structured education can be incorporated into routine services as part of ongoing patient support and diabetes self-management education (Davis, Fischl, Beck, Browning, Carter, Condon, & Villalobos, 2022).

Overall, the findings indicate that healthy-lifestyle knowledge scores increased significantly following video-based health education among patients with

DM. The findings support the potential use of video as an educational medium for strengthening knowledge related to diabetes self-management. Further studies using controlled designs, validated and reliable measurement instruments, and longer follow-up periods are needed to determine whether improvements in knowledge are maintained and translated into sustained self-management behaviours, self-efficacy, glycaemic control, quality of life, or other psychosocial outcomes.

## CONCLUSION

Video-based health education was followed by a statistically significant improvement in healthy-lifestyle knowledge scores among patients with Diabetes Mellitus. The mean transformed knowledge score increased from  $1.96 \pm 0.731$  before the intervention to  $2.93 \pm 0.259$  after the intervention, with a mean difference of 0.97 points. The Wilcoxon Signed-Rank Test demonstrated a statistically significant difference between the pretest and posttest scores ( $Z = -7.495$ ,  $p = 0.001$ ). These findings indicate that video-based health education may be a useful educational approach for strengthening knowledge related to healthy-lifestyle practices and diabetes self-management in primary healthcare settings. However, because the study used a one-group pretest-posttest design and assessed knowledge only immediately before and after the intervention, the findings should not be interpreted as evidence of long-term behavioural or mental health effects.

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